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Rethinking Dissociation in an Age of Virtual Worlds

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1. Introduction

My previous research sought to address the general question of whether the use of virtual worlds and video games may induce experiences that fit the language used to describe dissociative disorders. The method of investigation was the development of a survey instrument based on the Structured Clinical Interview for Depersonalization – Derealization Spectrum (Mula et al., 2008). The new survey was in turn administered to a population of users of the virtual world *Second Life*. While results from this initial study provided some provisional insights the question that motivated this research remains worthy of further attention. In fact this question was originally arose from a consideration of a more general question: how do we distinguish what is real from what is virtual? From this initial question it is possible to tease out a number of questions deserving of further investigation.

A significant number of people spend a significant amount of time using virtual worlds for gaming and entertainment. According to the market research company KZERO WORLD-WIDE (<http://www.kzero.co.uk/>) the cumulative total of registered accounts for virtual worlds, MMOs (massive multi-player online games) and social gaming stands at 1.92 billion. The Entertainment Software Association (<http://www.theesa.com/facts/index.asp>) reports that 72 percent of American households play computer or video games. According to the Pew Research Center 97 percent of teens in the United States play videogames of some sort. (Pew Research Center 2008).

Edward Castronova argues that virtual worlds and games attract our attention because they offer more positive experiences than the real world. This places the real and the virtual in competition for people's time and attention. Castronova invokes simple economic theory to claim, that "the real world is going to lose." (Castronova 2008). With Castronova's exodus people are "moving their attention, not their bodies, and they are moving back and forth all the time."

If Castronova is right and the data on the growing numbers of users of games and virtual worlds appear to support his speculations, then we need to understand how is it that people “are moving back and forth all the time” but manage not to confuse the real and the virtual. We need to understand why and how “reality testing is intact” as people migrate back and forth from the real to the virtual.

The use of virtual worlds is no longer an activity at the margins of society. It is now a part of the cultural fabric. Yet we have a poor understanding of the impact of this activity on the psychological well being of players. More to the point we do not understand how human beings sort out the differences between virtual experiences and real life experiences. How is it that most people easily recognize and separate these two domains of experience?

In the near future this ability will be challenged. Rapid advances in wearable computing (compact computational and sensing devices molded to comfortably fit the human body) have introduced new viewing devices that promise to further blur the lines between the real and the virtual. Announced in April 2012 Google’s Project Glass introduces augmented reality eyewear that offers anywhere, anytime connectivity (Hill 2012). The display visible with the eyewear merges together a view of the real world with the overlay of the capabilities of web browsers and smartphones.

The *Rift Project* developed by Oculus will introduce Virtual Reality goggles in early 2013 that feature an extremely high resolution display with head motion tracking for the home market for games. As video gaming experiences become increasingly realistic, engaging and immersive how will users/players distinguish real experiences from virtual experiences? What of their long-term memories of these experiences? Will those memories of virtual experiences intermingle with memories of “real” experiences? What of dreams? Anecdotal accounts suggest that players do have dreams about gaming experiences.

With augmented reality the distinction between the real and the virtual collapses and becomes a single unified experience. A person viewing the Grand Canyon through augmented reality glasses might see text overlay identifying prominent features of that landscape. It seems quite unlikely that someone might confuse this text overlay as part of the observed reality as they can simply take off the glasses and view the natural world as it is. But what if that overlay includes a video conferencing feature similar to Skype? The individual sees a Park Ranger (who is not physically there) and hears the voice of the Ranger through their ear buds (headphones built into the glasses). The Park Ranger responds to questions, gestures to geological features in the environment (much like the weather man or woman against a green screen), engages in conversation and can even make eye contact.

For all intents and purposes this experience is real, feels real to the viewer and will be remembered just as vividly (perhaps even more so?) as the experience of talking to a person standing next to him or her on the South Rim. What is substantively different about this experience is that it is a broadband, information rich, real time interaction. This experience completely engages the participant in the visual, auditory domains and more importantly in the realm of human social affairs.

