

Prosocial behaviour in avatar-mediated interaction: the influence of character gender on material versus emotional help-giving

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Abstract

Purpose – Research on prosocial behaviour shows that help-giving differs between the sexes. Gender role theory posits that males specialise in material aid, while females specialise in emotional support. Today, people increasingly help and support each other via online environments. The purpose of this study is to examine whether the genders of avatars used in online interactions influence help-giving behaviour in similar ways as physical sex does in face-to-face situations.

Design/methodology/approach – An empirical study was conducted using a unique observational data set from a Japanese massively-multiplayer online game. Instances of help-giving were identified from conversation logs, coded, and analysed statistically to discover differences between male and female avatars and different help types.

Findings – Avatar gender is found to influence help-giving in ways that deviate from expected gender roles: female avatars are more likely than males to provide assistance in the form of material support and labour, and no more likely than males to provide emotional support. Female avatars are more likely to give help to male avatars than other females. The results are explained using behavioural confirmation and self-perception theory.

Research limitations/implications – Physical sex was not controlled for, but most players were male. The study should be repeated in other environments.

Practical implications – The results suggest that designers can prime users towards prosocial behaviours by tuning the available line-up of avatars.

Originality/value – The research question and use of observational data are novel. The study is valuable to online educators, companies seeking to reduce customer support costs through peer help, and policymakers dealing with ICTs and societal change.

Keywords Gender, Behaviour, Social interaction, Social networking sites

Paper type Research paper

Introduction: the importance of digital helping behaviour

Peer groups such as neighbourhoods and extended families that traditionally offered help and support to their members are today challenged by processes of urbanisation and labor mobility (Putnam, 1995, 2000). Instead, different kinds of help and support are increasingly provided in online peer groups (Rheingold, 2000; Steinkuehler and Williams, 2006; Greenhow, 2011). But the adoption of computer-mediated tools and environments for working, learning and conducting social lives has itself also created a massive new need for help in how to use these systems. The more this need can be addressed by peer help, the less need there is for companies and the society to expend resources on professional assistance. What factors influence the likelihood of peer-to-peer help-giving in online environments is therefore an important research question from societal as well as business perspectives.

Gender has been found to have a strong bearing on helping behaviour. What research exists on help-giving in computer-mediated environments suggests that gender also plays a part in online helping (Wang and Wang, 2008). However, in online environments, participants often have the possibility of presenting themselves in the guise of a gender that differs from their physical sex. In online games and virtual worlds, this typically happens through the use of an avatar: a character that represents the user in the virtual environment. Surveys suggest that a significant proportion of users use avatars of the opposite gender (Hussain and Griffiths, 2008; Roberts, 1999; Yee, 2007). For this and other reasons, it is not clear whether previous findings on helping behaviour apply in avatar-mediated communication.

Another gap in the literature relates to the different types of help-giving behaviour that are possible in online environments. Many of the most popular digital hangouts today, such as online games and social networking sites, incorporate so-called virtual goods and currencies that must be possessed for certain interactions to be possible. A key feature of these resources is that they are rivalrous: giving away one's goods to another user results in the original possessor losing them (Fairfield, 2005). While prosocial behaviour in online environments was previously about sharing information and emotional support, it is now also common for participants to give each other "material" support and gifts in the form of virtual items and currencies that have come to be regarded as powerful enablers and status symbols (Lehdonvirta, 2010; Lehdonvirta *et al.*, 2009). This material form of online help-giving has not been addressed in previous research.

In this study, we use a unique observational data set from the Japanese massively multiplayer online game (MMO) "Uncharted Waters Online" to examine how help-giving in an avatar-mediated environment is influenced by gender and type of help. Understanding peer-to-peer helping in online games is particularly important, because customer service is often the single biggest expense in operating an online game (Mulligan and Patrovsky, 2003; Plunkett, 2008). The paper is structured as follows. In the following section, we review the previous literature on helping behaviour, gender and computer-mediated communication to derive hypotheses concerning help-giving in avatar-mediated interaction. In the subsequent sections, we then describe an empirical study to test these hypotheses. In the final section, we present conclusions and discuss the implications of the study. The results suggest that avatar gender matters strongly in helping behaviour, but not quite in the ways that were expected.

