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What characteristics of the gamers'profile should be taken into account in player-centred game design?

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Abstract. In this paper, we introduce the theory of trait Emotional Intelligence ('trait EI') as a personality theory that could assist in exemplifying the gamers' profile and contribute to the design of player-center game experiences. Data from two studies (a game-specific and a game-general one) led to a number of player-centered playability principles that could inform the design of adaptable games and games targeting specific gaming audiences. The gamers' emotional characteristics were found to be of prominent importance to the design of good games.

Keywords. Player-centred design; Emotional Intelligence; nationality; gender

1. Introduction

A user-centered approach is recognized as fundamental when studying usability [1]. In this paper, we depart from traditional conceptions of usability measuring games' functional values, to examine usability in terms of playability and player-centered design. We introduce the theory of trait Emotional Intelligence ('trait EI') as a personality theory that could assist in exemplifying the gamers' profile and contribute to the design of player-center game experiences. Trait EI assesses individuals' self-perceived emotional characteristics and dispositions and as a personality trait was found to relate to well-being and life-satisfaction [2, 3]. Rather than examining the immediate emotional reactions of the gamers (see literature on affective gaming), we consider for their socio-emotional personality characteristics and how these might relate to certain game preferences (e.g., choice of certain games, nature of gameplay, in-game actions) in order to propose gamer-sensitive playability design principles. To this end, we also examined gamers' demographic characteristics specifically gender, age, nationality, and how these might relate to game preferences. The player-centered usability principles proposed in this paper emerged from the empirical examination of gaming in two instances: a) Study 1: A short-scale study examining general game use and b) Study 2: The gamers' use of a specific game - World of Warcraft (WoW). These

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principles contribute evidence to the design of adaptable games and games targeting specific gaming audiences.

2. Playability Guidelines

Traditional usability evaluations (e.g., ISO 9241-11) could only be applied to the case of gaming if games were viewed as regular software products. In the case of game design 'usability is not sufficient to achieve the optimum Player Experience' [4]. Considering that games directly relate to the experience of gaming (by producing feelings of fun and enjoyment) and game interaction, the concept of playability has been introduced to evaluate usability for games. Malone [5] was the first to introduce heuristics for designing enjoyable interfaces drawing from the example of computer games, including challenge (i.e., goal, uncertain outcome), fantasy, and curiosity (i.e., audiovisual effect, randomness, new information when previous knowledge is not adequate). Researchers [6] following Malone modeled the gamers' enjoyment using the dimensions of flow proposing four elements of playability: 1. Functional playability; how control mechanics relate to gameplay (e.g., controllers of video game consoles), 2. Structural playability; evaluation of the rules, structures and patterns of the product as well as the players' evaluation of the skills, experience and actions required for gameplay. 3. Audiovisual playability; the games' audiovisual style and appearance, and 4. Social playability; the games' potential/functionality to develop online communities, communicate social information and form diverse social relationships from antagonistic to romantic ones. Similarly, Sweetser and Wyeth [7] using the dimensions of flow and aspects of social interaction modeled the gamers' enjoyment and managed to distinguish between high and low-rated games. Febretti and Garzotto [8] made a distinction between the terms 'usability' and 'playability' and identified that playability factors such as social interaction, challenge, concentration, immersion, player ability, objectives, feedback, immersion, and control, foster or inhibit long-term game engagement (given that usability problems are few and easily overcome).

Although much emphasis has been given on producing playability principles drawing from theories of play, fun and enjoyment, less emphasis has been given on how the gamers and their actual gaming experience can inform usability and playability assessments. In general, playability heuristics resulted from the analysis of game-related theory and reports from game designers that led to the production of varied sets of game design features required for designing successful game experiences. A different methodological approach proposed by Fabricatore, Nussbaum, and Rosas [1] structured playability criteria based on the players' actual experience of gameplay (through game sessions) and gamers' preferences for play pointing to game aspects such as identity, energy, the player's view, transitions between scenarios, and complexity. Sketching the profile of end-users can contribute to designing more satisfying and personalised game experiences and thus cater gamers' individual characteristics more effectively.

Reviewing recent game demographics, it becomes evident that, alongside the traditional profile of the 'hardcore' gamer, casual gaming has come to the forefront [9]. The latest ESA report [10] points to a gender equality distribution with 56% of gamers being male and 44% female. The most frequent female gamer is on average 43 years old while the male gamer is aged 35. In addition, the top three types of games played are social games, action games and puzzle/board/card games. Moreover, almost half of

the US population (more than 150 million) [10] and 44% of Europeans [11] are gaming. This demographic analysis indicates that gamers are not a homogenous population and motivates a closer examination of the gamers and their game practices to identify whether certain individual characteristics relate to gaming and can explain the above discrepancies. This understanding will contribute to designing more rewarding and satisfying gaming experiences after considering for the players' profile and their individual characteristics.

