Pleasure and enjoyment in digital games

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Abstract. Digital games are played for the experiences they offer. Usually the quality of this experience is considered positive and fun. Here we analyze the difference between two different empirically derived fun measures. The study is theoretically grounded on the key concepts of flow and cognitive theories of emotion. Structural equation modeling was used to test these theories in an empirical dataset (n=2182). The results deepen previous findings of how cognitive evaluation affects emotional outcomes. Pleasurable gaming experience is received when one feels competent, whereas enjoyment requires also arousing challenges. A need to understand psychological processes in order to create desired gaming experiences is discussed.

Keywords: emotion, cognition, digital games, user experience in games.

1 Introduction

Fun is considered key motivation to play digital games. Several factors (e.g., challenge, sociality) are assumed to contribute fun gaming experience [11]. However, the number of fun dimensions and their components is not well understood [7]. In psychology, fun, enjoyment, and pleasure are all seen as agreeable affective reactions. However, there are studies, which make distinction between pleasure and enjoyment, stating that simplistic hedonic models are not enough to account for all behaviors [5]. For example, a rock climber may have unpleasant, yet exhilarating and highly motivating experiences while climbing. There is also empirical evidence that pleasure (hedonic valence) and enjoyment can be distinguish in a digital gaming context [16]. Whether an experience is pleasurable or enjoyable requires analysis of the person-situation relationship more deeply (e.g., abilities and evaluations) [5]. In such analysis the close relationship between cognition and affect must be included.

Cognitive theories of emotions [6,10] suggest that cognitive interpretations and appraisals of events in the world are essential parts of emotions. There are various appraisal features and components, such as the effort anticipated in a situation, perceived obstacles, and the sense of control, all of which shape the emotions attached to these events [6]. In addition, these theories suggest that cognition and emotion form combinations, which in turn affect oncoming evaluations and
emotions [9]. The theory of flow [5] shares the core idea of these theories. In flow, the cognitive evaluation is made between evaluated challenges of the situation and the skills one possess. A different ratio between these two is likely to lead to various emotional outcomes. Also cognitive-affective combinations (e.g., challenge-arousal) leading to positive flow-experiences have been empirically found among the Internet users [12].

In this study we disclose a specific cognitive-affective process underneath distinct pleasure and enjoyment dimensions. The results show how cognitive evaluations of competence (skill) and challenge are combined with emotions (arousal and control) to form super-ordinate concepts, which in turn shape both pleasure and enjoyment. These findings are in line with cognitive theories of emotion [9]. Disclosing the complex cognitive-affective process deepens the findings such as the assumption that challenge leads to fun in games.

2 Methods

2.1 Origin and collection of the dataset

The data have been collected from both laboratory experiments and an Internet survey using the EVE-Experience Questionnaire (EVEQ-GP) [15,17]. In the field of behavioral sciences the use of questionnaires has proven to be a valid way of assessing various mental phenomena [2,4,8,13]. Both the paper and pencil and the online versions of the EVEQ-GP were composed of 180 items (1-7 Likert-scale and semantic differentials) measuring different experiential aspects obtained from being and performing in the game world. The instructions for completing the EVEQ-GP encourage participants to reflect on their subjective gaming experience of one particular gaming session; moreover, the instructions emphasized that the questionnaire was to be completed immediately after a gaming session. Thus, the gaming experience was operationalized as a situated experience stemming from one particular game. The method enables the player to report, within pre-set multidimensional boundaries, how it felt to interact with a digital game. Also included were 27 background questions. In the present study different laboratory experiments and an Internet survey were included in large dataset.

2.2 Description of the dataset

The data consist of 2182 subjects (1972 males, 210 females), who filled in the questionnaire. The mean age of the respondents was 21.5 years (SD=6.0). The average time of playing was 127 minutes (SD=111) and the average size of the display used was 19.2” (SD=4.4). 33% of the respondents played daily, 29.6% played at least every other day, and 24.5% played often but not as often as every other day.

