

**Digital Images as Meaning Bridges: Case study of assimilation using avatar software in counselling with a 14 year old boy**

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### **Abstract**

**Objectives.** According to the assimilation model, psychotherapeutic progress involves building semiotic meaning bridges between disconnected parts of the person. Previous research has focused on verbal meaning bridges; this case study investigated whether and how digital imagery might serve as well.

**Design.** This was a qualitative theory-building case study.

**Method.** The client was a 14 year-old boy with autism spectrum disorder seen in school counselling for 60 sessions. Assimilation analysis was applied to screen recordings and accompanying voice recording nine sessions, drawn from an early part of his treatment, during which he participated in an evaluation of video game-like software designed for therapy and coaching.

**Results.** The client created avatars representing aspects of himself and significant others and scenes representing his problems and coping. The imagery and meanings evolved across this segment of treatment, providing a channel of interpersonal and intra-personal communication.

**Conclusions.** Observations showed how digital imagery can serve as meaning bridges between client and counsellor and between internal parts of the client.

**Key words: technology in psychotherapy, qualitative methods, assimilation theory, Autistic Spectrum Disorder, adolescent psychotherapy**

## **Digital Images as Meaning Bridges: Case study of assimilation using avatar software in counselling with a 14 year old boy**

### **Introduction**

The assimilation model suggests that psychotherapeutic progress involves building semiotic meaning bridges between previously disconnected parts of the person (Stiles, 2011). A meaning bridge is a sign (e.g., a word, a gesture) or a system of signs (e.g., a story, an interpretation) that has similar meaning to both author and addressee, allowing them to share each other's experience to some degree. This case study investigated whether and how computer-generated digital images might serve as therapeutic meaning bridges, supplementing verbal meaning bridges in psychotherapy. The study focused on a 14 year-old boy who participated in a trial of video game-like *avatar software* in school counselling. This was a qualitative theory-building case study (William B. Stiles, 2007, 2009). We sought theory-relevant observations on the client's use of the imagery, which might support or contradict the theory or suggest elaborations.

### **The Assimilation Model**

According to the assimilation model, a person's experiences leave traces, which may later be reactivated. Reactivated traces may act and speak, and are described, metaphorically, as voices. Normally, traces of people's experiences become interlinked into constellations of related experiences, forming, metaphorically, a community of voices, which comprise the person's usual self (Honos-Webb & Stiles, 1998; William B. Stiles, 2011). Such assimilated voices are smoothly accessible and available to the person as resources.

Some experiences, however, remain unassimilated because they are incompatible with the usual self or are threatening, frightening, or painful. In successful psychotherapy clients build meaning bridges to such problematic experiences, first with the therapist and then with

his or her own community of voices, reducing distress and allowing smooth access. A series of theory-building case studies has suggested that assimilation follows a developmental course summarized in the Assimilation of Problematic Experiences Sequence (APES; Basto, Stiles, Rijo, & Salgado, 2018; (Brinegar, Salvi, Stiles, & Greenberg, 2006; William B. Stiles, 2011; W.B. Stiles & Glick, 2002), described later.

Meaning bridges may be simple words or phrases or they may be self-narratives or interpretations (Brinegar et al., 2006; Stiles, 2011). Whereas previous assimilation research has focused on verbal meaning bridges, this case study explored whether and how visual imagery might also be used to share and link experiences.

### **Counselling for Autistic Spectrum Disorder (ASD)**

ASD is classified by the DSM-5 (APA, 2013) amongst the group of Neurodevelopmental Disorders, which have an early developmental onset and result in impairments in social and personal functioning. ASD leads to a range of symptoms resulting in difficulties in social interactions and functioning, and repetitive patterns of behaviour, interests and activities (APA, 2013). These symptoms have impact on developing and maintaining reciprocal social relationships. ASD can range in the levels of severity and the requirements for support in everyday functioning. However, by the time children reach secondary school, they perform less well than their peers in nearly all areas of school adjustment and are rated as more anxious and withdrawn, as well as more oppositional and aggressive (Ashburner, Ziviani, & Rodger, 2008). Research by Samson, Huber & Ruch (Samson, Huber, & Ruch, 2011) found that 45% of adults diagnosed with Asperger's syndrome (AS) experienced fear of being laughed at, compared to only 6% of adults without the diagnosis. Although aggression has been identified as an issue for adolescents with ASD, there is also evidence that they are perceived as different and become a target for bullying. This is particularly the case for those with high functioning ASD, who attend mainstream schools (Auger, 2013). In addition to

this, social isolation exacerbates the effects of bullying (Humphrey & Symes, 2010)).

In the UK, school counselling is one of the prime settings to deliver mental health interventions for young people, with a potential to reduce its associated stigma (Kavanagh (Kavanagh et al., 2009). Humanistic school based counselling is the most common type of counselling for young people in the UK (M. Cooper, 2013) and focuses on empowering clients to make changes in their life by exploring their inner world and expressing emotions with an empathic and attuned adult.

### **Avatar Software as a Therapeutic Tool**

To investigate the use of images in therapy, we drew one case from an evaluation study (M. Cooper, Chryssafidou, & van Rijn, 2016; Biljana van Rijn, Cooper, & Chryssafidou) of a proprietary video game-like tool developed for therapy and coaching, which we call avatar software. The software allows clients to create digital visual representations of their inner worlds, and life situations, including avatars (virtual people) representing themselves and others. A more detailed description of this avatar software is presented later. Results of the evaluation study showed that taking part in the intervention, which involved access to the software for approximately 10 counseling sessions, was associated with small-to-medium reductions in personal distress and an increase in self-compassion for male clients and for those starting a new episode of therapy. The intervention was experienced as more satisfying and helpful by male clients than by female clients and by those who reported they had been diagnosed with learning difficulties, including ASD (M. Cooper et al., 2016; Biljana van Rijn et al.). We speculate that the attractiveness to learning disabled and ASD-spectrum clients might meet the predominantly visual thinking style of this group (Anderson and Morris, 2006; Donoghue, Stallard and Kucia, 2011; Paxton and Estay, 2007).

This avatar software was of the sort described as the 'client as avatar' model (Rehm et al. 2013), in which the client is represented as an avatar, along with other representations of the client's external reality or internal self. The therapist's role is to help the client to navigate through and reflect on the scenes. The therapist is not necessarily represented in the virtual world. In a study of using this avatar software as an adjunct to face-to-face group therapy in a prison setting, qualitative analysis of interviews suggested that the intervention was acceptable to both the prisoners and the counselor and that it facilitated the development of reflection, insight and empathy (B. van Rijn, Cooper, Jackson, & Wild, 2015) . The same software was used in a case study of two adolescent boys, showing that it could be integrated into clinical practice and that it enhanced communication with young people who found communication difficult. (Falconer, Davies, Grist, & Stallard, 2019)

The use of digital avatars is an emerging adjunct to psychological therapy (Espie et al., 2016). Avatar-based approaches, usually in the form of a virtual world populated with avatars on a computer screen and manipulated using a keyboard and mouse, have been used to investigate positive inter- and intra-personal relating (Hoch et al., 2012; Yuen et al., 2013). For example, (Craig et al., 2015; Leff, Williams, Huckvale, Arbuthnot, & Leff, 2013) instructed clients to customize avatars to represent their auditory hallucinations. A role play where the therapist spoke the words of the avatar offered an opportunity to interact with their auditory hallucinations in a constructive way. The proposed psychological benefits of digital approaches to therapy, of which avatar-based approaches are a subset, include greater self-disclosure due to the disinhibition through psychological distance, access to alternative channels of communication and expression, an arena to explore identity, and capitalizing on some clients' familiarity with digital media (see Gorini, Gaggioli, Vigna, & Riva, 2008; Rehm et al., 2016).