In an attempt to shed light on who the gamers are and how this knowledge might relate to gaming, we deployed the concept of trait Emotional Experience ('trait EI'). Trait EI refers to individuals' self-perceived emotion-related abilities and behaviour dispositions. It is a construct measuring emotional intelligence and its four components: a) Well-being – Individuals with high scores feel happiness, fulfilment, and well-being, b) Emotionality – Individuals with high scores believe they have a wide range of emotion-related skills that can use to develop and sustain close emotional relationships, c) Sociability – Individuals with high scores believe they can interact and communicate better within diverse social contexts (social influence and interaction in conditions other than family and personal relationships), and d) Self-control – Individuals with high scores believe they can control their urges and desires and regulate stress [3]. Trait EI has been positively associated to, for example, life satisfaction [2] and adaptive coping styles [3] while it is inversely associated to maladaptive styles [3, 2] and depression [12]. Individuals with lower scores on trait EI are more likely to experience 'personality disorders' [2]. The concept of trait EI has been deployed in this study due to its relationship to gamers' preferences for play and persistency of gaming [13, 14]. Game preferences were found to match with the gamers' trait EI indicating that gamers are more likely to choose game practices that accord with their personality characteristics.

3. Methodological Design and Results

To identify which of the gamers' characteristics are useful in player-centred usability design, we draw evidence from two studies: a) A short-scale survey (N=114) with mainly European gamers who play multiple genres of digital games. Specifically, 73.7% of gamers reported playing more than one type of games including action/adventure, strategy, role-playing, and casual/arcade games (e.g., Grand Theft Auto, Fifa, Diablo, Minecraft, Sims, WoW, Angry Birds, Solitaire). In terms of origin, 72.8% of gamers were European and 23% North American. This study was focused on examining gender issues (53.5% male; 45.6% female) (Mean age=30.8, SD=12.3), and b) A large scale survey (N=1042) with mainly male American (N=545, Male: 515) and European (N=497, Male: 487), 16-25 years old, high-end gamers (i.e., gamers who have reached the highest game level) of the game World of Warcraft (WoW). By being systematically involved in gaming, high-end gamers can illuminate the key design principles underlying long-term involvement in gaming and inform the design of games that reinforce persistent use. In both studies, gamers were found to game daily, 3 to 5 hours a day. Participants were self-selective, identified through online announcements of the two studies in popular gaming forums such as gamespot.com and reddit.com. Data for gender, age, ethnicity, trait EI, and game preferences/uses were collected in both studies. In Study 1, game preferences referred to frequently played games,

location, frequency and duration of gaming, and reasons for gaming. In Study 2, game preferences referred to in-game choices as measured by Yee's Motivation of Play scale [16]. Yee categorised game preferences in MMORPGs into three clusters: achievement preferences (competition, advancement, game mechanisms), social (socializing, teamwork, relationships), and immersion preferences (exploration, role-playing, discovery, customization). The short version of the Trait Emotional Intelligence Questionnaire [TEIQue-SF; 15] was used to measure trait EI. The TEIQue-SF includes 30 items on a 7-point Likert scale. Descriptive and inferential statistics were used to analyze data and draw conclusions.

Study 1: Independent t-tests revealed no gender differences in terms of frequency and duration of gaming, location of gaming (home/on-the-go/at work) and trait EI, indicating that game preferences are rather similar between male and female gamers. In terms of the location of gaming, the great majority of participants prefer to game at home (83% of male and 69% of female; 27% of female game either on-the-go or both home and on-the-go). This evidence suggests that designing games specifically for women might not be of use due to similar profiles and patterns of use between male and female gamers. The qualitative, thematic analysis of the reasons for play indicated as the most frequently reported themes the following: a preference for flexible games with constant changes, storyline, multiplayer elements, quick/easy games and promotion of thinking skills.

An independent t-test revealed no gender differences in trait EI ($t=-.89$, $df=111$, $p=.370$, NS). On the contrary, a correlational analysis indicated that gamers with higher trait EI tended to game less hours per week ($r=-.311$, $p<.001$). Also, the older the gamer becomes the less hours on gaming were spent ($r=-.310$, $p<.001$). These patterns confirm previous published work [13] and raise the need for designing short and easily completed games to appeal to older gamers who spend less time on gaming.