Most of the games played (31.5%) before the questionnaire was filled in were first-person shooters (FPS) either online (15.0%) or offline (16.5%). The second most popular genre (15.0%) was massive multiplayer online role-playing games
(MMORPG), and the third (13.1%) was single role-playing games (RPG) (13.1%). The most popular single game played was World of Warcraft (n=265), which is a MMORPG. Altogether the data included approximately 320 different games, giving a broad scope to the psychology of digital games. Since Pelit magazine focuses on PC games, 85.2% of the games were played with a PC and 14.8% with a console.

2.3 The scales used

In this study, six measurement scales composed of 42 questionnaire items were used. More information concerning the scale composition is provided by our previous studies [14,16]. Challenge scale (5 items, Cronbach’s α=.69) is composed of items measuring how challenging and demanding the game felt. Competence scale is a combination of items measuring user skills and positive feeling of effectiveness (11 items, α=.87). Control (5 items, α=.71) measures the feeling of being in control and independent, whereas arousal (5 items, α=.71) being active and stimulated instead of passive and unaroused. Hedonic valence is the bipolar pleasure /displeasure scale (10 items, α=.86) that is mainly composed of semantic differentials (e.g., happy/sad). Also items measuring boredom and anxiety were negatively associated to valence, emphasizing the bipolarity of the scale. Enjoyment scale (7 items, α=.83) includes aspects of pleasantness and agreeableness. Playing was also evaluated exciting and somehow special (e.g., “I will recommend it to my friends” and “I had peak experiences while playing”). A model was constructed to study the relationships between the cognitive-affective scales and disclose the difference between valence and enjoyment in gaming context. Structural equation modeling (SEM) was used to test the model with AMOS 7 software. SEM offers an assessment of the fit between a model and observed data.

3 Results

We included two latent cognitive-affective constructs for competence-control and challenge-arousal into the model. Since cognitive theories of emotion [9] suggest that new emotions arise from such appraisal combinations, we studied how the two latent cognitive-affective constructs were related to valence and enjoyment. The model fit was tested with a Maximum likelihood estimation method. Overall goodness-of-fit of the model was reasonable with root-mean-error of approximation (RMSEA) equal to 0.052. RMSEA values about or below 0.05 indicate a close fit of the model in relation to degrees of freedom, and values below 0.08 indicate a reasonable fit [3]. Also comparative fit index (CFI=0.959), goodness of fit index (GFI=0.993), and adjusted goodness of fit index (AGFI=0.978) were above the suggested minimum value of 0.9 [1], indicating a good model fit. Although, the chi-square test was significant (χ²(7)= 47.77, p<0.000) it is known that this tests gets exceedingly imprecise with larger samples [3]. All standardized path coefficients were significant. Estimated correlation between latent competence and challenge structures was significant at ρ<0.05, all the others were significant at ρ<0.001 (see Figure 1.).
4 Discussion

Digital games are played for the experiences they offer. Typically the quality of this experience is considered positive and fun. This study shows the difference between two empirically derived measures of fun, that is, pleasure and enjoyment [16]. Structural equation model based on cognitive theories of emotion [6,10] and theory of flow [5] was conducted. The results indicated that being competent and in control in the game leads to pleasurable experience. It was also shown that in addition to being competent and in control, enjoyable gaming experience requires challenges and elevated arousal. This combination makes enjoyment more intensive and stronger emotion as compared to pleasure. Enjoyment being more complex emotion compared to pleasure is also suggest by Csikzentmihalyi [5]. Our results also support previous theorizations and empirical findings that cognitive activities can be combined with emotions to form latent constructs [9,12].

In its current form the model shows how game mechanics are cognitively evaluated and emotionally experienced. In future studies a motivational component should be included in the model in order to understand more about the measured emotions [9]. Also other relationships besides linear should be considered to understand, for example, “bad challenges”. Considering player psychology in more depth in the game design phase will lead to more controlled and desired gaming experiences.

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### References