Helping behaviour, gender and digital environments

Research on helping behaviour in social psychology extends back to the 1950s. It focuses on such questions as what individual and socio-demographic characteristics predict occurrences of help and how helping behaviour differs based on the type of help (Blau, 1955; Amato, 1985; Shotland and Stebbins, 1983; Eagly and Crowley, 1986; Dovidio *et al.*, 2006). Studies focusing on individual differences in helping behaviour have found that sex influences helping propensity in complex ways. Studies focusing on short-term encounters with strangers have found that males are in general more helpful than females (Eagly and Crowley, 1986), while women are more likely to give help in the form of emotional support, especially to their male friends (Kuttler *et al.*, 1999). Males seldom provide emotional support to same-sex friends, but in a male-dominated environment, statements by women receive a quick response (Rollman *et al.*, 2000).

These findings can be made sense of through the lens of gender role theory (Lindsey, 2005). This theory suggests that the male gender role fosters visible, heroic and material help-giving, while the female gender role encourages nurturing, caring and empathy (Eagly and Crowley, 1986). In families and close communities, the male role may moreover include the role of a "breadwinner": working outside the house and distributing the material fruits of labour to others. Besides gender role theory, alternative approaches to understanding sex differences in helping behaviour can be sought in physiological differences and the evolutionary psychology thesis. For example, women might be less predisposed to help strangers because of the greater risk of physical assault that it entails to them (Shotland and Stebbins, 1983; Takagi, 1998).

In recent years, online social behaviour has arguably become a significant component of the society at large. For instance, over 75 percent of Japanese use the internet regularly, and surveys suggest that almost half of the regular users participate in various kinds of online communities (Ishii and Ogasahara, 2007). Online games are another extremely popular social activity online (Dentsu Communication Institute and Media Development Research Institute, 2009). In accordance with these trends, research on prosocial behaviour has also started to account for digital environments. Several studies have examined the use of online communities and groups as clinical tools towards psychological recovery and rehabilitation (Hsiung, 2000; Barak and Bloch, 2006; Barak *et al.*, 2008; Leimeister *et al.*, 2009). A handful of studies have examined general help-giving behaviour in online environments with no clinical purpose (Wang and Wang, 2008; Rollman *et al.*, 2000; Lewis *et al.*, 2004; Sun *et al.*, 2006). However, very little research has been conducted on online helping behaviour and gender, despite the fact that gender continues to play an important part in computer-mediated interactions (Christodes *et al.*, 2009).

The only study we could identify directly addressing gender in peer-to-peer online helping behaviour is Wang and Wang (2008). They administered an adapted version of a scale proposed by Ladebo (2004) on Taiwanese online gamers to examine how self-reported helping behaviour is influenced by the sex of the helper and the helpee. The study found no connection between the general likelihood of helping behaviour and player sex. Helping behavior towards same-sex helpees was likewise not affected by the helper's sex. However, helping behaviour towards opposite-sex helpees was influenced by the helper's sex: males were more likely to help females than other male players, while females treated both sexes equally. Other than what could be understood as male courting behaviour, the results thus seem quite gender-neutral.

However, various shortcomings can be pointed out in Wang and Wang's (2008) study. The scale used to measure helping behaviour subsumes a variety of different behaviours. As a result, it may even out gender differences that exist between different types of help. It moreover omits an arguably important aspect of help-giving in today's online hangouts: the materiality of virtual spaces. Previously, the Internet was mainly thought of as a medium: a vehicle for transmitting information, ideas and advice. This limited the range of feasible helping behaviours to types such as advice and emotional support. Many of today's digital hangouts, including but not limited to online games, also have a "material" aspect to them: they allow participants to "own" objects and ask participants to take work-like actions to effect outcomes such as earning more objects (Lehdonvirta, 2009, 2010; Hamari and Lehdonvirta, 2010). The global peer-to-peer market for these virtual goods was worth over three billion US dollars in 2010 (Lehdonvirta and Ernkvist, 2011), but in many cases, virtual goods are exchanged between users as gifts (Lehdonvirta, 2009; Hamari and Lehdonvirta, 2010). It is therefore pertinent to ask not only how advice and emotional support are exchanged online, but also how online helpers distribute virtual wealth and labour to each other.

