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Cross-modal compensation between name and visual aspect in socially active avatars

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ABSTRACT

Avatars serve for humans immersed in virtual settings as the interface between real and virtual worlds. The avatar-creation process involves numerous choices, including choice of visual representation, and choices to imbue the character with personality. Here, we hypothesised that these choices are not independent, and that a cross-modal talk may occur between the different components of the avatar identity. Specifically, we investigated whether name properties may be affected by the visual aspect (human vs. non-human) of the avatar. We analyzed names structure of players characters from the popular massively multiplayer online role-playing game (MMORPG) World of Warcraft, which display both human and non-human avatars. We selected 1261 names of characters actively engaged in the in-game and out-game social networks. Analysis of the names revealed that female names presented more variability than male names, and contained systematically more vowels than male names. However, the strategy used to enrich the vowel composition of female names differed between human-like and non-human characters, suggesting that a lesser proximity with human regular appearance was compensated by an increase of "feminization" of the name. Altogether, our results suggest that a cross-modal compensation occurs between name and visual aspect in the creation of socially active avatars.

1. Introduction

With the augmentation of virtual settings, the situations of immersion of humans in virtual environments are more and more common. To be able to interact with others, individuals have to create avatars, which will serve as the interface between real and virtual worlds. Since avatars are the medium through which interactions in the virtual environment can be experienced, people usually dedicate big attention to their creation (Caplan, Williams, & Yee, 2009; Yee, 2007). The avatar-creation process involves numerous choices, including choice of the visual representation, and choices to imbue the character with personality (Bessière, Seay, & Kiesler, 2007; Lawson, 2000). Among them, the selection of a relevant name, which will allow identification of the avatar and thus carry part of its identity, is a key point. We here hypothesised that these choices are not independent, and that a cross-modal talk may occur between the different components of the avatar identity. Specifically, we investigated whether name properties may be affected by the visual aspect (human vs. non-human) of the avatar.

To answer this question, we used as model the highly popular fantasy-oriented massively multiplayer online role-playing game (MMORPG) World of Warcraft (WoW, Blizzard Entertainment). Massively multiplayer online role-playing games (MMORPGs), one of the most popular and addictive facets of Internet, are games in which players enact characters in a virtual online world (Caplan et al., 2009; Yee, 2006). As these characters, players can explore the virtual world and undertake "adventures" as in any computer game. But in MMORPGs, players have massive social interactions with other characters, either controlled by the program itself (these characters being referred as non-player characters) or directly controlled by other players (Alexander, 2003; Bartle, 2003; Ducheneaut & Moore, 2004).

For our purpose, WoW has a major advantage: each player creates a character belonging to one of two factions, that are presenting very clear-cut visual aspects. One of these two factions – the Alliance – gathers human-like creatures (humans, dwarf, gnome, night elf, and draenei – a humanoid race created specially for the game), while the other faction – the Horde – gathers more exotic, monster-like creatures (orc, troll, tauren (minotaur-like creatures), undead and blood elf).

Thus, WoW represents an interesting model to analyze whether the name attribution process of an avatar can be influenced by the visual aspect of this avatar. Word processing in alphabetical languages strongly relies on the structure of their component

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letters, and specifically on the different cognitive treatment between vowels and consonants, as supported by theoretical (Grainger & Jacobs, 1996; Paap, Newsome, McDonal, & Schavaneveldt, 1982), cognitive (Caramazza, Chialant, Capasso, & Miceli, 2000; Nazzi, 2005; Pelli, Farell, & Moore, 2003), and physiological studies (Carreiras, Duñabeitia, & Molinaro, 2009). We thus chose to analyse the most basics features of names, by quantifying the structure of their vowel/consonant composition.

The analysis of 1261 names of characters actively engaged in the in-game and out-game social networks revealed not only clear male/female differences, but also indicates that cross-modal compensation is occurring between the choice of the name and the visual aspect of the avatar during the avatar-creation process, suggesting that this cross-modal talk may play a critical role in the process of imbuing virtual interfaces such as avatars with personality.