## **Research Aims**

We investigated the use of digital imagery in school counseling by Richard (a pseudonym), a 14-year old boy previously diagnosed with ASD. Our aim was to investigate how the digital imagery was used in counselling. We used assimilation analysis (W. B. Stiles & Angus, 2001) to examine a series of sessions drawn from a longer course of counselling. We were particularly interested in how the digital images might be used as meaning bridges, that is, for communication between Richard and his counsellor and for Richard's understanding of himself. Showing how visual imagery can serve as meaning bridges would be a significant elaboration of the assimilation model.

We did not attempt to evaluate the efficacy of the avatar software for use in counselling. Indeed, the material we studied did not afford such an evaluation. To engage at depth with how the software was used during therapy, we used a methodology that would help us to explore the process of change in avatar assisted therapy. Theory building case study (Schielke, Fishman, Osatuke, & Stiles, 2009; William B. Stiles, 2007) and assimilation analysis (Stiles & Angus, 2001) provided an appropriate approach. Theory-building case study research seeks to evaluate and strengthen a theory by examining many aspects of the theory in particular cases rather than testing one aspect across many cases, as in statistical hypothesis testing. Generality is specified by the theory (in our case, by the assimilation model), not extrapolated from the (single) case (W. B. Stiles, 2009; W.B. Stiles, 2017) (William B. Stiles & Horvath, 2017). We sought observations relevant to many aspects of the assimilation model, mindful that the observations could support or contradict the theory or suggest possible elaborations.

## **Method**

### **Client**

Richard was a 14 year-old White British boy, who received counseling at his school.

He had previously been diagnosed with ASD, and this was listed as the reason for his referral. We estimated that his cognitive abilities were in the average range; he presented with fluent language skill, and he was succeeding academically in a regular school environment, though feeling odd and unaccepted among his peers at school. Problems and concerns identified in his initial assessment included longstanding anxiety, self-esteem and identity issues, anger, and behavior problems. He had interest and extensive experience in video games, which was relevant to his comfort with the avatar software and to the content of his counselling.

### **Counselor and Treatment**

The counsellor had an Advanced accredited Diploma in Humanistic Counselling and a Certificate in Psychodynamic counselling, with over six years of post-qualification experience. This approach focuses on building the therapeutic relationship, empathic enquiry and accepting clients and their experience. The counsellor appeared to use this approach; however, there was no formal adherence check. Sessions took place in a quiet room, the usual setting for counselling in Richard's school.

### **Investigators**

The four investigators included a female psychotherapist and a counselling psychologist in her 50s, a female researcher in her 40s who had a background in education background, a female researcher in her 30s who had a background in cognitive psychology and virtual reality research, and a male clinical psychologist in his 70s. All four were authors of this report.

### **Avatar Software**

The avatar software was designed by ProReal, Ltd. (<http://www.proreal.co.uk/>), a British company, as a therapeutic tool for counselling and coaching. The action is set in a rural, somewhat medieval landscape containing hills, fields, a forest, a river, and a castle. Androgynous avatars can be created to represent self or others; these can be assigned names,

emotions, postures (movements miming attitudes, e.g., 'stressing/regretting/OMG' ), colours, sizes, and inner voices or thoughts. A variety of props, including bridges, walls, milestones, gravestones roadblocks, treasure chests, platforms, shields, bombs, mirrors, elephants, and more can be added and labelled. The interactive landscape can be viewed from any avatar's perspective or from a "roaming" perspective in or above the landscape.

In preparation for the evaluation study from which Richard's case was drawn, counsellors were given guidelines, detailed in a ProReal User Manual (ProReal Ltd, 2015), and they were trained in using the software by the members of the ProReal Ltd team. During sessions, when the software was in use, the client and counsellor sat facing a single computer screen, side-by-side, but at an angle so that they could see each other as well as the screen. At the beginning of each session, the counsellor would normally invite the client to represent his or her world within the landscape. However, clients were not required to use the software, and clients varied in how much they used it.

### **Ethical Procedures**

We sought consent in stages. Participants, parents, and counsellors gave initial informed consent for the software evaluation study (Cooper et al., 2016). Following the evaluation study, we asked all the participants for consent to contact them again for potential inclusion in the case study research. Having chosen Richard, we asked him, his parents, and his counsellor for consent to use the recorded material in the case study. We removed the personal details, used a pseudonym, and kept the school details confidential. In the post-analysis interview, we shared our analysis with Richard and the counsellor, gave them a final opportunity to add or remove any data, and requested and received their consent to use their materials and report our findings.

### **Case Selection**

We sought a case in which the client used the avatar software for at least six sessions,

to allow us to potentially observe changes in the use of the imagery. Three clients met all the criteria and gave all the permissions, and we chose Richard, mindful that the evaluation study suggested the avatar software might be particularly acceptable for male clients and those with learning difficulties.

Prior to beginning the software evaluation study, Richard had had ten sessions with his counselor. During the study, Richard had 11 sessions (one beyond the study's intended maximum), his sessions 11-21, and he used the avatar software during all or part of nine of them. He chose not to use the software in his sessions 16 and 19. After the end of the study, Richard continued in counselling for approximately another 40 sessions.

On the standard measures used in the software evaluation study, Richard showed little change across the 11-week period we studied. However, as noted earlier, Richard was still in the first third of his 60-session course of counselling.

### **Case Materials**

We used video recordings of the onscreen images and accompanying audio recording of the dialogue in the portions of the nine counselling sessions during which Richard used the software, and we made verbatim transcripts of the audio recordings. In sessions 11-15, Richard used the software for all or most of his 50 min. However, in session 11, there was no audio recording due to a technical failure. Richard did not use the software at all in sessions 16 and 19, and in sessions 17, 18, 20, and 21, he used it for only 25 min., 16 min., 22 min., and 27 min., respectively. We did not have recordings or transcripts of other portions of these sessions or of any other sessions. We also used transcripts of the semi-structured interviews with Richard and with his counsellor.

### **Assimilation of Problematic Experiences Sequence (APES)**

The APES describes the developing relation of a problematic experience (or voice) to the person's usual self (or community of voices) across successful treatment (Stiles, 2011;

Stiles & Angus, 2001). The current version includes eight stages or levels, numbered 0 to 7:

- (0) Warded off/dissociated,
- (1) Unwanted thoughts/active avoidance,
- (2) Vague awareness/emergence (often with considerable distress),
- (3) Problem statement/clarification (naming the problem, so it can be talked about and worked on),
- (4) Understanding/insight (or, equivalently, mutual understanding between voices),
- (5) Application/working through (adjusting the understanding in daily life),
- (6) Resourcefulness/problem solution (using the formerly problematic experience as a resource), and
- (7) Integration/mastery (the experience/voice is a part of the self).

Clients may enter therapy at any stage, and any movement through the sequence may be regarded as progress. (W.B. Stiles & Glick, 2002; William B. Stiles et al., 1991). The APES is considered a continuum, and intermediate stages are possible (e.g., 2.3, 3.6).

Brinegar et al. (2006) distinguished a series of sub-stages between stages 3 and 4 that proved useful in this study:

- (3.2) rapid cross-fire, as the problematic and dominant community voices express their contrasting views,
- (3.4) entitlement, as the problematic voice asserts its position more forcefully,
- (3.6) respect and attention, as the voices listen to each other, and
- (3.8) joint search for a mutually acceptable formulation.

The APES has sometimes been used as a formal rating scale. However, we did not do formal ratings but instead used it only to specify our own interpretations.

### **Assimilation Analysis**

The four investigators applied assimilation analysis (Stiles & Angus, 2001) to the

recordings of the onscreen imagery with background audio and transcripts. This procedure can be described in four steps. These steps were conducted by each investigator independently, with periodic video conferences to discuss impressions and progress (Schielke et al., 2009).

*Familiarization.* The investigators intensively studied the recordings and read the transcripts, making notes and/or using qualitative analysis software.

*Theme identification.* Based on the acquired familiarity and notes, the investigators identified salient and therapeutically important themes and worked toward a consensus formulation of a focal theme.