A determined materialist might argue that this is simply a pseudo question and concern. We know the physics and electrical engineering of how the bits and bytes are represented as electrical impulses and stored on a hard drive. The engineering is well established for how the data is read, parsed into instructions and the algorithms are executed, while user input is processed resulting in the real time display of 3D computer graphics along with the playback of stereo sound. We know a great deal about the systems of visual and auditory processing, from the anatomy of the eye and ear to the neural correlates in the brain. The reductionist can confidently say that we objectively know what is out there, is real. We thoroughly understand the science and engineering of how the virtual worlds are generated. The light from a pattern of pixels that hits the retina is just as “real” as light coming from the “real” or natural world. We even understand a great deal about perception, both how the brain creates the world out there from sensory inputs to even how the brain processes illusions.

But that is not the point. This reductionist argument is like trying to explain the experience of reading a novel by describing the technology of papermaking, publishing and printing. The real question centers on that human capacity to imagine fictitious worlds when hearing or reading stories or watching a play or film or playing a game.

What is happening when we experience the “suspension of disbelief”? What is this capacity to simultaneously know that the experience (reading fiction, watching a play or movie) is not real but still responding as if it were real? When dreaming one’s motor control is suppressed. When we read a book, watch a play or film we remain seated. When we play a video game we interact within the constraints defined by the interface. Historically game interaction has been accomplished by use of a mouse and keyboard, or with the buttons on a game controller. More recently motion tracking and motion sensing technologies motion used with the Wii or Microsoft Kinect make it possible to interact using one’s whole body.

There is also the temptation to dismiss this as a topic best suited for an introductory class in philosophy. After all the question of what is the reality of the virtual is an epistemological one. Yet this does not mean that such questions have to be abandoned and left to metaphysics. Testing a series of questions and gathering data using quantitative and qualitative methods can provide meaningful results. To return to the question suggested at the onset of this chapter, does the language used to describe the diagnostic criteria for dissociative disorders specifically from the *Diagnostic and Statistical Manual of Mental Disorders: Fourth Edition, Text Revision* (2000), apply to experience of using virtual worlds or playing games?

In the DSM-IV-TR dissociative disorders are described as the “disruption in the usually integrated functions of consciousness, memory, identity, or perception of the environment” and “partial or complete loss of the normal integration between memories of the past, awareness of identity and immediate sensations, and control of bodily movements.” Why is it that frequent migrations between the real and virtual do not trigger a “disruption in the usually integrated functions...”? If a subject presents symptoms of dissociation in real life do these symptoms carry over or are aggravated by use of a virtual world like *Second Life* (<http://secondlife.com/>)?

The DSM-IV-TR acknowledges that dissociative states “occur frequently and are not inherently pathological” and are even “sought-after experiences as part of long standing religious and cultural rituals and practices.” Many conditions present similar clusters of symptoms, yet the language used in the DSM for the diagnostic criteria for depersonalization and derealization is a fitting description for how avatars (the user’s onscreen representation in a virtual world or game) look “unreal” and one’s surroundings looks “unreal” in a virtual worlds like the *SIMS*, *The World of Warcraft* or *Second Life*. These virtual worlds are all computer generated 3D computer graphics simulations that in spite of considerable advances in real time rendering fall well short of photo-realism and still look fake and cartoonish.

The DSM-IV-TR uses the following criteria for derealization: “The perception or experience of the external world so that it seems strange or unreal; Feeling as though one’s environment is lacking in spontaneity, emotional colouring and depth.” In *Second Life* the objects, architecture and avatars representing other residents appear “strange and unreal” and are “lacking in spontaneity, emotional coloring (especially other avatars) and depth.”

The diagnostic criteria for Item 300.6 Depersonalization Disorder specifies the following: “Persistent or recurrent feelings of being detached from one’s mental processes or body; as if an observer; During depersonalization, reality testing is intact.” In *Second Life* users see their avatars from a default point-of-view (POV) slightly above and behind their “in world” avatar. This is not unlike descriptions of out-of-body experiences. Users can also use a viewing technique called mouse-look which makes it possible for a user to view his or her own avatar as if it were someone else. Avatars controlled by other users can “seem unfamiliar or mechanical” or “robotic”.

Updated in DSM-IV-TR, Dissociative Identity Disorder (DID) refers to the “presence of two or more distinct identities or personality states” that “recurrently take control” of a person’s behavior. It is a common practice for *Second Life* users to have multiple “in-world” avatars (known as alts) that can be of a different gender. The user effectively takes on a different personality and behavior when employing a different avatar.