2. Material and methods

2.1. Names collection and selection

Names were collected using the "World of Warcraft Armory" website (www.wowarmory.com), which is a searchable database regarding WoW characters, including their server and their Guild affiliation. Players access the game through servers, called "Realm", each Realm being an individual copy of the virtual world of the game. Realms are categorized by language, with support available in this language (Blizzard Entertainment, Realm Types). Names were obtained from a single North-America English-speaking server. Since in a given Realm, each single name can be given only once, limiting the sampling to a single Realm was a way to insure that no name was duplicated. In WoW, Guilds are autonomous player organizations which allow numerous players to coordinate their actions (Alexander, 2003; Chen, Sun, & Hsieh, 2008). In the Armory website, only characters of level superior to 10 are listed in the Guilds databases. Six Alliance-affiliated Guilds and six Horde-affiliated Guilds were randomly selected from having active members on the forum of the Armory website. By selecting characters belonging to Guilds, with a level above 10, and from Guilds active on the forum, we tried to insure to study names of characters actually playing and actively engaged in social interactions with other characters.

2.2. Names analysis

For each name, the following parameters were noted: the number of letters, the number of vowels, the occurrence of two or more consecutive vowels, the occurrence of three or more consecutive vowels, and the first letter. For the purpose of this study, the following letters were considered as vowels: A, E, I, O, U, and Y. Semi-consonants such as J or W were systematically considered as consonants.

2.3. Statistical analysis

When applicable, results are presented as mean ± SEM. Analysis of the data was performed using non-parametric Mann–Whitney *U* test. The non-parametric distribution free Kolmogorov–Smirnov test was used to compare two cumulative probability distributions to each other. These distributions can be readily used for statistical tests without any assumptions about the nature of the underlying theoretical probability distributions (Press, Flannery, Teukolsky, & Vetterlin, 1988). All comparisons of distributions with the Kolmogorov–Smirnov test were performed at 0.05 level.

3. Results

3.1. Sample characterization

A total of 1261 names were collected from 12 Guilds (6 Alliance for a total of 616 names and six Horde for a total of 645 names). The average number of characters of level 10 and above was 102.67 ± 18.39 members in Alliance Guilds and 107.5 ± 20.69 members in Horde Guilds. The exact repartition of characters according to gender and race within Alliance and Horde Guilds is provided in Table 1.

3.2. Repartition of names

The length of the names was comprised between 2 letters (alliance females and horde males) or 3 letters (alliance males and horde females) and 12 letters (all groups). No significant difference was assessed in the overall repartition of the length of the names, whatever the group (alliance males and alliance females, $p = 0.995$; horde males and horde females, $p = 0.962$; alliance males and horde males, $p = 0.515$; alliance females and horde females, $p = 0.729$; alliance males and horde females, $p = 0443$; and alliance females and horde males, $p = 0.436$).

The overall repartition of names according to the first letter was very similar whatever the group (Fig. 1, alliance males and alliance females, $p = 0.329$; horde males and horde females, $p = 0.423$; alliance males and horde males, $p = 0.450$; alliance males and horde females, $p = 916$; and alliance females and horde males, $p = 0.432$). Due to the higher level of variability, comparison between alliance females and horde females almost reached the significant level ($p = 0.074$). The most used first letters for alliance names were C (9.68%) and S (9.09%) for males and A (11.64%) and S (11.27%) for females. The most noticeable differences were observed for alliance names for the letters M (7.62% for males vs. 2.91% for females), L (1.76% for males vs. 5.09% for females), N (3.81% for males vs. 6.18% for females), and R (4.99% for males vs. 7.27% for females). The most used first letters for horde names were S (10.88%) and D (8.56%) for males and S (11.73%) and M (11.26%) for females. The most noticeable differences were observed for horde names for the letters J (1.62% for male vs. 4.23% for female), L (1.16% for male and 5.63% for female), and W (3.7% for male vs. 0% for female).

Table 1
Repartition of characters within alliance and horde guilds.

Alliance	
Gender	
Male	54.73 ± 2.39%
Female	45.27 ± 2.39%
Race	
Draenei	17.92 ± 1.08%
Dwarf	9.13 ± 1.88%
Gnome	11.74 ± 1.72%
Human	33.92 ± 2.39%
Night elf	27.29 ± 2.05%
Horde	
Gender	
Male	66.49 ± 3.62%
Female	33.51 ± 3.62%
Race	
Blood elf	31.79 ± 3.31%
Orc	16.88 ± 2.73%
Tauren	20.06 ± 2.06%
Troll	11.24 ± 2.07%
Undead	20.03 ± 2.31%