My avatar is pregnant! Representation of pregnancy, birth, and maternity in a virtual world

Anna M. Lomanowska [a,b,c], Matthieu J. Guitton [a,b,*]

[a] Institut Universitaire en Santé Mentale de Québec, Quebec City, QC, Canada
[b] Faculty of Medicine, Laval University, Quebec City, QC, Canada
[c] School of Psychology, Laval University, Quebec City, QC, Canada

ARTICLE INFO

ABSTRACT

Despite the potential for limitless creativity, many activities observed in the increasingly popular multi-user virtual worlds involve recreating real-life experiences. This is particularly evident in the social domain, as individuals reenact activities that reflect real human social needs, such as interpersonal intimacy. Surprisingly, one aspect of virtual experience tied to intimate relationships that has emerged in this context involves the reenactment of pregnancy, birth and maternity. The aim of this study was to examine how pregnancy, birth, and maternity are represented in a virtual world. Quantitative and qualitative data were collected over a 10 month period in the popular virtual world of Second Life to investigate the individual, social, and environmental aspects of these activities. Four different themes related to pregnancy, birth, and maternity were identified, including medical clinic services, family activities, sexual activities, and retail, with participation varying between female and male avatars. Analysis of related online media external to the virtual world provided further insight into the way that virtual pregnancy, birth, and maternity were constructed and experienced by the participating individuals. These insights are particularly valuable for understanding how intimate aspects of social interactions can be represented in immersive virtual applications for health care and related domains.

© 2013 Elsevier Ltd. All rights reserved.

1. Introduction

Online multiuser three-dimensional (3D) virtual worlds have become popular settings where users can engage in activities that are unhindered by many of the physical constraints and social barriers of the real world (Bainbridge, 2007; Blascovich & Bailenson, 2011; Lomanowska & Guitton, 2012b). Although many activities fall in the realm of fantasy, much of virtual life is rooted in recreating real-life experiences, with various degrees of realism, accuracy, as well as embellishment (Gottschalk, 2010; Guadagno, Muscanell, Okdie, Burk, & Ward, 2011a; Pace, Bardzell, & Bardzell, 2010; Taylor, 2002). In particular, the reenactment of real-life social interactions that reflect human social needs, including friendship, relational intimacy, sexual interactions, and belonging to a community or group, underlies the realism of many activities within these virtual worlds (Gottschalk, 2010; Guitton, 2011, 2012a, 2012b; Pace et al., 2010; Taylor, 2002). The experiences of virtual life are also supported and reinforced by broadcasting and sharing virtual activities beyond the confines of the virtual world through other online media, including blogs, video diaries, or community discussion boards and news sites (Guitton, 2012a). This form of sharing may lend more authenticity and recognition to virtual activities outside of the original virtual environment and contribute to the global stability and strength of virtual communities (Guitton, 2012a). As real and virtual experiences become increasingly integrated, especially with respect to interindividual contact and social engagement, it is important to understand the way in which real-world activities and behaviors are represented in virtual world settings.

While much of the research on human behavior in virtual worlds has focused on group dynamics (Chen & Borner, 2005; Chen, Sun, & Hsieh, 2008; Ducheneaut, Yee, Nickell, & Moore, 2006; Guitton, 2012b; Lomanowska & Guitton, 2012a; Lortie & Guitton, 2011, 2012; Zhong, 2011), there has also been increasing interest in the formation and maintenance of intimate relationships in this context (Gilbert, Murphy, & Clementina Ávalos, 2011; Pace et al., 2010; Whitty, 2013; Zhou, Jin, Vogel, Fang, & Chen, 2011). This interest reflects the increasing popularity of using digital technologies for intimate social interactions via the Internet and mobile devices (Ross, 2005; Scott, Mottarella, & Lavooy, 2006; Strassberg, McKinnon, Sustaíta, & Rullo, 2013; Valkenburg & Peter, 2011; Whitty, 2008). The presence of well-detailed human-like avatars coupled with advanced animation

* Corresponding author. Address: Institut Universitaire en Santé Mentale de Québec, 2601, chemin de la Canardière, F-6517, Québec, QC G1J 2G3, Canada. Tel.: +1 418 663 5747; fax: +1 418 663 5971.
  E-mail address: matthieu.guitton@fmed.ulaval.ca (M.J. Guitton).

technologies reinforce the possibility of intimate connection in virtual worlds compared to other online media (Bardzell & Odom, 2008; Giard & Guitton, 2010; Guadagno, Swinth, & Blascovich, 2011b; Lomanowska & Guitton, 2012a, 2012b). Interestingly, virtual relationships can be as meaningful as those established in the real world, and they can often transition from the virtual to the real world or be maintained in parallel across these two spheres (Gilbert et al., 2011; Pace et al., 2010). In the real world, one of the corollaries of intimate relationships is the explicit or implicit goal of procreation. Surprisingly, despite the limitations of virtual intimate interactions with respect to physical procreation, this goal and related activities can also be reenacted in the virtual context. Indeed, pregnancy, birth, and maternity/parenthood have emerged as part of the virtual experience. In the context of the growing presence of virtual worlds in modern society, the aim of the present study was to examine how activities related to pregnancy, birth, and maternity are represented in the virtual world and how they are experienced by participating individuals.