Another shortcoming in Wang and Wang's (2008) study is that they did not account for the influence of avatar-mediated interaction, which is the vehicle through which most online game players encounter each other. If gender disparities in help-giving were rooted entirely in physiological differences between the sexes, then avatar gender should not influence player behaviour. But what if gender roles also play a part? Studies have shown that the visual appearance of an avatar can influence its controllers' behaviour through behavioural confirmation and self-perception effects. Behavioural confirmation is an effect where people's social expectations lead them to act in ways that cause another person to confirm the expectation (Snyder *et al.*, 1977). Self-perception theory posits that people monitor their own appearance and adjust their behaviour so that it is consistent with the identity cues contained within the appearance, independently of the perceptions of others (Frank and Gilovich, 1988). For example, participants assigned taller avatars behaved more confidently in a negotiation task (Yee and Bailenson, 2007), and participants assigned avatars with a black robe expressed a higher desire to commit anti-social behaviours than participants assigned a white-robed avatar (Peña *et al.*, 2009). It is possible that players using male

avatars find themselves adapting their helping behaviour to fit a male gender role, while players using female avatars act like stereotypical female helpers, regardless of the players' physical sex.

The discussion above can be summarised in the following hypotheses concerning gender and helping behaviour in avatar-mediated interaction. First, opposite-avatar-sex helping behaviour can be expected to be more frequent than same-avatar-sex helping behaviour, as avatars act according to gender roles and engage in courting behavior:

H1. Male avatars are more likely to help female avatars than other male avatars.

H2. Female avatars are more likely to help male avatars than other female avatars.

Second, avatars can be expected to specialise in types of help that are considered appropriate for their gender role:

H3. Male avatars are more likely to provide help in the form of material gifts and labour than female avatars.

H4. Female avatars are more likely to provide help in the form of emotional support than male avatars.

In the following sections, we describe an empirical study to test these hypotheses.

Data and methods

Previous studies of prosocial behaviour in online environments rely on self-reported data. This is problematic in a subject area where social desirability bias can be expected to be significant (Webb *et al.*, 1981). Self-reported data have recently been shown to be especially problematic in the study of gender differences in MMOs: a major study found male and female players to be underreporting their behaviour in a systematically different way (Williams *et al.*, 2009).

This study is the first to use an observational data set to examine prosocial behaviour in an online game. We collaborated with game publisher Tecmo Koei Games to obtain data from *Uncharted Waters Online* (UWO), a Japanese MMO launched in 2005. The game involves participants assuming the role of merchants, explorers and privateers in a seventeenth-century world where sailing is the main means of transport. UWO was chosen for the study because of the availability of data and because it has similarities to other popular MMOs and so-called social games that are currently popular around the world. According to a survey conducted by the publisher ($n = 5,898$), 87 percent of the game's participants are male and 13 percent are female. All age groups are represented, but 44 percent of the participants are in their twenties and 47 percent are in their thirties.

Our data are based on two sources. One source is the avatar database of the game, which contains information on every avatar controlled by the game's participants, such as the avatar's gender. The other data source is a large sample of typed conversations taking place between participants in the game. This sample was gathered by placing 96 characters acting as "listening posts" at random locations inside the game world. These listening posts captured a total of 129,595 lines of conversations.

A content analysis method was used to identify and code instances of helping behaviour in the sample of conversations (Neuendorf, 2002). Helping was defined as "unforced and non-obligated giving of a resource such as material, labour, emotional support or advice", which is not immediately reciprocated or followed with a promise of reciprocation, as such cases must be understood as trade. Help was classified into five types informed by the literature review:

1. material support (virtual items and currencies);
2. labour (performing tasks);
3. emotional support (encouragement, consolation);

4. information (tips and advice); and
5. other (e.g. introducing people, granting access to groups).

