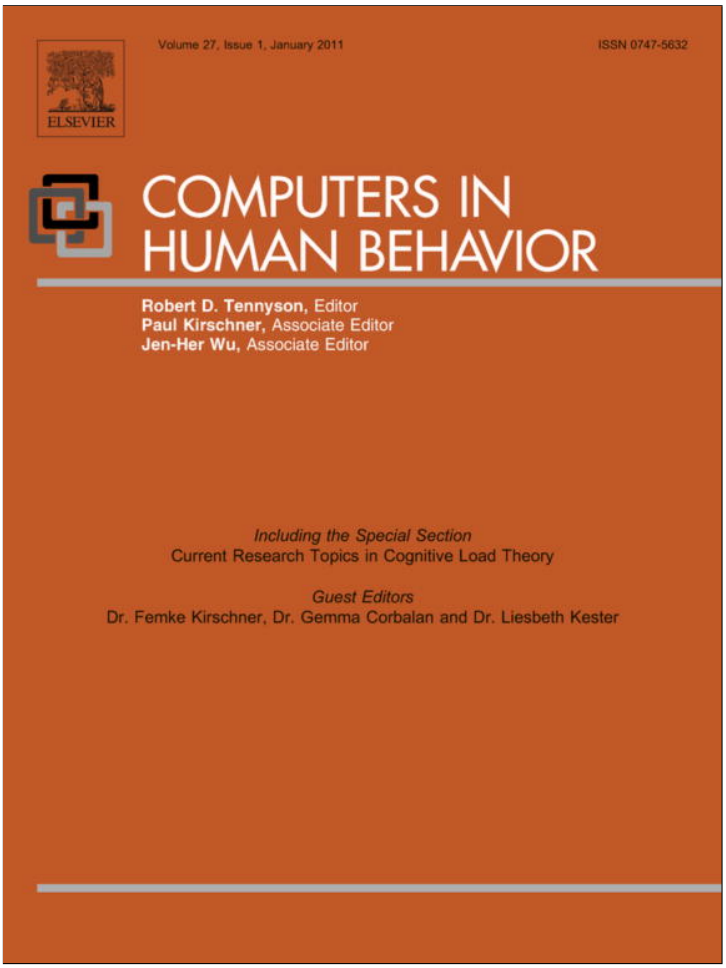

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Even in virtual environments women shop and men build: A social role perspective on Second Life

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ABSTRACT

The present study examined whether traditional gender role expectations (Eagly, 1987) influence behaviors in non-traditional contexts such as online virtual environments. Participants were 352 Second Life users who reported their activities and experiences in Second Life. Results indicated that men and women differed in the types of activities they engaged in a manner predicted by social role theory. Specifically, as compared to women, men were more likely to report building things (e.g. objects), to own and work on their own virtual property, and were less likely to change their avatar's appearance. Women, as compared to men, were more likely to meet people, shop, regularly change their avatar's appearance, and buy clothes/objects for their avatar. The present study adds to our understanding of how traditional gender role expectations may carry over to online virtual worlds and influence online behavior.

The ability to control the way an individual represents him- or herself is one of the key features of the Internet (McKenna & Bargh, 2000). Indeed, since the early days of the Internet, individuals have been interacting with others through virtual representations of themselves (See Turkle, 1995 for a review). The particulars of the online forum and type of virtual representation range from chat rooms (text-based screen name identity) to massively multiplayer online role-playing games (MMORPGs), such as *World of Warcraft* (3-D virtual representation of a humanoid called an avatar). The prevalence of the latter type of virtual representation is the focus of the present investigation. Specifically, this study examined how individuals spend their time in the online virtual environment called Second Life (Linden Research Inc., 2008) to determine if men and women differ in their activities and experiences.

1. What is a virtual environment?

Broadly defined, a virtual environment is a synthetic representation of a natural or imagined environment (Biocca & Levy, 1995; Blascovich et al., 2002; Kalawsky, 1993; Lanier, 2001). Digital virtual worlds can be two- or three-dimensional representations of a space (planet, room, meadow, etc.) containing objects (car, flower, table, etc.) and representations of humans. The latter can be online representations of actual persons (called avatars) or computer algorithms simulating persons (called agents). Individuals in an immersive virtual environment (IVE) typically experience visual aspects of the virtual world via a computer screen although they can also be immersed in the environment by wearing a controlled head-mounted display (HMD) that projects the world stereoscopically.