*Extraction of theme-related material.* Session material, including screenshots and dialogue relevant to the focal theme were excerpted and examined in sequence to highlight Richard's work.

*Interpretation and writing.* The observations were described and interpreted in theoretical terms. APES stages were used to specify estimates of the problem's degree of assimilation. Initially, the investigators maintained separate versions of the descriptions and interpretations of session events and drafts of the report. Periodically, investigators posted their current versions on a shared server. In this way, ideas and text were shared freely while being independently retained as long as each investigator felt it represented the best interpretation (Schielke et al., 2009). Later these separate accounts were integrated.

The interpretations drew on familiarity with all sessions. Meanings that might not have been apparent in an isolated moment or image could be understood in the context of material that occurred earlier or later.

The process of interpretation was not quick, simple, straightforward, or linear. Each investigator alternated between the material and interpretations, drawing on each other's

growing understanding. In the end, Richard's work seemed understandable, even systematic, and we have tried to represent this understanding in reporting the results.

*Post Analysis Interviews.* One of the investigators presented a synopsis of the interpretations, illustrated with screenshots and interviewed Richard and the counsellor separately for about 40 minutes each. The interview was semi-structured and consisted of open questions, probes for agreements or disagreements, and invitations to rephrase the interpretations. Both were again asked for (and gave) their consent to publish the analysis. Their comments were integrated into this report.

## **Results**

### **Focal theme: Being different**

We focused our analysis on Richard's problematic experience of being different, which was salient in all of the sessions we studied. This theme encompassed his longing to be "normal" and experiences of not belonging and not fitting in. Richard attributed his difference mainly to his ASD diagnosis. He reported that his peers at school sometimes "mocked" him, treated him as different or odd, and laughed at him for reasons he did not understand, at least initially. On the other hand, among his video gaming peers (e.g., in an after-school games workshop he frequented and in online groups), he was accepted and even admired in some respects. In the post-analysis interviews, both Richard and his counsellor agreed that being different was the central problem addressed in the whole treatment, not only in the segment we studied. In terms of assimilation theory, Richard's distressing experiences of being different were at odds with his dominant self (community of voices), challenging his sense of self-identity and self-worth.

### **Richard's use of the Avatar Software**

Richard took quickly to the avatar software, requiring little orientation, perhaps partly because he had extensive online gaming experience. He used avatars to represent aspects of

himself and others, and he used props as metaphors for his problems and ways of coping. In contrast, Richard's verbal responses were usually brief, agreeing or occasionally disagreeing with the counsellor's verbal reflections and summaries or giving short responses to questions and comments by the counsellor.

Richard constructed 13 main scenes, which are listed in Table 1, numbered in the order they were constructed. These are illustrated with screenshots in an online appendix (we recommend viewing these along with the text of the results). The first five scenes, which seemed to articulate Richard's focal problematic experience of being different, were constructed in his session 11, the first session where he used the software. He returned to these five scenes and modified them in subsequent sessions to reflect changes in his circumstances and feelings. To respect space limitations, we present only scenes 1, 4, and 5 which show developments in his focal problematic experience, and scenes 6, 9, 12 and 13, which show key aspects of his dominant community of voices and the process of change. We have briefly described scenes 2, 3, 7, 8, 10, and 11 in Table 1 and in the discussion.

Table 1 Overview of principal scenes with relation to focal theme and APES stage

<b>Overview of Scenes:</b>	<b>Online appendix:</b>	<b>Focal theme:</b>	<b>APES stage:</b>
Scene 1. Inside the secure castle walls	Scene 1a. Inside the secure castle walls Scene 1b. Spectator avatar above the castle walls	Representation of feeling safe.	2.8 Formulating the problem.
Scene 2. Roadblocks to cope with anxiety	Scene 2. Roadblocks to cope with anxiety	Avoiding anxiety and self-criticism.	2.8 Formulating the problem.
Scene 3. Riverbank. Dealing with distractibility	Scene 3. Riverbank (dealing with distractibility).	Difficulties with attention and concentration.	2.8 Formulating the problem.
Scene 4. The treasure of normality	Scene 4a. The treasure of normality. Scene 4b. More treasure chests.	Inability to reach "being normal".	3.0. Problem statement and clarification.
Scene 5. Minefield of memories	Scene 5. Minefield of memories.	Difficult memories of being laughed at.	3.0. Problem statement and clarification.
Scene 6. Elephant as games server	Scene 6. Elephant as games server (gaming community).	Acceptance within the gaming community.	3.0. Problem statement and clarification.
Scene 7. Gravestones and Halloween	Scene 7. Gravestones and Halloween.	Experiences of not fitting in.	3.4. A problematic voice is allowed space for reflection.
Scene 8. Games workshop	Scene 8. Games Workshop (enclosed and secure)	An activity centre where Richard feels accepted.	3.0. Problem statement and clarification.
Scene 9. Pacing through the landscape	No individual image	Reflection on how pacing onscreen enabled Richard to stay still in the session.	3.2. Rapid crossfire between problematic and dominant voices.
Scene 10. Bridge with beacons	Scene 10. Bridge with beacons.	Feeling connected.	3.6 Accepting the problematic experience of being different.
Scene 11. Angry troll in the tunnel	Scene 11a. The tunnel Scene 11b Angry troll in the tunnel.	Expressed but unacknowledged anger	No APES rating.
Scene 12. Dancing around the fire	Scene 12. Dancing around the fire (friends as health boosts).	Positive experiences of gaming.	3.6. Continued work on problem statement and clarification.
Scene 13. Monument and a mirror	Scene 13a. Monument and mirror. Scene 13b Everything is peaceful.	Beginnings of self-acceptance.	3.8. Joint working between dominant and problematic voices.

### Scene 1. Inside the secure castle walls

Richard first created a scene within the walls of the castle, later described as a "secure

base", in which he placed a black avatar representing himself. He added avatars that he named Objective 1, Objective 2, and so forth, later identified as peers with whom he wanted more positive social contacts. He also added three milestone props labelled with recent accomplishments, including "gained coping strategies," "joined CCF workshop" (a gaming group), and "saw super moon" (witnessed a rare astronomical event). A campfire prop in the middle, labelled "happiness," seemed to confirm that this first scene referred to contents of his usual self, inside the walls where he felt safe. A screenshot appears as Scene 1a in the online appendix.

In retrospect, the juxtaposition of his achievements (milestones) with his objectives (making positive contact with peers) seemed a meaningful step. This was not yet a clear statement of the central problem, but it noted some important elements (APES 2.8).

In session 13, he piled a large number of platform props on top of each other to build a stairway to the top of the castle wall, giving him a view of the world outside the castle. He added a further black avatar, which he named Spectator, at the top, initially with a neutral emoticon, later changed to happy, and a speech/thought, "everything is peaceful" (Scene 1b in online appendix). In response to the counsellor's questions, Richard characterized the Spectator:

*Richard: It's like how I'd watch everything within like, this, in the same sense that I'm watching it from the outside. So I guess spectator represents myself in reality watching all of this.*

#### **Scene 4. The treasure of normality**

Still in session 11, Richard chose a sunlit forest glade and added a section of wall, which he labelled "cannot get past it", with a treasure chest behind it labelled "normal." (Scene 4a in online appendix). He added a black avatar named Fitting In on the other side of the wall from the chest with a "crying and stressed" emoticon, a posture of

‘stressing/regretting/OMG,’ and an inner voice saying, "I can see it but I cannot achieve it". To us, this was an eloquent and poignant representation of his problematic experience of being different (APES 3.0; problem statement/clarification).

Early in session 13, Richard returned to this scene and increased the number and size of the treasure chests, all labelled 'normal' (Scene 4b in online appendix):

*Counsellor: What does that mean for you today?*

*Richard: Like, because I've been hard to fit in amongst everybody else... Like, because everything that like, happens is like, it always happens like, different for other people other than myself. And then it's like, always seem like other people and then I get treated like really differently.*

*Counsellor: Okay. So what does the normal mean today in that treasure chest? Is that what you would like to be then?*

*Richard: Yes.*

...