2. A Survey and results

It is an informal observation to say that the language of the diagnostic criteria of the DSM is an apt description of the experience using a virtual world like *Second Life*. To say that a computer generated simulation of a world looks “strange, unreal” or that the avatars in that virtual world “seem unfamiliar or mechanical” or “robotic” is a matter-of-fact statement. Similarly asserting that for most users and players “reality testing is intact” is likewise an uncontroversial truism.

To suggest that users and players who have multiple avatars may experience something akin to dissociative identity disorder is another matter. These terms and phrases have real import when used as part of the diagnostic criteria for dissociative disorders. If users self-report and respond in the affirmative to a self-administered questionnaire related to the di-

agnostic criteria then there may be something worth further scrutiny. In order to conduct a more systematic investigation the development of a survey instrument and its deployment was required.

The Structured Clinical Interview for Depersonalization – Derealization Spectrum (SCI-DER) (Mula et al., 2008) was chosen as a model for a new survey. Questions were selected on the basis of how well they applied to the experience of using *Second Life*. Those questions that referenced situations that could only be experienced in “real life” were not used. Some questions were used as is or were minimally rewritten to clearly reference the experience of using *Second Life*. This newly created survey instrument was administered to a select population of users of *Second Life*. A parsimonious interpretation of the initial results, suggest that a significant number of survey respondents agreed that the descriptions of dissociative experiences based on the diagnostic criteria of the DSM-IV-TR do apply to the experience of using virtual worlds.

The SCI-DER introduces the survey questions with this general question: “Have you ever experienced just for a few seconds or for days or months. ...” After that each of the specific questions follow such as the first: ... *that the outside world was strange and unreal?*

This preface from the SCI_DER is rewritten for the new survey as: “While in Second Life have you ever experienced just for a few seconds or for a longer period of time...” The first question is modified as follows to refer directly to the experience of being logged into *Second Life*.

...that the virtual world was strange and unreal?”

Questions were added that addressed gender, age and length of time spent as a registered user (resident) of Second Life. In the end the new survey instrument comprised a total of 23 questions. Respondents answered Yes or No to each. While the SCI-DER is considered a validated instrument with high reliability, this new survey does not make any such claims. Additionally this new survey was not intended to be used for the purposes of diagnosis. The survey was administered by the Social Research Foundation (<http://www.socialresearchfoundation.org/>) to a sample population of 110 “residents” of Second Life. Respondents completed the survey online anonymously. The following charts show sample results of this new survey using questions modified from the SCI-DER. As noted above the list of twenty-three questions is prefaced by this general question:

*While in Second Life have you ever experienced just for a few seconds or for a longer period of time...
 ...that the virtual world was strange and unreal?*

Question 1 uses the descriptive phrase directly from the diagnostic criteria of the DSM-IV-TR and corresponds to the first domain of questions in the SCI-DER. Items in this domain focus on derealization or “referring to an altered experience of the external world (Mula et al., 2008).” Question 2 is another example of this domain. Survey responses suggest that it is “normal” and expected to view other avatars and objects as “not real” when logged into *Second Life*. Indeed it is likely a desirable and sought after experience whereas to experience the “real” world as “strange and unreal” is disturbing and potentially disabling.

... having the feeling that other avatars, objects, and the 'in-world' environment around you were not real?

Question 12 references the *Somatopsychic depersonalization* domain which “describes a variety of changes in body experience such as lack of body ownership feelings, feelings of disembodiment, which can range from a nonspecific feeling of not being in the body to out-of-body experiences and autoscopic hallucinations (Mula et al., 2008).”

... that you were not in charge of your avatar's movements, so that you felt “automatic” and mechanical as if you were a robot?

Questions 17 and 18 reference the third domain of Auto Psychic depersonalization which includes “unfamiliarity of the self in terms of sensation of being an outside observer of one's mental process, not being ‘in charge’ of their own behavior or mental processes, the automaton-line experience and anomalous subjective recall.” Yes responses are not surprising given that the default viewpoint in *Second Life* is from a vantage point slightly above and behind their “in-world” avatar. In fact residents often use *Mouse Look* (Second Life Wikia, n.d.) where it is possible to move the camera representing their avatar's point-of-view, independent of the location of their avatar. This makes it possible to observe their own avatar as if they were “detached from one's body;” as if “an observer.”

... that you were a “detached observer”?