2. Second Life

Second Life is a fictional 3-D virtual world entirely created by its users (Linden Research Inc., 2008). It provides an advanced interactive level of social networking where individuals (through embodied virtual representations of themselves called avatars) can explore virtual worlds and properties, socialize, and participate in individual and group activities. While Second Life has the ability to be used as an online game, it is primarily a virtual social networking environment where individuals can engage in a wide variety of activities: attend concerts and lectures, shop, take classes, engage in religious worship, and meet new people (Boellstorff, 2008).

3. Gender differences in online behavior

Research generally indicates that men and women differ in the way they spend their time online (Li & Kirkup, 2007). For instance, Weiser (2000, 2001) reported that men, compared to women, are more likely to use the Internet to search for dates, read the news, look for job leads, get sports and financial information, read politics, and to play games, whereas women, compared to men, are

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more likely to use it for interpersonal communication (email, chatting, etc.) Similarly, Fallows (2005, December) replicated the above results and also reported that men are more "intense" users as illustrated by the findings that men, relative to women, are online more often, have faster Internet connections, are more likely to access the Internet from home, search for a wider variety of information, and play more online games.

Research on gender differences in virtual environments such as MMORPGs indicates that women and men have different goals and engage in different activities while interacting with virtual humans. Specifically, women engage in more social interaction and cooperative activities than men (Lucas & Sherry, 2004; Yee, 2006b). Other research has revealed that men and women differ in their motivations for spending time in online virtual environments such as MMORPGs. Specifically, Yee (2006a) reported that in a survey of MMORPG players, men scored higher in achievement motivation (advancement, game mechanics, competition) for playing, whereas women scored higher in social motivations (relationships, teamwork) for playing. There was no difference in the amount of socializing. However, they reported that men and women's reasons for socializing differed. Finally, Williams, Consalvo, Caplan, & Yee (2009) replicated the gender differences in motivations for playing and also reported that women gamers spent more hours playing than did their male counterparts.

4. Social role theory

What can account for the gender differences in online behavior reviewed above? These behaviors are consistent with expectations for gendered behavior according to social role theory (Eagly, 1987). Social role theory indicates that men and women occupy different roles in society with men primarily serving the role as provider and women primarily serving the role as caregiver. Through these roles, men and women learn different skills and beliefs that impact their social behavior. Because of these different social roles, men and women are also subject to different normative expectations for behavior. These factors lead to gender differences in actual behavior. Specifically, men typically behave and are expected to be more *agentic* (e.g., assertive, controlling, independent) and women typically behave and are expected to be more *communal* (e.g., concerned for the welfare of others, interpersonally sensitive, emotionally expressive). Related to gender differences in online behavior, social role theory (Eagly, 1987) provides an explanation for why women report engaging in more social behavior online: forming and maintaining relationships is a communal activity. Conversely, the online behaviors men report engaging in are focused on independence and competition, which are agentic activities.

5. The present study

To date, we are unaware of any research that has assessed whether or not gender differences in behavior exist in Second Life. As such, the present investigation sought to examine this question. Specifically, we analyzed data from a survey collected by the New Media Consortium (NMC) in 2008 to determine the interests, demographics, and activities of more than 300 educators involved with Second Life. In examining these data, we refer to different expectations in social role as gender differences. This differentiates from sex differences in that sex refers to the physiological and biological aspects of being female or male, while gender is indicative of the non-biological characteristics (i.e., cultural and social expectations) of being a woman or a man (Unger, 1979).

5.1. Predictions

Based on the literature reviewed above, we expected to find gender differences in online behavior experiences that were consistent with social role theory (Eagly, 1987). Specifically, we expected to find that men and women would report differences in their behavior while in Second Life that correspond to gender differences in behavior typically found outside a virtual environment. As a result, we expected to find a greater proportion of men than women engage in agentic behavior that involved more independent and tasked focused activities. Similarly, we expected to find that a greater proportion of women than men engage in communal behavior that is oriented toward socializing and other communal activities.