*Counsellor: So is that the goal then? Is that the treasure, the feeling like you're fitting in?*

*Richard: Yes.*

Richard seemed to use the images as part of his inner dialogue about the problem.

*Counsellor: So I'm just wondering, is the significance of having more treasure chests, or bigger treasure chests, means that your desire to be normal is bigger, or that you feel more normal?*

*Richard: It's the desire to be normal is bigger.*

*Counsellor: Is that because you feel less like you're fitting in then?*

*Richard: Yes.*

### **Scene 5. Minefield of memories**

Still in session 11, Richard created an avatar named Spectator. In a patch of grass, he placed a sign saying 'memories', two treasure chests labelled as 'good,' and three bombs (round, with lit fuses) labelled as 'bad'. A Spectator avatar looked at the scene, while an inner voice said 'some things are okay and others are not' (Scene 5 in online appendix).

In session 12, he returned to this minefield and deleted two of the bombs. The counsellor commented:

*Counsellor: Okay, so that was different from last week so ... you've got two less of those bombs and you still kept the memories, which is your treasure chest as well. All right. Okay, but there's still a bit of a bomb going on there but not as much.*

*Richard: I had them all here because ... at the moment I keep, like, accidentally doing things that seem to... That other people find funny, like, at my expense.*

*Counsellor: Okay, what, like, in school, do you mean? What, like what, for instance?*

*Richard: I said something, like, I didn't... Nothing rude or anything. I, like, shared my opinion. Then it was, like, a whole bunch of people started laughing at me.*

*Counsellor: Okay, so that's, sort of, representing that fitting in thing, then?*

*Richard: Yes.*

In APES terms, Richard seemed to be trying to make sense of why his peers laughed at him, working on the problem in the range of APES 3.

### **Scene 6. Elephant as games server**

In session 12, Richard introduced his involvement in the gaming subculture. He used an elephant to represent an online games server. He put three avatars on the back of the elephant to represent other gamers and coloured them 'yellow, like warning chevrons' (Scene

6 in online appendix).

*Counsellor: And you said before that it's easier in some ways, talking to people online than in reality?*

*Richard: Yes. See, they don't know who I am so they don't have anything to mock me for before they meet me.*

*Counsellor: Is that the dangerous, hazardous yellow bit then, mocking?*

*Richard: Yes.*

We understood this image as Richard's dominant community conveying a context where he was not different, offering a positive side to the dialogue about his experience of being different.

### **Scene 9. Moving through the landscape**

Throughout his treatment, Richard often moved his perspective rapidly through the virtual landscape (Scene 9 is not in the appendix because it could not be adequately represented in a still screenshot). This was particularly evident when difficult topics emerged.

Richard offered an account in session 14:

*Counsellor: ... but what I've noticed is you've been running around quite a lot, and...*

*Richard: Yes, otherwise I'd end up like goofing around a lot in reality; like I am the bloke pacing around in circles. Like if I wasn't sat down I'd be walking around the table, and I probably would have done it about 200 times by now*

*Counsellor: So that, so the... so you're using the avatar to do the pacing for you?*

*Richard: Yes. I don't need to exercise - the avatar can do that*

In session 15, following his constructing a cosy image representing his games workshop (scene 8), Richard described an online game he called 'Minecraft for autistic people,' where he also felt he fitted in. As he did this, he used an avatar to run and jump through the landscape. The counsellor encouraged Richard to reflect on his ASD diagnosis.

*Counsellor: If you're talking about your difficulty with having that diagnosis, is there any way you can portray that, I suppose, how you feel about it. Is it a difficult thing to...?*

*Richard: (moving to a different scene) Not really. I can jump off here now (referring to the avatar), like, it's huge. Right, that's big.*

The sudden changes of subject might be understood as APES 3.2 (rapid crossfire between voices; Brinegar et al., 2006). The counsellor persisted, and eventually Richard settled into the discussion:

*Counsellor: Okay, what's the worst thing about being autistic for you?*

*Richard: Because it's like I'm not normal and basically, compared to everyone else, I'm mentally defected.*

...

*Counsellor: is it because that's the thing that's difficult for you, sort of, making sense of the rest of the world and other people, because they're different?*

*Richard: Yes.*

*Counsellor: Because in a way, to you, they're the ones that are different, aren't they?*

*Richard: Yes, but I know that I'm actually the one who's different. It feels like they're different but then it's actually me...*

This exploration was the most direct verbal exploration of Richard's focal theme in the material we studied.

### **Scene 12. Dancing around the fire**

In session 18, Richard constructed a still more positive image of his experiences in gaming. He recreated a scene from an online game with friends that depicted their avatars dancing around a fire (Scene 12 in online appendix). He explained that the act of coming together provided a 'health boost' to the virtual characters. Richard gave his avatar the

posture of 'celebrating/cheering', while the two friends were given the postures 'showing direction/leading' and 'open/being up for it'.

*Counsellor: What do you mean health boosts?*

*Richard: Like in the game it like heals you, your character, but then it also looks funny because your characters actually do dance...*

...

*Richard: [This feels good because] it's a lot more social than things in real life tend to be, I guess. ....*

*Counsellor: Well I guess the point is that it makes you feel like you're interacting and having fun with other people, which I guess is, creates a feeling of what, wellbeing or happiness with you.*

*Richard: Yes.*

To us, "health boosts" seemed an apt metaphor for the social acceptance Richard gained from his participation in gaming, a positive contribution by his dominant community of voices to the dialogue with his problem (perhaps APES 3.6).

### **Scene 13. Monument and mirror**

In Session 21, to be sure he had used all of the available props, Richard built a complex, pyramid of them, which he called a "monument," and he put an avatar representing himself at the top (Scene 13a in online appendix). During this process, he discovered a mirror prop, and this led to an exchange concerning how he felt about himself:

*Counsellor: Is there anything you like when you look in the mirror?*

*Richard: Yes.*

*Counsellor: What do you like?*

*Richard: Myself, but not for appearances.*

*Counsellor: You like your internal self?*

*Richard: Yes.*

*Counsellor: That's a really good thing, isn't it?*

*Richard: Yes.*

To us, this explicit self-acceptance, suggested coming to terms with his experience of being different, the sort of mutually acceptable formulation by problematic and dominant voices characteristic of APES 3.8. Towards the end of the session, he used the "everything is peaceful" Spectator avatar to climb his platform stairs to the top of the castle wall and survey the scenes he had built (Scene 13b in online appendix).

### **Post Analysis Interviews**

In the post-analysis interview, Richard examined the screenshots, read parts of the synopsis, and responded to questions. He clearly remembered his use of the software and the specifics of the scenes. He confirmed that the theme of being different was central in his counseling and generally agreed with most interpretations of the scenes, such as the castle being a 'secure base', the game server representing a sense of belonging to the online gaming community, and the scenes with the walls and the bombs referring to his struggles with being different.

The counselor also generally agreed with our interpretations of Richard's imagery as well as with Richard's experience of being different as the central problem addressed in the therapy. She could not recall the scenes and labels as easily as Richard could.

In response to questions about progress over the whole therapy, Richard said he thought not much had changed, whereas the counselor said she saw large improvements in self-confidence and reductions in distress.

### **Discussion**

The digital imagery clearly and sometimes poignantly conveyed Richard's problematic experience of being different. As Richard created his digital world, the counselor

followed, reflected, inquired, and verbalized the experiences to which the images referred. Richard seemed to use the images to conceptualize and work with the focal theme as well as to convey his experiences, suggesting they were meaning bridges intra-personally as well as with the counsellor. The images were also meaning bridges to the investigators, vividly conveying Richard's experience to us and, we hope, to you as readers. This expansion of the concept of meaning bridges is a new addition to the assimilation model (cf. Stiles, 2009, 2011). In effect, the images provided an additional metaphor for the traces of experiences that have previously been described (metaphorically) as voices within the assimilation model.