Question 18 references the déjà vu experience. Sims (simulations) in *Second Life* have a sameness to them because of the basic technology consists of complex shapes built out of primitive shapes with simple texture maps. Question 18 also references item 300.13 Dissociative Fugue in the DSM-IV-TR where the “predominant disturbance is sudden, unexpected travel away from home or one's customary place of work, with inability to recall one's past.”

... that when in a new situation, you had been there before?

Question 23 references the DSM-IV-TR category 300.14 *Dissociative Identity Disorder*. Male and female responses differ by only 1.5 percentage points. These results suggest that nearly half of the population of residents use “alts” or alternative avatars that have “distinct personalities.” It is not clear from these responses if these personalities take control but most *Second Life* users enact or “perform” their avatar in a way consistent with its appearance. Item 300.14 Dissociative Fugue is also implicated here as it involves “Confusion about personal identity, or the assumption of a new identity, (partial or complete).”

... that you use two or more distinct avatars having different personalities?

Some value lies in this survey's potential to define and recognize potential manifestations that (weakly) correlate to DSM-IV diagnostic criteria. This has led to further research questions (as noted above) that suggest the development of new instruments and methodologies.

3. Other considerations

Digital games conjure up virtual worlds by means of graphical displays. Play further establishes the divide between the real and the virtual by demarcating what play theorists call the magic circle. First described by Huizinga in his seminal work on play (1955) the magic circle is a place set apart for not only play but also much more:

"All play moves and has its being within a play-ground marked off beforehand either materially or ideally, deliberately or as a matter of course. Just as there is no formal difference between play and ritual, so the 'consecrated spot' cannot be formally distinguished from the play-ground. The arena, the card-table, the magic circle, the temple, the stage, the screen, the tennis court, the court of justice, etc., are all in form and function play-grounds, i.e. forbidden spots, isolated, hedged round, hallowed, within which special rules obtain. All are temporary worlds within the ordinary world, dedicated to the performance of an act apart."

Gregory Bateson (1972) links play to Goffman's frame analysis (1974): "play occurs within a delimited psychological frame, a spatial and temporal bounding of a set of interactive messages." Goffman himself aims at a certain granularity of experience by using the term "strip" by which he means "any arbitrary slice or cut from the stream of ongoing activity, including here sequences of happenings, real or fictive, as seen from the perspective of those subjectively involved in sustaining an interest in them (Goffman 1974)." In a similar fashion Zerubavel (1991) speaks of "mental fences," which "delimit geographical areas, historical events, people, ideas, and so on that appear to be contiguous, similar, functionally related, or otherwise associated." Zerubavel, (1991) reminds us that boundaries allow us to "visually as well as mentally to grasp any entity at all."

Salen and Zimmerman (2003) link Huizinga's (1955) notion of the 'magic circle' to Bateson's analysis of play as a frame that "delimits the peculiar space of play." When someone engages in play, he/she crosses a boundary (into the magic circle) that separates the artificial world of the game from "real life." The magic circle is a frame that sets a thick boundary between real life and the make believe of game play. This cognitive frame establishes the "reality" of the game. Anthropologist Tom Boellstroff (2008) suggests that the "magic circle" – may constitute a virtual world meaningful in its own right. Bateson points out that this is a paradoxical state of mind (Bateson 1972, p. 84). For the player the game is simultaneously real and not real. This boundary is likewise thin – the player can easily stop and step instantly back into "real life."

Work-family-life border/boundaries theories (Ashforth 2000; Clark 2000) likewise make use of the concepts of boundaries and borders to understand how daily life is "sliced" into discrete domains. These theories study the conflicts and interactions that arise between the domains of work, family life and what is termed third places defined as social activities outside the home or work place. This partitioning makes it possible for "one to concentrate more on whatever domain is currently salient and less on other domains."

These borders can be both flexible and permeable. Behavior can spill over from one domain into another when flexible boundaries allow a role to “be enacted in various settings as various times (Ashforth et al. 2000).” Flexible borders or boundaries can be characterized by the “degree to which the spatial and temporal boundaries are pliable.” A role having flexible boundaries “can be enacted in various settings and at various times”. Permeability can be measured as “the degree to which a role allows one to be physically located in the role’s domain but psychologically and/or behaviorally involved in another role (Ashforth et al. 2000).”