As very little is known about the representation of pregnancy, birth, and maternity in virtual environments, this study used a virtual anthropology approach (Ducheneaut et al., 2006; Guitton, 2012b; Taylor, 2002) to investigate the individual, social, and environmental aspects of these activities within a virtual world and its related online media. The online virtual world of Second Life was selected as a model virtual setting due to several characteristics that make it particularly suitable for this study. This virtual world has been in existence for 10 years and has reached relative stability in both the size the population of active users and their demographic characteristics (Bainbridge, 2007; Lomanowska & Guitton, 2012a; Zhou et al., 2011). Second Life is not based on any predefined narrative that users are required to adhere to and they are free to select their activities based on their personal interests (Guitton, 2011, 2012b). Much of the virtual content in this setting is designed by users, including the existing environments, avatars (3D graphical representations of the users), interactive animations of avatars, as well as numerous applications and virtual objects that can be used to customize the virtual experience (Gottschalk, 2010; Guitton, 2011; Lomanowska & Guitton, 2012b; Shelton, 2010; Zhou et al., 2011). Therefore, activities within this virtual world reflect the individual and collective interests, needs, and desires of participants providing an ideal environment to investigate the way in which the portrayal of pregnancy, birth, and maternity has emerged within a virtual setting.

2. Methods

2.1. Study design

A virtual anthropology approach was used in this study in order to gain a broad understanding of behavior related to pregnancy, birth, and maternity in a virtual world. Quantitative data and qualitative observations were collected from the virtual world of Second Life (www.secondlife.com) as well as from derived external sources available on the Internet (Bardzell & Odom, 2008; Ducheneaut et al., 2006; Guitton, 2012a, 2012b). To enter and explore the virtual world of Second Life, neutral observer avatars were used (Ducheneaut et al., 2006; Guitton, 2012a, 2012b). While observing, these avatars did not actively participate in activities and communities involved in virtual pregnancy, birth, and maternity. Observations were also performed outside of the world of Second Life by searching online materials, including blogs, videos and journalistic reports related to the experience of pregnancy, birth, and maternity in Second Life. Virtual world-related communities use various Internet media to "broadcast" their experiences, which results in a more wide-ranging virtual phenomenon (Guitton, 2012a). All data

were collected over an extended observation period from March 2012 to December 2012.

2.2. Observations within the virtual world of Second Life

2.2.1. Selection of locations of interest

To observe the activities and behaviors related to pregnancy, birth, and maternity within the virtual world of Second Life, locations of interests were identified using the keywords "pregnancy" and "maternity" in the embedded search engine of the Second Life interface. The search was specific to virtual places (3D simulations or "SIMs") that users can visit to engage in different types of activities, with the filter set to permit results in all maturity rating categories, i.e., including "general", "mature", and "adult" content. The results of the search provided information regarding the name of the SIM, its primary self-described purpose, theme, services and activities offered, as well as its "traffic", an indicator of the popularity of the SIM, which is a function of the cumulative number of minutes spent by all visitors in the SIM in any given 24 h period. The results of the keyword search were collected over the entire observation period.

2.2.2. Characterization of activities

Following the first six months of observations, the top ranking SIMs under the keywords "pregnancy" and "maternity" (consistently in the top 20% by traffic) were used to identify the main themes related to the activities available in these SIMs. These themes were identified based on the SIM descriptions as well as by visiting them and observing the environment and avatars. All activities were found to represent one of four themes: medical clinic services, sexual interactions, family interactions, and retail/shopping. Overlap between themes within a SIM was also noted. The following criteria characterized the respective themes:

Medical clinic services (clinic)–Advertising of medical services related to prenatal care, labor, delivery and post-natal/pediatric care. Presence of medical equipment and/or dedicated space to carry out these advertised services.
Family interactions (family)–Advertising of family activities related to infants and children. Presence of public spaces that support family interactions, such as playgrounds, picnic areas, or other spaces decorated to be attractive for families with young children.
Sexual interactions (sexual)–Advertising of activities related to sexual intercourse, breeding, or impregnation. Presence of public spaces explicitly devoted to engagement in these activities.
Retail/shopping (retail)–Advertising of retail as the primary function of the virtual space. Majority of the space devoted to selling virtual goods and services, with clear displays of items for sale.

A retrospective classification of all the SIMs appearing under the search "pregnancy" and "maternity" was conducted at the end of the observation period (December 2012) according to the main themes described above. The aim was to assess the total number of SIMs representing each theme. The SIMs appearing in the search results on two separate days, one day per keyword, were analyzed based on their description and the features of the virtual environment to determine their classification.

2.2.3. Assessment of popularity

In order to assess the popularity of activities related to the main themes described above, each SIM's traffic and persistence over the duration of the entire observation period was assessed by randomly selecting two days within each observation month when data was collected, then averaging these data for each measure. Data for SIMs characterized by the same themes were then