### **Richard's Path**

According to our interpretation, in the segment of treatment we studied (sessions 11-21 out of about 60), Richard worked first to formulate his problematic experience of being different from his peers and not fitting in and his desire to be normal. He began session 11 by representing his interpersonal objectives as avatars and his recent achievements as milestones in the safe interior of the castle (scene 1). Next, in a more exposed location outside the castle walls (scene 2), he represented protecting himself (an avatar) from anxiety (another avatar) by avoidant coping mechanisms (roadblocks). He represented his unsuccessful efforts at overcoming his attention problems as trying to reach treasure chests (ideas and concepts) on the opposite bank of a river, (scene 3). In scene 4, he represented himself (an avatar) as distraught because he was prevented by his ASD (impassable walls) from being normal (treasure chests). And in scene 5, he represented himself as a spectator surveying a minefield of his own good and bad memories (treasure chests and bombs). In our judgement, during this sequence, Richard's problematic experience of being different moved from partially formulated but still a bit vague (APES 2.8) to being clearly stated using the digital images (APES 3.0).

Richard returned to each of the five initial scenes from time to time, elaborating them

or depicting new developments in his life. And he created new scenes to represent aspects of this work. He examined how he appeared different or odd to other people. For example, gravestone props (scene 7) led to an examination of others' negative reaction to a previous Halloween costume as a cultist. Pacing through the digital landscape (scene 9) expressed his restlessness and led to a discussion of his inability to keep still. Feelings arising from intersession negative experiences were expressed in imagery (e.g., feeling like an angry troll in a dark tunnel in scene 11b).

Other images expressed being accepted in his computer gaming community, which seemed increasingly positive sessions. Scene 6 expressed some ambivalence about gamers with unknown attitudes (an elephant ridden by avatars coloured yellow to signal risk). Scene 8 expressed safety with known gamers (a cosy representation of the games workshop). And scene 12 expressed joy and energy (dancing around a fire).

These visual representations of his problem, his difference, and ways he was normal seemed to be parts of a potential meaning bridge that could encompass both Richard's self-esteem and his experiences of being treated as different. It was not what he wished, but by accepting his symptoms and experiences of being different, he could accept himself more fully, just as María came to assimilate and accept her incurable physical symptom of dizziness in another assimilation study (Gabalda, 2006). A representation of connection in scene 10 (beacons visible across the landscape) following a discussion of his autism seemed to acknowledge a self that included ASD. Likewise, his reaction to the mirror prop (that he liked himself, "but not for appearances"; scene 13) could be a metaphor for coming to terms with his different. We judged his problem had reached about APES stage 3.8 by session 21; his dominant community and problematic voices were working jointly toward an acceptant understanding of being different.

## **Being Different in Adolescence**

The desire to be normal and fit in is typically salient in adolescence (Coie, Terry, Lenox, Lochman, & Hyman, 1995; Somerville, 2013), but Richard's concerns were probably exacerbated by his ASD. Some of the distinctive behaviours he discussed (e.g., constant movement, repetitive behaviours, distractibility) and limited social sensitivity are consistent with an ASD diagnosis (American Psychiatric Association, 2013). Young people diagnosed with ASD are often seen as odd or different and may be socially excluded, misunderstood, bullied, and laughed at (Cousins, 2002; Humphrey & Lewis, 2008; Jackson, 2003; Jones, Zahl, & Huws, 2001; Portway, 2006; Willey, 1999; Wilson, 2017).

## **Using Digital Imagery in Psychotherapeutic Work**

We learned Richard's visual language only slowly, and undoubtedly we and the counsellor missed or misinterpreted some of his meanings. On the other hand, after spending months with Richard's images, we may have understood some meanings that Richard himself didn't fully appreciate.

It seemed to us that Richard used the images to formulate his problem and to work on it. We and the counselor translated the images into words to understand what was going on, but this did not seem essential for Richard. Digital media may be particularly valuable for clients on the autistic spectrum, who may have a predominantly visual thinking style (Anderson & Morris, 2006; Donoghue, Stallard, & Kucia, 2010; Paxton & Estay, 2007). The images clearly and sometimes poignantly conveyed Richard's dilemma, though it took us a while to learn his visual language. Theoretically, as he used the images to share his experience with the counselor, Richard could also see his own productions, making his experience more salient or clearer to his other inner voices, allowing him to reflect on his own psychological changes.

Of course, Richard's counseling involved words as well as images. His verbal responses were usually brief, but he responsively agreed (or occasionally disagreed) with the counselor's more detailed reflections and summaries.

Richard's virtual pacing through the digital landscape increased when he talked about distressing events, but this pacing seemed to help him sit still and stay on topic. Perhaps his repetitive use of platforms in scene 1, and bridges in scenes 11b and 13a was a sign of his ASD. The avatar software also offered handy ways to change the topic when the discussion of a problem exceeded the upper limit of his comfort zone (Leiman & Stiles, 2001; Ribeiro et al., 2014); frequently, he began talking about features of the software when the counsellor asked about potentially distressing material.

Richard's Spectator avatars (in scenes 1, 5, and 13 and elsewhere) were always apart, observing from the top of the castle, from a riverbank, or from behind a wall. These avatars could refer to an experience of separateness and difference. Alternatively, they could refer to what some theorists have called an observer position (see, e.g.,(Leiman, 2004), a manifestation of reflective functioning, mindfulness, or an observing ego, which can be contrasted with an enmeshed, experiencing position. Richard's spectators observed scenes representing his internal world, so in a sense, they represented thinking about his own mental processes, a positive prognostic sign (e.g.,(Wallin, 2007). Theoretically, they may represent the internal voice of the aggregated experience of self-observation built from his experiences in the treatment itself. In his post-analysis interview, Richard disagreed with the interpretation that the spectator avatars were a metaphor for being an outsider. Rather, he described them merely as a way to view things from above--closer to the interpretation that the Spectator represented an observer position.

Our observations did not speak to the effectiveness of the digital imagery in reducing

symptoms, but they did speak to its effectiveness in facilitating communication. Richard was articulate in describing his problems and shifting attitudes using the digital imagery. Sometimes the imagery conveyed his feelings directly (albeit metaphorically); other times it was a springboard for verbal exploration. Richard entered counselling adept at using digital imagery through his gaming experience. Many clients would not be so adept. On the other hand, digital imagery might provide a resource for other clients unaccustomed to communicating psychologically difficult material verbally, such as adolescent boys and those on the autistic spectrum (Anderson & Morris, 2006; Donoghue et al., 2010; Paxton & Estay, 2007).

### **Limitations**

This study was limited by the relatively narrow window of observation --parts of only 9 sessions drawn from a 60-session treatment. We knew little of Richard's personal circumstances or history and had no diagnostic evaluation. Our APES ratings were not independent and should be regarded as specifying rather than supporting our interpretations.

In theory-building research, one does not generalize from observations; the theory specifies its own range of application (Stiles, 2009). Our observations do suggest an elaboration, that assimilation theory could encompass imagery as a supplement to verbal expression for constructing interpersonal and intra-personal meaning bridges. Of course, like all theoretical formulations, this elaboration is tentative and requires support in further research.