Study 2: In terms of nationality, independent t-tests revealed no statistically significant differences in game frequency and duration of gaming between European and American gamers. Statistically significant differences were found in trait EI; American trait EI scores ($t=4.19$. $df= 1040$, $p <0.001$) ($M=4.92$, $SD=.85$) were higher than European ($M= 4.70$, $SD=.79$). In terms of game preferences as measured by Yee's Motivation of Play scale [16], American gamers with greater interest in achievement practices were found to have lower scores on global trait EI ($r = -.149$, $p <.001$), well-being ($r = -.115$, $p<.001$), self-control ($r =-.173$, $p<.001$) and emotionality ($r =-.162$, $p<.001$). No significant correlations for sociability were found ($r = -.006$, $p<.001$. NS). American gamers with greater interest in social practices presented higher scores in global trait EI ($r = .185$, $p<.001$), well-being ($r =.189$, $p<.001$), emotionality ($r =.224$, $p<.001$) and sociability ($r =.142$, $p<.001$). No significant correlations with self-control ($r =.067$, $p<.001$, NS) were found. The analysis of the preferences of European gamers revealed that achievement practices were negatively related to only emotionality ($r =-.130$, $p<.001$) while social practices were positively related to trait EI ($r =.119$, $p<.001$), well-being ($r=.088$, $p<.005$), and emotionality ($r = .158$, $p<.001$). No significant differences were found in immersive practices.

4. Conclusion

Two studies were conducted to identify which characteristics of the gamers' profile inform player-centered usability design. Nationality and emotion-related

personality traits were found to relate to game preferences. Even though recent statistics point to the interest of gamers in social games and collaborative gameplay [10], there is still scepticism as to whether social interaction should be included in usability evaluations [17]. Our study stresses the need to bring to the forefront the social and emotional aspects of usability as a means to design enjoyable player-centered game experiences. This work places under scrutiny the validity of those HCI approaches generalizing usability principles and heuristics to the universe of gamers assuming that they comprise a homogenous population. Our findings strongly support the consideration of specific individual characteristics to the design of player-centred game experiences as follows:

4.1. Gender: The stereotype of the gamer as a male teenager no longer holds true as recent statistics [10] point to a gender equality distribution between adult male and female gamers. This gender distribution was confirmed in Study 1. In contrast, a male-dominant distribution was observed in Study 2 suggesting that game-specific examinations might produce a different understanding of gender issues in gaming and skew results if certain games are over-presented in a given piece of research. In addition, the failure to engage girls in gameplay when testing early game prototypes [23] and the assumption by some game designers that female gamers need special 'themes' to be attracted to gaming [24] led to the belief that 'female-friendly' games should be designed. Study 1 point to common patterns of game use between male and female gamers advocating the design of gender-free games. Specifically, both male and female gamers were found to be involved in various games, play frequently and persistently, both at home and on-the-go, and have similar emotion-related characteristics. Also, they game less frequently as they grow up and prefer easily-implemented, flexible, challenging games that integrate storyline elements and promote thinking skills. Similar patterns of gaming between male and female gamers are found elsewhere [27] including the perception of gaming as being integrated in everyday life and as an escape from reality, and social interaction and enjoyment as reasons for gameplay. What might prevent female gamers from playing specific games and perhaps explain the dearth of female gamers in games such as WoW, might relate to stereotypes in certain games such as epic struggles, violent and competitive content, and the presentation of female game characters as attractive, sexy, innocent or supplementary characters [25].

4.2. Nationality: Significant differences in trait EI and game preferences were found between Americans and Europeans. Gamers' preferences for play were found to be culturally bounded; American gamers were more interested in achievement practices, that is, gaming that involves competition with others and in-game advancement. On the contrary, European gamers were found to be more interested in social practices, including socializing, group work and the creation of emotional bonds. Immersive practices including role-playing, exploration, discovery and escapism are practices of general interest to gamers. These findings suggest that games should adapt to gamers' personality orientation by providing gameplay choices that satisfy both socially and achievement oriented gamers. Recent statistics [10, 11] point to a discrepancy between the percentages of American (50%) and European gamers involved in gaming (44%). These statistics may comprise an indication that the game market supports better the needs of the American gaming population by offering games designed for achievement and competition rather than collaboration and socializing.

4.2 Trait Emotional Intelligence: Trait EI was inversely related to the time spent on gaming indicating that individuals with higher emotional self-perceptions spend less time gaming. This might comprise an indication that greater self-control, emotional and social skills and wellness relate to less gaming. Although this finding might favour approaches perceiving gaming as an outlet to real-life dissatisfactions [see 18], the trait EI mean analysis indicates a relative high mean trait EI score (M=4.8/7, SD=.94), suggesting that this is less likely the case. In terms of trait EI, Americans were found to perceive themselves as having higher trait EI scores compared to Europeans. The within-groups analysis of trait EI scores confirmed previous studies on the role of trait EI in gaming [13], indicating that gamers' emotional characteristics should be considered when designing games. Both American and European gamers with higher scores on trait EI were found to be prone towards social practices. This is an indication that more emotionally satisfied individuals become interested in the social aspects of gaming including, socializing, group work and significant relationships. On the contrary, Americans with lower scores on trait EI were more interested in achievement practices. This was not the case for Europeans; gamers with lower scores on emotionality only, that is, self-perceptions on emotion-related skills and personal relationships, were found to be more interested in achievement practices. It is suggested that for Europeans, achievement practices are of less interest, with the exception of those gamers who perceive themselves as having a narrow range of emotion-related skills and less able to develop and sustain close emotional relationships.