Three coders performed the coding according to a detailed coding manual prepared in Japanese.

To address the hypotheses, the coded data were then analysed using cross-tabulation. The avatar database indicates that on the two servers examined in this study, there are a total of 233,302 avatars, of which 130,168 (55.8 percent) are male and 103,134 (44.2 percent) are female. Pearson's χ^2 tests are used to examine the statistical significances of deviations from this expected baseline frequency. A notable limitation in our research design is that we did not have access to the physical sex of the persons behind each individual avatar. Therefore, to distinguish the influence of avatar gender from the influence of physical sex for the purposes of drawing conclusions, we have to rely on reasoning based on the overall gender distributions of the players and avatars. This method is adequate if the observed effects are sufficiently large.

Results

To provide an overall view of the data, the number of helping cases under each category in each variable are presented in Table I. The gender distributions in the table show that helper avatars are slightly more frequently female than should be expected based on the overall gender ratio of the avatars in the game ($\chi^2 = 4.507$; $p = 0.0338$). Helpee avatars' gender distribution does not significantly differ from the avatar population.

To address the first two hypotheses, Table II presents a cross-table analysis of help given by male and female avatars to same-sex and opposite-sex helpees. It shows that male avatars give help to male and female avatars in proportion to their frequency in the overall population, suggesting that they treat same-sex and opposite-sex helpees equally. In contrast, female avatars are significantly more likely to give help to male avatars than to female avatars, indicating that they favour opposite-sex helpees over same-sex helpees ($\chi^2 = 5.792$; $p = 0.0161$). $H1$ is thus rejected, while $H2$ is supported.

Table III presents the same cross-table analysis as Table II, but broken down to five separate analyses based on the type of help in question. It shows that avatar gender does influence the type of help given, but not in the way that was expected. Female avatars give help in a

Table I Distributions of variables used in the study

<i>Variable</i>	<i>Value</i>	<i>Frequency</i>	<i>Proportion (percent)</i>
Helper avatar gender	Male	516	52.4
	Female	468	47.6
Helpee avatar gender	Male	578	58.7
	Female	406	41.3
Type of help	Material	118	12.0
	Labour	188	19.1
	Emotional support	468	47.6
	Information	164	16.7
	Other	46	4.7

Table II Helper avatar gender versus helpee avatar gender

<i>Helpee</i>	<i>Frequency</i>	<i>Helper</i>		
		<i>Male Proportion (per cent)</i>	<i>Frequency</i>	<i>Female Proportion (per cent)</i>
Male	291	56.4	287	61.3
Female	225	43.6	181	38.7

Table III Helper avatar gender versus helpee avatar gender, by type of help

Type of help	Helpee	Frequency	Helper		
			Male Proportion (per cent)	Frequency	Female Proportion (per cent)
Material	Male	35	63.6	44	69.8
	Female	20	36.4	19	30.2
	Total	55	46.6	63	53.4
Labour	Male	45	50.0	55	56.1
	Female	45	50.0	43	43.9
	Total	90	47.9	98	52.1
Emotional support	Male	144	56.0	117	55.5
	Female	113	44.0	94	44.5
	Total	257	54.9	211	45.1
Information	Male	47	56.0	57	71.3
	Female	37	44.0	23	28.8
	Total	84	51.2	80	48.8
Other	Male	20	66.7	14	87.5
	Female	10	33.3	2	12.5
	Total	30	65.2	16	34.8

Note: Percentages in the "Male" and "Female" rows are column-wise, while percentages in the "Total" rows are row-wise

material form more frequently than males ($\chi^2 = 4.041$; $p = 0.0444$). They are also more likely to give this material help to male avatars rather than to female avatars ($\chi^2 = 5.036$; $p = 0.0248$). Female avatars also give help in the form of work or labour more frequently than males ($\chi^2 = 4.791$; $p = 0.0286$). Emotional support, information and other types of help are not given significantly more often by either gender. When females give help in the form of information, they are more likely to give it to males ($\chi^2 = 7.743$; $p = 0.0054$). *H3* and *H4* are thus both rejected.