## References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders. DSM-5 TM* (Fifth ed.). Washington, DC;London,England: American Psychiatric Publishing.
- Anderson, S., & Morris, J. (2006). Cognitive behaviour therapy for people with asperger syndrome. *Behavioural and cognitive psychotherapy*, 34(3), 293-303.
- Ashburner, J., Ziviani, J., & Rodger, S. (2008). Sensory processing and classroom emotional, behavioral, and educational outcomes in children with autism spectrum disorder. *The American Journal Of Occupational Therapy: Official Publication Of The American Occupational Therapy Association*, 62(5), 564-573.
- Auger, R. (2013). Autism Spectrum Disorders: A Research Review for School Counselors. *Professional School Counseling*, 16(4), 256-268. doi:10.5330/PSC.n.2013-16.256
- Brinegar, M. G., Salvi, L. M., Stiles, W. B., & Greenberg, L. S. (2006). Building a meaning bridge: therapeutic progress from problem formulation to understanding. *Journal of Counselling Psychology*, 53(2), 165-180. doi:10.1037/0022-0167.53.2.165
- Coie, J., Terry, R., Lenox, K., Lochman, J., & Hyman, C. (1995). Childhood peer rejection and aggression as predictors of stable patterns of adolescent disorder. *Development and Psychopathology*, 7(4), 697-713. doi:Doi: 10.1017/s0954579400006799
- Cooper, M. (2013). *School-based counselling in UK secondary schools: A review and critical evaluation*. Retrieved from Lutterworth:
- Cooper, M., Chryssafidou, E., & van Rijn, B. (2016). *ProReal avatar-based counselling with young people. Evaluation report*. Retrieved from
- Cousins, E. (2002). *Exploring the experience of a late diagnosis of asperger syndrome and high-functioning autism: a review of relevant theory, research and methodology*. (unpublished doctoral thesis), University of Exeter, Exeter, UK.
- Craig, T. K. J., Rus-Calafell, M., Ward, T., Fornells-Ambrojo, M., McCrone, P., Emsley, R., & Garety, P. (2015). The effects of an Audio Visual Assisted Therapy Aid for Refractory auditory hallucinations (AVATAR therapy): study protocol for a randomised controlled trial. *Trials*, 16, 349. doi:10.1186/s13063-015-0888-6
- Donoghue, K., Stallard, P., & Kucia, J. (2010). The clinical practice of Cognitive Behavioural Therapy for children and young people with a diagnosis of Asperger's Syndrome. *Clinical child psychology and psychiatry*, 16(1), 89-102. doi:10.1177/1359104509355019
- Espie, C. A., Luik, A. I., Cape, J., Drake, C. L., Siriwardena, A. N., Ong, J. C., . . . Kyle, S. D. (2016). Digital Cognitive Behavioural Therapy for Insomnia versus sleep hygiene education: the impact of improved sleep on functional health, quality of life and psychological well-being. Study protocol for a randomised controlled trial. *Trials*, 17, 257. doi:10.1186/s13063-016-1364-7
- Falconer, C. J., Davies, E. B., Grist, R., & Stallard, P. (2019). Innovations in practice: Avatar-based virtual reality in camhs talking therapy: Two exploratory case studies. *Child and Adolescent Mental Health*. doi:10.1111/camh.12326
- Gabalda, I. C. (2006). The assimilation of problematic experiences in linguistic therapy of evaluation: How did maría assimilate the experience of dizziness? *Psychotherapy Research*, 16(4), 422-435. doi:10.1080/10503300600756436
- Gorini, A., Gaggioli, A., Vigna, C., & Riva, G. (2008). A second life for eHealth: Prospects for the use of 3-D virtual worlds in clinical psychology. *Journal of medical Internet research*, 10(3), e21. doi:10.2196/jmir.1029

- Hoch, D. B., Watson, A. J., Linton, D. A., Bello, H. E., Senelly, M., Milik, M. T., . . . Kvedar, J. C. (2012). The feasibility and impact of delivering a mind-body intervention in a virtual world. *PloS one*, 7(3), e33843. doi:10.1371/journal.pone.0033843
- Honos-Webb, L., & Stiles, W. B. (1998). Reformulation of assimilation analysis in terms of voices. *Psychotherapy: Theory, Research, Practice, Training*, 35(1), 23-33. doi:10.1037/h0087682
- Humphrey, N., & Lewis, S. (2008). 'Make me normal': The views and experiences of pupils on the autistic spectrum in mainstream secondary schools. *Autism*, 12(1), 23-46. doi:10.1177/1362361307085267
- Humphrey, N., & Symes, W. (2010). Perceptions of social support and experience of bullying among pupils with autistic spectrum disorders in mainstream secondary schools. *European Journal of Special Needs Education*, 25(1), 77-91. doi:10.1080/08856250903450855
- Jackson, L. (2003). *Freaks, geeks and asperger syndrome: A user guide to adolescence*. London N1 9JB: Jessica Kingsley Publishers Ltd.
- Jones, R. S. P., Zahl, A., & Huws, J. C. (2001). First-hand accounts of emotional experiences in autism: A qualitative analysis. *Disability & Society*, 16(3), 393-401. doi:10.1080/09687590120045950
- Kavanagh, J., Oliver, S., Caird, J., Tucker, H., Greaves, A., Harden, A., . . . Thomas, J. (2009). *Inequalities and the mental health of young people: A systematic review of secondard school-based cognitive behavioural interventions*. Retrieved from London:
- Leff, J., Williams, G., Huckvale, M. A., Arbuthnot, M., & Leff, A. P. (2013). Computer-assisted therapy for medication-resistant auditory hallucinations: proof-of-concept study. *The British Journal of Psychiatry*, 202(6), 428-433. doi:10.1192/bjp.bp.112.124883
- Leiman, M. (2004). Dialogical sequence analysis. In H. J. M. Hermans & G. Dimaggio (Eds.), *The dialogical self in psychotherapy* (pp. 255-269). London: Bruner and Routledge.
- Leiman, M., & Stiles, W. B. (2001). Dialogical sequence analysis and the zone of proximal development as conceptual enhancements to the assimilation model: The case of Jan revisited. *Psychotherapy Research*, 11(3), 311-330. doi:10.1080/713663986
- Paxton, K., & Estay, I. A. (2007). *Counselling people on autistic spectrum:A practical manual*. London,N1 9BJ: Jessica Kingsley Publishers Ltd.
- Portway, S. M. (2006). *Living with Asperger's syndrome-the phenomenon of 'not quite fitting in'*. (unpublished doctoral thesis), London,UK.
- Rehm, I. C., Foenander, E., Wallace, K., Abbott, J.-A. M., Kyrios, M., & Thomas, N. (2016). What role can avatars play in e-mental health interventions? exploring new models of client-therapist interaction. *Frontiers in Psychiatry*, 7, 186. doi:10.3389/fpsy.2016.00186
- Ribeiro, A. P., Ribeiro, E., Loura, J., Gonçalves, M. M., Stiles, W. B., Horvath, A. O., & Sousa, I. (2014). Therapeutic collaboration and resistance: Describing the nature and quality of the therapeutic relationship within ambivalence events using the Therapeutic Collaboration Coding System. *Psychotherapy Research*, 24(3), 346-359. doi:10.1080/10503307.2013.856042
- Samson, A. C., Huber, O., & Ruch, W. (2011). Teasing, ridiculing and the relation to the fear of being laughed at in individuals with Asperger's syndrome. *Journal of Autism and Developmental Disorders*, 41(4), 475-483. doi:10.1007/s10803-010-1071-2
- Schielke, H. J., Fishman, J. L., Osatuke, K., & Stiles, W. B. (2009). Creative consensus on interpretations of qualitative data: The Ward method. *Psychotherapy Research*, 19(4-5), 558-565. doi:10.1080/10503300802621180