These findings are in contrast to approaches that consider emotional evaluations as unrelated to the process of usability assessment [19, 20]. Following Norman [21, 22], what is indicated in this paper is that good game designs have to consider for the gamers' emotional characteristics. The socio-emotional aspects of human behaviour should not be neglected in usability procedures, since gamers are more likely to become immersed in gameplay when it presents such features that align well with their emotional characteristics and game preferences.

Bartle [26] analysing MMORPGs categorised gamers into: killers (gamers who provoke or impose to others), achievers (competitive gamers), explorers (exploring the game world and game mechanics), and socialisers (being interested in relationships and communication). This taxonomy applies to MMORPG players and virtual worlds only and not to any other type of games or online activities. As explained by Bartle [26] applying the taxonomy to other gamers, there is the risk of dismissing other types of gamers that might exist in different game genres. Yee [16] elaborated further on this work clustering gamers' preferences in MMORPGs into achievement, socializing, and immersion. This paper adds insight to gamers' taxonomies as described by Bartle and Yee. Specifically, Bartle's and Yee's socialisers are described as individuals high in emotional intelligence; they are emotionally and socially aware and look for game experiences where they can express these personality characteristics. Bartle's killers and achievers (Yee's achievers) are described as less emotionally and socially aware individuals who look for less social game experiences such as imposing and competing others. In accordance with Bartle [26], immersive preferences underlie both achievement and social practices and are therefore endorsed by gamers with different emotion-related personality characteristics. In contrast to Bartle's and Yee's genre-bounded categorization (explaining game uses for MMORPGs only), this paper offers a gamer-sensitive categorization drawing from personality theory.

One of the limitations of this work relates to the generalization of results. Findings could be generalised only within the game genres under examination. Specifically,

examining a single game, findings from Study 2 could be generalized to the genre of MMORPGs, in particular multiplayer role-playing games with similar affordances as the game WoW. Also, the average age of the WoW gamer in this study (16-25 years old) differs from the mean age of the average gamer (35 for male and 43 for women) [10] suggesting that the identified relationships might not apply to the general population of gamers (e.g., older gamers) and/or gamers who are playing other types of games (e.g., mobile games). In addition, it could be argued that the highly social interactive environment of games such as WoW [28] might have skewed our results. Yet, other research has showed that despite the social focus of MMORPGs, gamers with diverse game preferences and personality types are found to customize those games to their own individual style of gameplay leading to, for example, the identification of individualised forms of gameplay within social games such as WoW [14]. In terms of Study 1, greater caution should be given in generalizing the results due to the small sample size. Study 1 provides indications of who the 'generic' gamer might be and raises the need for future and more in-depth examinations of how this generic profile might differ or relate to the profile of gamers who are dedicated to specific games.

Overall, the two samples of gamers under examination are rather distinct. With reference to Study 2, it could be argued that gamers are rather dedicated to a single game as evidenced by the large amount of time they spent on WoW and their long-term and persistent involvement with the game. With reference to Study 1, although gamers are found to spend similar amount of time on gaming as WoW gamers, they spend their time on a diverse set of games. This might comprise an indication that the design of the game (WoW) presents such characteristics and affordances that successfully engage different types of gamers (in terms of personality characteristics) and keep them immersed in gameplay for long. If we analyse the design of the game, it becomes evident that the game encompasses characteristics from diverse game genres such as battlegrounds and arenas (see action and shooter games), role-playing and exploration (see role-playing and sandbox games), mission-based gaming (see strategy games), and management and life simulation (see simulation games). This might explain why gamers with diverse emotional personality traits find themselves immersed in a single game; they can identify and engage with those game options that align well with their emotional characteristics.

In the literature, we often encounter a distinction between 'hardcore' or 'serious' gamers and 'casual' gamers. Hardcore gamers often refer to those gamers who are systematically involved in gaming activities, they often own specialised game equipment (consoles, laptops) and perceive themselves as being 'serious' gamers in contrast to other people who might play games casually on devices such as smart phones and tablets. The emotion-based categorization of gamers given in this paper and the identification that the gamers' emotional traits do matter and should be accounted when designing games were the outcomes of examining both 'hardcore' and 'casual' gamers. These findings suggest that, when it comes to game design, it is pivotal to account for the experience of gaming *per se* and how this is perceived by the gamers (is it enjoyable/fun/satisfying/boring/frustrating?). What hardcore and casual gamers share is that they are both enticed by gameplay and enjoy becoming immersed in it yet in different manners. Emotions are tightly related to gaming and as such they should not be left behind when designing entertaining or other games.

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