The framework of border/boundary theory does not take into account domains beyond so-called third places. I have argued elsewhere (Garvey 2010) that the virtual should be considered as a fourth place. The analytical tool set of work-family-life border/boundary theories does not capture the full dynamic of the phenomena of immersion in the domains of virtual worlds and video games. These theories as currently formulated have little to say about how gamers are “quite facile at juggling roles” and how gamers can easily and quickly navigate back and forth between the domains of play (the virtual) and real life.

4. Toward a new survey

The foregoing discussion suggests that a number a new survey instruments could be devised that would examine the notion of the magic circle, paradoxical states of mind as manifested in game play, role-playing and boundaries. Goffman’s notion of frames has enormous intuitive appeal but suffers from an awkwardness of how to design experimental questions that get at this idea, that are testable and indeed quantifiable. Boundaries and borders have likewise a certain conceptual appeal. But as discussed above the border/boundary framework suffers from certain limitations when we try to apply this framework beyond the work/family balance framework.

The Boundary Questionnaire (Hartmann, 1991; Hartmann, Harrison and Zborowski 2001) offers another approach to using the notion of boundaries as an investigative tool. The BQ is a 138-item instrument that covers 12 categories of boundaries. Hartmann et al. point out that there is a long tradition in the field of psychology of investigating “perceptual boundaries, boundaries related to thoughts and feelings, boundaries between states of awareness or consciousness, sleep-dream-wake boundaries, boundaries related to memory, body boundaries, interpersonal boundaries, boundaries related to sexual identity and other forms of identity, group boundaries, and boundaries in opinions and judgments.” Hartmann et al. (1991; 2001), distinguish thick (solid) boundaries from thin or permeable boundaries. They have also developed a theory of dreams based on a “wake-dreaming continuum (Hartman 1989; Hartmann & Kunzendorf 2007).” This continuum begins on one end with “focused waking thought” having thick boundaries characterized by “solid, divisions, categorizations.” On the other end of the continuum is “Dreaming” having “thin boundaries” characterized as “merging, condensation, loosening of categories.” Hartmann et al. (2001) introduces the following table compiling types of boundaries:

Perceptual boundaries
Between sensory inputs
Sensory focus or “bandwidth”
Around perceptual entities
Boundaries related to thoughts and feelings
Between two thoughts or two feelings
Between thought and feeling
Around thoughts and feelings (free association)
Boundaries between states of awareness or states of consciousness
Sleep-dream-wake boundaries
Between sleep and waking
Between dreaming and waking
In and around the dream
Daydreaming
Boundaries related to play
Boundaries related to memory
Early memories
Recent memories and memory organization
Personal past
Future plans
Boundaries around oneself (body boundaries)
Barriers against stimuli
The skin as a boundary
Posture and musculature as boundaries
Personal space
Interpersonal boundaries
Boundaries between conscious and unconscious and between id, ego, and superego
Defense mechanisms as boundaries
Boundaries related to identity
Sexual identity
Age identity: Between adult and child
Constancy of identity
Group boundaries
Boundaries in organizing one’s life
Boundaries in environmental preferences
Boundaries in opinion and judgments
Boundaries in decision making and action

Table 1. Types of Boundaries (Hartmann et al. 2001)

The Boundary Questionnaire (BQ) organizes those various kinds of boundaries into twelve categories (Hartmann et al. 2001):

Category 1: Sleep/Dream/Waking
Category 2: Unusual Experiences
Category 3: Thoughts/Feelings/Moods
Category 4: Childhood/Adolescence/Adult
Category 5: Interpersonal
Category 6: Sensitivity
Category 7: Neat/Exact/Precise
Category 8: Edges/Lines/Clothing
Category 9: Opinions re Children, etc.
Category 10: Organizations
Category 11: Peoples/Nations/Groups
Category 12: Beauty/Truth

Table 2. Categories of Boundaries (Hartmann et al. 2001)

Hartmann et al. (2001) argue that “thick vs. thin boundaries appears to be a robust personality measure, which can be considered an important dimension of personality.” Boundaries related to “sexual identity” and “constancy of identity” are of direct relevance in a discussion of the use of avatars in virtual worlds and games. Thus the BQ might serve as a model for a new survey. In order to make such an instrument relevant to the target population the questions in the BQ could be slightly revised in a similar fashion to the approach described above with the SCI-DER.