5.2. Participants

A total of 352 participants completed the NMC survey (143 men, 209 women) completed the New Media Consortium (NMC) Second Life Survey. Participants' ages ranged widely from 18 to 55 or greater, with most participants' ages ranging between 46 and 55 years. Ethnicity was unreported. All 352 participants were Second Life users.

5.3. Procedure

During May 2008, email invitations were sent to individuals on the New Media Consortium's (NMC) list of contacts, the Second Life Educators Listserv (SLED) and to individuals who had elected to be listed in the NMC Campus Online Directory (http://sl.nmc.org/directory/). In addition, notices were sent within Second Life to the members of the NMC Guests and NMC Members groups. Participants were sent an email inviting anyone involved with Second Life to complete the NMC's annual survey of Educators in Second Life. The email informed participants that the goal of the survey was to help learn more about the people, projects, and interests of those using Second Life for teaching and learning. Participants were then directed within the email invitation to a hyperlink leading to the online survey. Participants volunteered to complete the survey from a computer of their choice.

5.4. Measures

NMC Second Life survey[1]. The NMC Second Life survey was a comprehensive survey designed to gain insight about the work of individual educators, specifically in the context of a new-media-related topic (Second Life). The survey was designed to gather information on the activities, attitudes, and interests of educators active in Second Life. It consisted of 42 questions pertaining to individuals' use of Second Life for teaching and learning purposes. The survey covered a variety of topics involving the use of Second Life, including demographic variables (e.g. gender) and general technological questions (e.g. "*How many computers do you own?*"). More importantly, it assessed individuals' experience level with games/technology (e.g. "*Other than Second Life, have you participated in other virtual environments*?"), individuals' experience level with Second Life (e.g. "*What kinds of educational activities have you done in Second Life?*"), and how individuals use Second life in general (e.g. "*What kinds of general activities have you done in Second Life*?"). Additionally, the survey contained questions about personal experiences in Second Life (e.g. "*What kinds of items have you purchased in Second Life?*"), professional experiences in Second Life (e.g. "*Please describe how your pro-*

[1] We were interested solely in gender differences in Second Life behaviors and activities. Therefore, the results reported only pertain to survey questions relevant to Second Life usage.

Table 1
Gender differences in behavior reported by Second Life users.

Activities/behaviors	Men (%) (n = 143)	Women (%) (n = 209)	X^2
Engagement in masculine-typed activities and behaviors in Second Life by men and women			
Building things	76.2	56.9	16.28***
Using non-human avatar	15.4	5.7	9.83**
Using avatar of opposite gender	9.8	5.7	7.44*
Owning/working on own property	58.7	45.9	11.74**
Engagement in feminine-typed activities and behaviors in Second Life by men and women			
Meeting new people	78.3	86.5	7.39*
Shopping	53.1	64.1	5.92*
Changing avatar appearance	23.1	49.3	25.88***
Buying cloths, objects, skins	69.9	79.4	6.16*

* $p \leqslant .05$.
** $p < .01$.
*** $p < .001$.

fessional network expanded or what professional gains, if any, you have made by being in Second Life"), and the Second Life environment (e.g. "*How do you feel about companies marketing their products and services in Second Life*?"). Finally, the survey asked participants to provide open-ended descriptions about their most positive and negative experiences using Second Life.

6. Results

6.1. Overview of the general data analysis

We conducted a series of Chi-square tests to determine whether or not there were any gender differences in the frequency and type of behaviors and activities that participants reported engaging in Second Life. Only significant gender differences are reported. Results are organized by whether or not the analyses were performed on participants' self-reported behavior vs. open-ended responses, and also by gender differences indicating more masculine (agentic) vs. more feminine (communal) behavior.

For the open-ended responses, participants were asked to describe their most positive and negative experiences in Second Life. Two independent raters categorized these responses as communal, agentic or not applicable. Examples of responses coded as communal included: "meeting interesting people; meeting people from all over the world; and attending conferences." Examples of responses coded as agentic included: "flying; building successfully; curating an art show." Finally, missing data, incomprehensible responses and responses that did not fit within the social role theory (Eagly, 1987) framework were coded as not applicable. Overall, inter-rater reliability was high for both positive (r = .90) and negative (r = .81) experiences.