- Somerville, L. H. (2013). The teenage brain: sensitivity to social evaluation. *Current Directions in Psychological Science*, 22(2), 121-127. doi:10.1177/0963721413476512
- Stiles, W. B. (2007). Theory-building case studies of counselling and psychotherapy. *Counselling and Psychotherapy Research*, 7(2), 122-127.
- Stiles, W. B. (2009). Logical Operations in Theory-Building Case Studies. *Pragmatic Case Studies in Psychotherapy*, 5(3), 9-22.
- Stiles, W. B. (2009). Responsiveness as an obstacle for psychotherapy outcome research: It's worse than you hink. *Clinical Psychology: Science and Practice*, 16(1), 86-91. doi:10.1111/j.1468-2850.2009.01148.x
- Stiles, W. B. (2011). Coming to terms. *Psychotherapy Research*, 21(4), 367-384. doi:10.1080/10503307.2011.582186
- Stiles, W. B. (2017). Theory-building case studies. In D. Murphy (Ed.), *Counselling Psychology: A Textbook for Study and Practice* (pp. 439-452). Chichester, UK: Wiley.
- Stiles, W. B., & Angus, L. (2001). Qualitative research on clients' assimilation of problematic experiences in psychotherapy. In J. Frommer & D. L. Rennie (Eds.), *Qualitative psychotherapy research: Methods and methodology* (pp. 112-127). Lengerich, Germany: Pabst Science Publishers.
- Stiles, W. B., & Glick, M. (2002). Client-centered therapy with multi-voiced clients: Empathy with hom? In J. C. Watson, R. Goldman, & M. S. Warner (Eds.), *Client-centred and experiential therapy in the twenty first century* (pp. 406-414). Ross on Wye: PCCS Books.
- Stiles, W. B., & Horvath, A. O. (2017). Appropriate responsiveness as a contribution to therapist effects. In *How and why are some therapists better than others?: Understanding therapist effects*. (pp. 71-84). Washington, DC, US: American Psychological Association.
- Stiles, W. B., Morrison, L. A., Haw, S. K., Harper, H., Shapiro, D. A., & Firth-Cozens, J. (1991). Longitudinal study of assimilation in exploratory psychotherapy. *Psychotherapy: Theory, Research, Practice, Training*, 28(2), 195-206. doi:10.1037/0033-3204.28.2.195
- van Rijn, B., Cooper, M., & Chryssafidou, E. Avatar-based counselling for young people within school counselling. Qualitative analysis of client experience. *Counselling and Psychotherapy Research*, n/a-n/a. doi:10.1002/capr.12155
- van Rijn, B., Cooper, M., Jackson, A., & Wild, C. (2015). Avatar-based therapy within prison settings: pilot evaluation. *British Journal of Guidance and Counselling*. doi:10.1080/03069885.2015.1068273
- Wallin, D. J. (2007). *Attachment in psychotherapy*. London New York: The Guilford Press.
- Willey, L. (1999). *Pretending to be normal. Living with asperger's syndrome*. London N1 9BE: Jessica Kingsley Publishers Ltd.
- Wilson, S. (2017). *How is counselling experienced by people with As-perger's syndrome?: A qualitative study.*, University of the West of England, Retrieved from <http://eprints.uwe.ac.uk/28707/>
- Yuen, E. K., Herbert, J. D., Forman, E. M., Goetter, E. M., Comer, R., & Bradley, J.-C. (2013). Treatment of social anxiety disorder using online virtual environments in second life. *Behavior therapy*, 44(1), 51-61. doi:<https://doi.org/10.1016/j.beth.2012.06.001>

## Online Appendix Selected Scenes



**Scene 1a. Inside the secure castle walls.** *The “Secure base”. The scene within the castle walls (objectives and accomplishments).*



**Scene 1b. Spectator avatar above the castle walls.** *The Avatar's emoticon is initially neutral, later is changed to happy.*



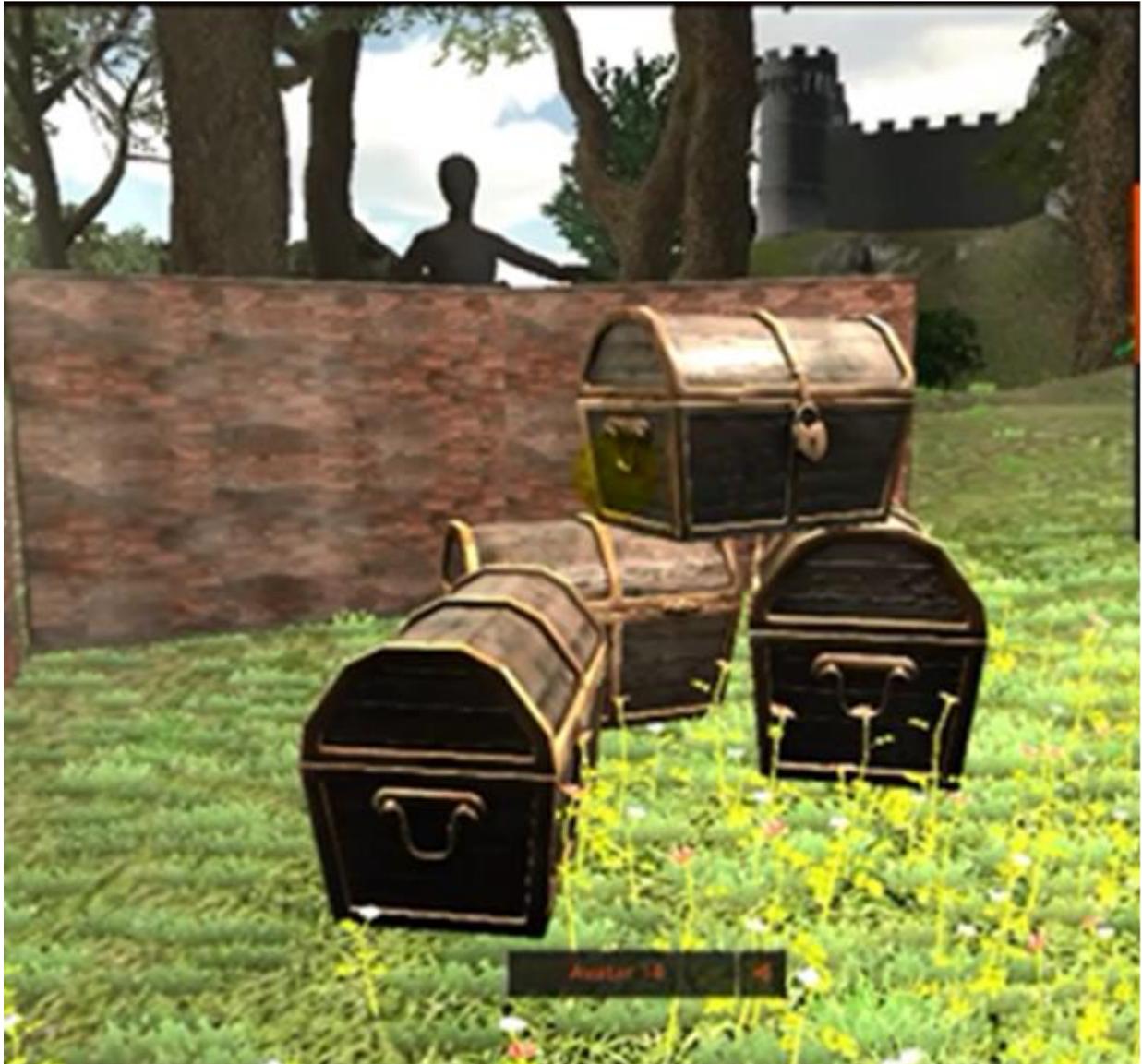
**Scene 2. Roadblocks to cope with anxiety.** Avatars *Coping* (right), with posture “not listening/avoiding”, and avatar *Anxiety* (left) with posture “criticizing”, set the scene outside the castle.



**Scene 3. Riverbank (dealing with distractibility).** *Avatar Attention overlooks treasure chests labelled 'ideas' and 'concepts'.*



**Scene 4a. The treasure of normality.** *Richard added a wall labeled 'cannot get past it', with a treasure chest behind it labelled "normal". He added a black avatar named Fitting In on the other side of the wall from the chest with a "crying and stressed emoticon", a posture of 'stressing/regretting/OMG,' and an inner voice saying, "I can see it but I cannot achieve it".*



**Scene 4b. More treasure chests.** *Richard represents his increased desire to be normal with more large treasure chests. These remain, as in the previous scene, out of reach from his avatar, which is positioned behind a wall that blocks his access.*



**Scene 5. Minefield of memories.** *Richard is looking at the scene, with the treasure chests, labelled 'good', and bombs, labelled 'bad', as Spectator Avatar.*



**Scene 6. Elephant as games server (gaming community).** *Richard chose an elephant to represent an online games server. The avatars on the back of the elephant represent other users but not his friends. He has coloured them yellow to represent a warning (like yellow chevrons) as he is apprehensive about how others will perceive him.*



**Scene 8. Games Workshop** (enclosed and secure) Richard depicts his local Games Workshop using a variety of props and avatars. Richard frequents the Games Workshop on a regular basis to participate in fantasy role-playing games and modelling.