The following table (Hartmann et al. 2001) lists the each of the twelve categories of boundary types. Under each category are two sample items from original the BQ followed by revisions of each items modified in such a way that it applies to the experience of using the virtual world *Second Life*. Subjects are given instructions to rate each of the statements on a scale from 0 to 4, where “0” indicates either the subject thinks the statement does not apply to him/her (not at all or not at all true of me). A “4” indicates that the subject thinks the statement definitely applies (true of me).

Category 1: Sleep/Dream/Waking

1. When I awake in the morning, I am not sure whether I am really awake for a few minutes.

37. I spend a lot of time daydreaming, fantasizing, or in reverie.

Agreement with these questions are indicative of thin boundaries. Question 1 and 37 could be modified as follows:

1. When I awake in the morning, I am not sure for a few minutes whether I am logged into Second Life or really awake.

37. I spend a lot of time daydreaming, fantasizing, or in reverie about Second Life.

Category 2: Unusual Experiences

61. At times I have felt as if I were coming apart.

100. I have had déjà vu experiences.

The modified questions are:

61. At times while using Second Life I have felt as if I were coming apart.

100. In Second Life I have had déjà vu experiences.

Category 3: Thoughts/Feelings/Moods

15. Sometimes I don't know whether I am thinking or feeling.

74. I can easily imagine myself to be an animal or what it might be like to be an animal.

In Second Life users can change the appearance of their avatar. A large group of users choose to be furies – avatars that have animal heads, tails and paws. The modified questions are:

15. Sometimes while using Second Life I don't know whether I am thinking or feeling.

74. In Second Life I can easily imagine myself to be a furry or what it might be like to be a furry.

Category 4: Childhood/Adolescence/Adult

4. I am very close to my childhood feelings.

*40. I have definite plans for my future. I can lay out pretty well what I expect
year by year for the next few years.*

The modified questions are:

4. I am very close to my childhood feelings when using Second Life.

*40. I have definite plans for my future logins in Second Life. I can lay out pretty well what I expect year by year for the
next few years.*

Category 5: Interpersonal

53. When I get involved with someone, we sometimes get too close.

103. I am a very open person.

The modified questions are:

53. When I get involved with someone in Second Life, we sometimes get too close.

103. In Second Life I am a very open person.

Category 6: Sensitivity

-
6. *I am very sensitive to other people’s feelings.*
-
42. *I am unusually sensitive to loud noises and bright lights.*
-

The modified questions are:

-
6. *While in Second Life I am very sensitive to other avatar’s feelings.*
-
42. *While in Second Life I am unusually sensitive to loud noises and bright lights.*
-

Category 7: Neat/Exact/Precise

-
19. *I keep my desk and work table neat and well organized.*
-
43. *I am good at keeping accounts and keeping track of my money.*
-

In *Second Life* each user account has an inventory where the user can store various items such as clothing or objects. The currency of *Second Life* is called Lindens and can be purchased using real money. Questions 19 and 43 can be modified as:

-
19. *With my Second Life account I keep my inventory and folders neat and well organized.*
-
43. *I am good at keeping accounts and keeping track of my Lindens in Second Life.*
-

Category 8: Edges/Lines/Clothing

-
32. *I like heavy, solid clothing.*
-
44. *I like stories that have a definite beginning, middle, and end.*
-

The modified questions are:

-
32. *When in Second Life I like clothing to have a heavy, solid look.*
-
44. *I like stories that have a definite beginning, middle, and end.*
-

Category 9: Opinions re Children, etc.

-
33. *Children and adults have a lot in common. They should give themselves a chance to be together without any strict roles.*
-
56. *I think a good teacher must remain in part a child.*
-

Table 3. Sample Items by Category

The following modification is problematic as Linden Labs (makers of *Second Life*) found it necessary to age segregate users by creating a separate but equal version of *Second Life* for teens. In fact underage role-playing is prohibited in *Second Life* for adults. The modified questions are:

33. *Children and adults have a lot in common. In Second Life they should give themselves a chance to be together without any strict roles.*
56. *I think a good mentor must remain in part a child.*

Category 10: Organizations

10. *In an organization, everyone should have a definite place and a specific role.*
58. *A good relationship is one in which everything is clearly defined and spelled out.*

The modified questions are:

10. *In Second Life, everyone should have a definite place and a specific role.*

58. *In Second Life, a good relationship is one in which everything is clearly defined and spelled out.*