6.2. Gender differences in agentic behavior

Several results demonstrated gender differences that were an indication of more masculine-typed, agentic behaviors in Second Life. Specifically, there was a significant relationship between gender and building things in Second Life, $X^2(2, N = 352) = 16.28$, $p < .001$, $\varphi = .21$. As seen in Table 1, more men (76.2%) reported that they build things in Second Life compared to women (56.9%). There was also a significant relationship between gender and whether or not an individual's avatar was non-human, $X^2(2, N = 352) = 9.83$, $p = .007$, $\varphi = .17$. More men (15.4%) represented themselves with a non-human avatar (e.g. a robot) in Second Life compared to women (5.7%). Additionally, there was a significant relationship between gender and whether or not an individual reported gender bending (appears or sometimes appears as the opposite gender in Second Life), $X^2(2, N = 352) = 7.44$, $p = .02$, $\varphi = .14$.[2] More men (9.8%) reported using an avatar of the opposite gender compared to women (5.7%). Furthermore, there was a significant relationship between gender and whether or not an individual owns/works on his or her own property in Second Life, $X^2(2, N = 352) = 11.74$, $p = .003$, $\varphi = .18$, indicating that more men (58.7%) own and work on their on property in Second Life compared to women (45.9%).

6.3. Gender differences in communal behavior

Several of the results demonstrated gender differences that were an indication of more feminine-typed behavior in Second Life. Specifically, there as a significant relationship between gender and meeting new people in Second Life, $X^2(2, N = 352) = 7.39$ $p = .03$, $\varphi = .14$. Table 1 shows that more women (85.6%) reported using Second Life to meet new people compared to men (78.3%). There was also a significant relationship between gender and shopping in Second Life $X^2(2, N = 352) = 5.92$ $p = .05$, $\varphi = .13$. Table 1 shows that more women (64.1%) reported that they shop in Second Life compared to men (53.1%). This is consistent with prior literature demonstrating that, due to the common practice of women shopping in groups, shopping is a communal behavior (Evans, Christiansen, & Gill, 1996). There was also a significant relationship between gender and whether or not an individual changed his or her avatar's appearance in Second Life, $X^2(2, N = 352) = 25.88$, $p < .001$, $\varphi = .27$ indicating that more women (49.3%) reported that they change their avatar's appearance and have multiple outfits and representations for their avatars as compared to men (23.1%). Additionally, there was a significant relationship between gender and buying clothes/objects/skins for an avatar's appearance, $X^2(2, N = 352) = 6.16$, $p = .04$, $\varphi = .13$ indicating that more women (79.4%) reported buying clothes, objects, and skins for their avatar's appearance in Second Life compared to men (69.9%).

6.4. Open-ended responses

Finally, we examined the open-ended items in which participants reported their most positive and most negative experiences while using Second Life. For the most positive experience using Second Life, our results revealed a significant gender difference indicating that women, relative to men, reported more communal experiences and men, relative to women, reported more agentic experiences, $X^2(2, N = 352) = 30.33$, $p < .001$, $\varphi = .294$. Men and

[2] We also examined our data to see if any of our results varied within the group of individuals who reported gendering bending. These results did not yield any significant differences.

Table 2
Gender differences in the most positive and most negative experience while using Second Life, as categorized into communal, agentic, and not applicable experiences.

	Communal	Agentic	Not applicable
Most positive experience			
Men	50.3% (72/143)	45.5% (65/143)	4.2% (6/143)
Women	60.3% (126/209)	21.5% (45/209)	18.2% (38/209)
Most negative experience			
Men	33.6% (48/143)	23.1% (33/143)	43.3% (62/143)
Women	38.8% (81/209)	23.0% (48/209)	38.3% (80/209)

women did not differ in their descriptions of their most negative experiences using second life, $X^2(2, N = 352) = 1.17$, $p = .56$, $\varphi = .058$. see Table 2 for details of these results.