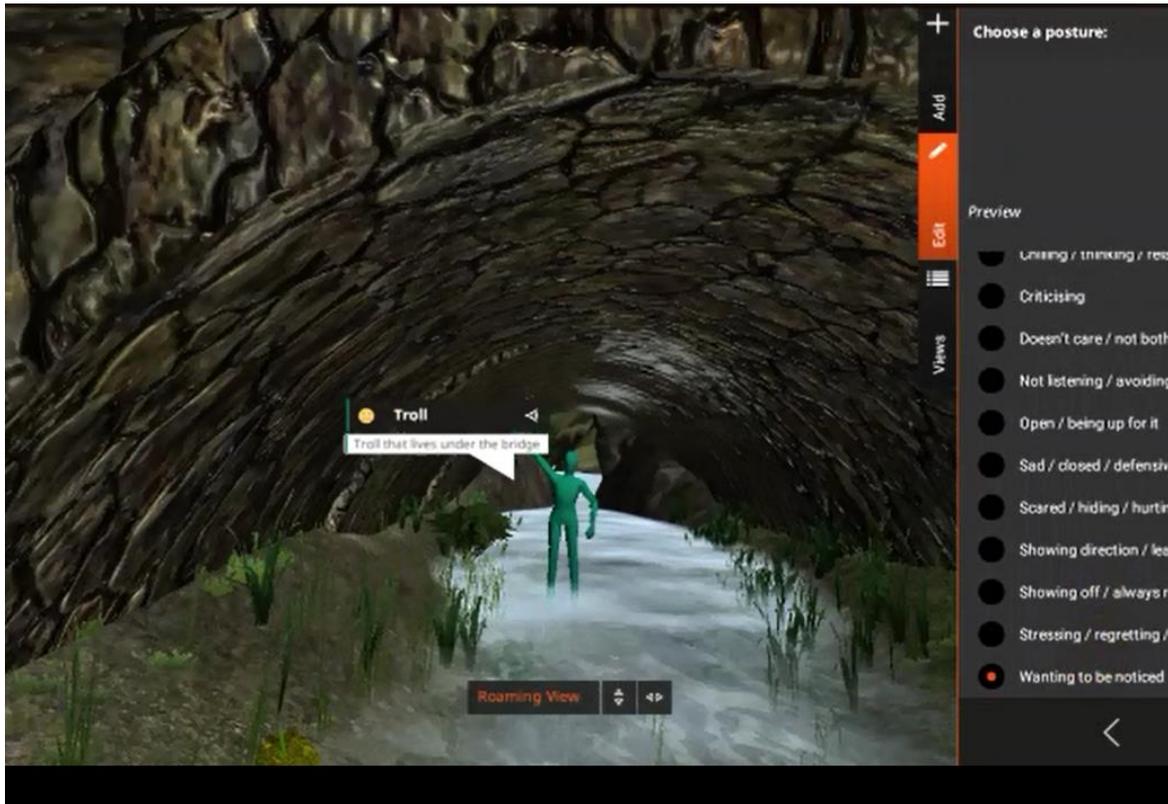
**Scene 7. Gravestones and Halloween.** *Richard represented his experience as not fitting using various props (e.g. walls, campfire) to make it look 'Halloween-ish'.*



**Scene 8. Games Workshop** (enclosed and secure) Richard depicts his local Games Workshop using a variety of props and avatars. Richard frequents the Games Workshop on a regular basis to participate in fantasy role-playing games and modelling.



**Scene 11a. The tunnel.** Richard build the tunnel out of a series of bridges over the river.



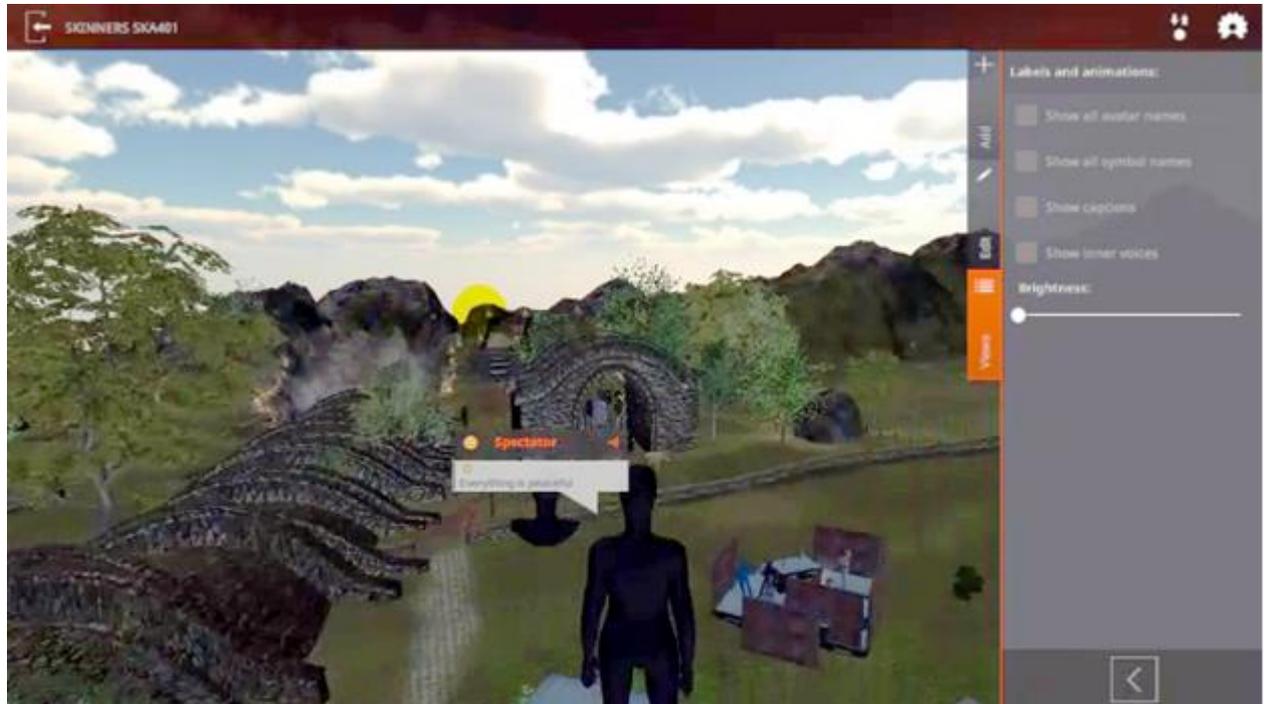
**Scene 11b Angry troll in the tunnel.** *Richard placed an avatar, which he named Troll, under a bridge tunnel that he created. He added the behaviour 'wanting to be noticed' to his troll avatar. Later on Richard changed this label to 'angry/raging'.*



**Scene 12. Dancing around the fire (friends as health boosts).** *Richard recreated a scene from his online game with friends that depict their game avatars dancing around a fire, which also gives the characters a 'health boost'. Richard's avatar is given the behaviour 'celebrating/cheering', one friend is given the behaviour 'showing direction/leading' and the other friend is given the behaviour 'open/being up for it'.*



**Scene 13a. Monument and mirror.** *Using all the props, including the mirror, to build a “monument” in Session 21.*



**Scene 13b Everything is peaceful.** *The avatar Spectator's view from standing on the castle wall in Session 21.*