Category 11: Peoples/Nations/Groups

11. *People of different nations are basically very much alike.*

105. *There are no sharp dividing lines between normal people, people with problems, and people who are considered psychotic or crazy.*

The modified questions are:

11. *In Second Life people from different sims, groups and regions are basically very much alike.*

105. *In Second Life there are no sharp dividing lines between normal people, people with problems, and people who are considered psychotic or crazy.*

Category 12: Beauty/Truth

36. *Either you are telling the truth or you are lying; that's all there is to it.*

76. *When I am in a new situation, I try to find out precisely what is going on and what the rules are as soon as possible.*

The modified questions are:

36. *Either you are telling the truth or you are lying; that's all there is to it.*

76. *When I am in a new sim in Second Life, I try to find out precisely what is going on and what the rules are as soon as possible.*

A subject's score is obtained by adding up all the scores (0-4) for all items. Some items are scored backwards i.e. an answer of "0" is scored as 4, "1" is scored as 3, "2" is scored as 2, "3" is scored as 1, and "4" is scored as 0. A reverse logic is built in to the questionnaire design so respondents need to think about each response instead of answering mechanically. A subject with a low score is interpreted as having "Thick boundaries" and those with higher scores are determined to have "Thin boundaries."

The prediction would be that subjects with thick boundaries would keep the domains of the real and the virtual clearly separate. It would also be expected that subjects whose scores are low would be able to quickly navigate back and forth and still maintain the boundaries. Subjects with thin boundaries would possibly experience spill over effects from one domain to another. Subjects with thick boundaries will be on the "focused waking thought" end of the "wake-dreaming continuum" which is characterized by "solid, divisions, categorizations." Those subjects with thin boundaries are on the "Dreaming" end of the continuum characterized as "merging, condensation, loosening of categories." Hartmann et al. (2001) notes: "... people with thick boundaries spend more time and find themselves more comfortable at the left-hand end of our continuum involved in focused waking. They can be considered, "thought people," whereas the peo-

ple with thinner boundaries are more comfortable at the other end of the continuum and can be thought of as “dream people,” although these terms are obviously an over-simplification.” The authors acknowledge at one time or another individuals can exhibit both thin and thick boundaries. Most individuals experience the different aspects of the “wake-dreaming continuum” during the course of entire day.

Subjects with thin boundaries might be predicted to experience spill over effects such as daydreaming about the virtual world or perhaps confusing dreams about the virtual world with actual experiences as a user of that virtual world. However the BQ is not able to determine exactly what those spill over effects might be, rather it predicts the tendency for a subject to behave in a manner consistent with thin or thick boundaries. In fact it really is a measure of self-assessment of attitudes in regard to each of the identified categories. To determine how a subject actually behaves, what they perceive, whether or not there are spill over effects with daydreams or dream recall between the domains of the real and virtual likely requires another research methodology. In related dream research Hartmann employs a qualitative approach where subjects provide written descriptions of dreams. Such methodologies may get at other details that quantitative measures miss.

As part of a theory of dreams Hartmann introduces the concept of a Central Image (Hartmann & Kunzendorf 2006-7) or Contextualizing Image (Hartmann et al. 2001) that dominates in “big” and generally memorable dreams. The CI is often the feature that is readily remembered about a dream. Individual with “thin boundaries” tend to remember their dreams while individuals with “thick boundaries” tend to not remember their dreams. Do users of virtual worlds with thin boundaries have dreams where there is a high intensity Central Image based on their experiences in Second Life?

5. Conclusion

To make real progress in understanding the complex nature of the borders and boundaries that separate the real from the virtual necessitates a multifaceted approach. A new “boundary questionnaire” is one step toward further study. There remains a broader question. In an age where new technologies such as augmented reality blur the boundaries of the real and virtual how do we achieve a consensus about norms of mental health against which we make judgments about what is to be considered deviations from that norm? Since the period of the enlightenment science has been the answer. But today we live in era of climate change denial, political campaigns that ignore “fact checkers”, the rise of religious extremism where competing versions of reality clash. If we add on to this the overlay of virtual worlds and augmented realities, along the real possibility of malware and cyber attacks that might distort what is heard and seen, where does it leave the rational understanding of the “real?” How do we determine if “reality testing is intact?” And whose reality is it?

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