7. General discussion

Overall, the results of this survey of Second Life users provide support for the social role theory (Eagly, 1987) prediction that individuals behave in ways consistent with traditional gender role expectations, even in non-traditional settings such as a virtual world. Specifically, our results indicated that, overall, women reported engaging in more communal activities (e.g., meeting people, shopping) relative to men while using Second Life, and men reported engaging in more agentic activities (e.g., building things, owing and working property) relative to women. Furthermore, when describing their most positive experiences, women reported more communal experiences and men reported more agentic experiences.

Although these results are the first illustration of gender differences in behavior and experiences in Second Life, they are also consistent with the overall set of research findings on gender differences in behavior in Internet use and in online gaming. Additionally, these results illustrate an interesting aspect of the research emerging from online virtual environments indicating that even when men and women have the freedom to behave in a manner that is inconsistent from societal-based expectations for gendered behavior, men and women still appear to choose to behave in ways that confirm these expectations.

While some of the gender differences in behavior (e.g., shopping, gender bending, and non-human avatar use) reported in this study may seem inconsistent with social role theory (Eagly, 1987), we believe that all the gender differences reported fit within this framework. For instance, women in this study reported engaging in more shopping than did men while in Second Life. Shopping is a social behavior and one that is often accomplished in groups and is generally considered a communal behavior in the literature both in that people often shop in groups and that it is a behavior that is more commonly associated with the feminine gender role (Evans et al., 1996; Fischer & Arnold, 1990). Similarly, the prevalence of gender bending and representation as non-human avatars reported by the men was categorized as an agentic behavior because we perceived it as a means of establishing independence by creating an avatar with a different appearance. Furthermore, this finding is consistent with results from many, studies of online behavior (Boellstorff, 2008; Turkle, 1995) and may also reflect a difference in the extent to which men and women engage in online role-playing. In line with this notion is research by, Whitty and Carr (2005, 2006) in which they argue that the Internet provides individuals with an opportunity to engage in roles they do not or cannot adopt in an offline context. Future research should examine whether men and women vary in the extent to which they enjoy role-playing online as a potential explanation for this finding.

The implications for these findings are that gendered behavior may be so ingrained in most individuals that they will not alter their behavior even in an environment where there are no repercussions for doing so. It may also be that individuals perceive that there would be repercussions for violating gender role expectations in online virtual environment – future research should address this question.

7.1. Limitations and future directions

One limitation of the present investigation is that the results were produced from self-report data. As such, it remains an open question whether the gender differences revealed in our analyses reflect actual differences in behavior or biases in reporting due to perceived social desirability to respond in a manner consistent with gender stereotypes. Future research should address this limitation by conducting experimental investigations of gendered behavior in online virtual environments.

Future research should continue to examine the ways in which gender impacts behavior in Second Life. For instance, research suggests that personality may interact with gender and impact the way in which men and women spend their time online. Specifically, research suggests that introverts may use the Internet to express their true self (Bargh, McKenna, & Fitzsimons, 2002) while extroverts may use the Internet to broaden an already broad social network (Kraut, Kiesler, Boneva, Cummings, & Helgeson, 2002). Additionally, Hamburger and Ben-Artzi (2000) examined individual differences in Internet usage of extroverts and neurotics to see if those low in extroversion (i.e., the introverts) and those high in neuroticism would be more likely to use the social services (e.g., seeking people, chatting, participating in discussion groups) of the Internet. They found support for this hypothesis but only among the women in the sample. Men who were extroverted were more likely to use leisure services and those men who were high in neuroticism were less likely to use information services. Although the results varied by gender, overall, these results provide evidence for the idea that personality may moderate the types of Internet usage individuals engage in.

Along these same lines, Amachai-Hamburger and Ben-Artzi (2003) reported similar patterns of Internet use for men and women as reported above indicating that neuroticism was significantly correlated with loneliness. These authors also reported that, for women, loneliness mediates the relationship between neuroticism and Internet use. This provided evidence that lonely women use the Internet to assuage their loneliness and not the reverse relationship. More relevant to the present investigation, this research suggests that neuroticism may be one individual difference characteristic that predicts the likelihood of blogging, particularly for women (Guadagno, Okdie, & Eno, 2008). This is particularly relevant to bloggers as demographic data indicate that, while most blogs contain personal information, women and teenagers are more likely to blog on personal topics (Herring, Scheidt, Wright, & Bonus, 2005).

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