Conclusions: the queer influence of avatar gender

In this study, we examined the influence of avatar gender on peer-to-peer online helping behaviour, with particular regard to the variety of different types of helping acts possible in today's online environments. The results suggest that avatar gender does matter in helping behaviour, but in a different way from what was expected.

Female avatars were slightly more likely than males to give help to others, and significantly more likely to give help to male avatars than to other female avatars. These findings could be understood through conventional gender role expectations of caring women and cross-gender attraction. The findings concerning gender and type of help, however, are unexpected and puzzling. Female avatars were seen to engage in stereotypically masculine forms of help-giving more often than male avatars. For "feminine" forms of help-giving, no difference between female and male avatars could be observed.

One possible interpretation of these results is that female avatars adopt exaggeratedly masculine behaviours in order to survive in the masculine game environment, similar to some career women's coping strategies in masculine workplaces. In this study it was not women as such who adopted masculine behaviours, but women and especially men appearing in feminine guise: in other words, men in women's clothes felt a need to underline that they are men by adopting exaggeratedly masculine behaviour patterns.

An alternative interpretation is that the female avatars did in fact behave in feminine ways, but that femininity in UWO is understood differently from conventional stereotypes. Earlier literature tends to assume that gender roles are transported in a straightforward manner from physical environments and bodies to virtual environments and avatars, in the same way as virtual landscapes and objects mirror physical ones. However, the visual and conceptual similarity that many game environments have with physical reality is actually quite superficial. A visually similar object may functionally and symbolically stand for something

completely different in a virtual environment. This was the case with, for example, rare virtual horse dung that became a status symbol akin to diamonds among the players of one online game (Lehdonvirta, 2009). Perhaps there is something distinctly “girly” about giving virtual goods as presents in UWO, especially to members of the opposite sex.

As mentioned, we were not able to control for players’ physical sex in this study. Previous research suggests that avatar gender correlates to some extent with player gender (Williams *et al.*, 2009). It is therefore reasonable to ask whether the results really speak of the influence of avatar gender, or simply reflect behavioural differences between physical sexes. Either explanation would be interesting, considering the unconventional results. However, 44.2 percent of the avatars are female, while only 13 percent of the players are female, with many female players probably using a male avatar; in other words, a great majority of the female avatars are necessarily played by men. Physical sex is thus unlikely to be a sufficient explanation for the relatively strong differences that were observed between types of help; in other words, avatar gender most likely influenced behaviour in addition to or instead of physical sex.

This conclusion is in line with earlier studies, where different aspects of avatar appearance were found to influence players through behavioural confirmation and self-perception theory. These mechanisms, which were discussed in the literature review, are also able to explain the influence of avatar gender on player behaviour. Yee and Bailenson (2007) argue that the de-individualising nature of online environments enhances the self-perception effect further, calling it the “Proteus effect”. In line with this naming convention, the influence of avatar gender on player behaviour could be called the “Tiresias effect”, after the mythical Greek man who was temporarily transformed into a woman.

An important implication of this effect for designers of online environments is that avatar design could potentially be used to influence the helpfulness of participants towards each other. When determining what kinds of avatars and other modes of self-presentation are available to participants, the designers also determine the behavioural stereotypes that participants draw from in their daily interactions. This should be noted in especially clinical and educational environments.

While our premise was in the social psychology of helping behaviour, the results can also be connected to broader socio-economic questions of resource allocation in society. Classic economic anthropologist Karl Polanyi posited three allocation mechanisms:

1. price-making markets;
2. reciprocity; and
3. redistribution (Swedberg, 2003).

“Reciprocity” here refers to flows of goods within symmetrical groups, such as families and local communities. Which transactions belong to which sphere is culturally defined. Some transactions are considered “intimate” and therefore outside the scope of markets, while others are “professional” and open to price-making (Zelizer, 2002). In this study, goods outside markets were seen to flow primarily from females to males. This is in stark contrast to mainstream Japanese society, where non-market flows are typically directed from men to women. This suggests that as online economies grow increasingly salient in society, they can lead to interesting adjustments in the delineations of economic relations.

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