Are Digital Games Perceived as Fun or Danger?
Supporting and Suppressing Different Game-Related Concepts

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Abstract

Violent digital game play has repeatedly been discussed to be strongly related to aggression and emotional instability. Thus, digital game players have to defend against these prejudices through emphasizing positive game-related concepts such as achievement, social interaction, and immersion. We experimentally investigated which positive- and negative-concept players and nonplayers activate when being primed with digital games. Participants were either exposed to violent or nonviolent game content and were required to work on a lexical decision task. Results showed that response latencies for the concept aggression and emotional instability were faster than for neutral concepts (not associated with digital games), but slower than for the positive concepts sociality and competition. Both players and nonplayers felt the need to defend against prejudices and emphasized positive concepts. Neither their own gaming experience nor the game content influenced the results. Being a part of the net generation is sufficient to suppress negative game-related concepts and to support positive game-related concepts to protect digital games as common leisure activity among peers.

Introduction

When thinking about digital games, different associations come into mind. First of all, there are the intense public and science debates that mostly focus on negative effects, especially of games with violent content on aggression and emotional instability. Emotional instability refers to the ineffectiveness to cope with stress, and it is related to neuroticism. Secondly, the popularity of digital games among kids, teenagers, and young adults has been increasing continuously over the past years. Taken together, there might be possible negative effects of digital games, but there must be positive outcomes for players, which motivate them to play. At this point, the following question arises: which negative and positive concepts do young people really associate digital games with?

Research on the effects of digital games mainly focuses on the effects of violent ones on negative real behavior such as aggression and, currently, on psychological health. In response to this research and the ongoing public debates, players’ communities argue that the motivation to play does not stem from aggression, emotional instability, or any antisocial behavior, but is related to positive aspects such as all leisure activities. Recent theories in the field of digital game play motivation confirm the connection to positive aspects, independent of game content.

The argumentation against negative effects of digital games on real behavior is not only supported by hardcore players but also by their peers and by other members of the net-generation, who do not play digital games at all. In our previous research, we found that nonplayers as well as players suppressed aggressive concepts when being primed with First-person shooters (FPS). In the case nonplayers and players were actively introduced to suppressing aggressive associations with FPS, these defense strategies were no longer necessary. We argue that nowadays, adolescents grow up with digital games as a common tool that is used for spending leisure time. Besides suppressing any negative effects, players might enhance the value of positive outcomes to protect their gaming habits. The question arises whether nonplayers accompany their playing peers not only by suppressing negative effects of digital games but also by associating positive effects. What role does gaming experience play concerning the activation of positive concepts associated with digital games when being confronted with different game content?

Our study’s aim was to investigate the activation of specific game-related concepts in players and nonplayers when being confronted with violent/nonviolent digital game content. The first goal was to replicate the finding that young adults suppress aggression-related concepts when being confronted...
with violent digital games independent of own playing experience and to investigate whether emotional stability, as a further negative concept, is also suppressed. In addition, we analyzed if players and nonplayers differ regarding the activation of game-related positive concepts. To assess the implicit activation of digital game-related concepts, we used priming and a lexical decision task.

Theoretical Background

Knowledge structures are described as semantic concepts and corresponding associations between different concepts. The simultaneous processing of two concepts results in associations between these concepts, which are interpreted as cognitive links. Priming the concept, digital games, for instance, via pictures of digital games, results in spreading activation via cognitive links to associated concepts.

Concepts and cognitive links between them can differ regarding individual knowledge and experience and can also develop through reports of third parties, such as media reports. Particularly, the possible effects of digital games on real behavior and mental health are frequently mentioned in media reports. If players try to defend digital games, they need to deny effects on real aggressive behavior and on emotional stability.

However, how do defensive strategies work? One way to defend the self is to suppress activated negative associations that require cognitive capacity and, additionally, enough personal motivation. However, personal affection might not only depend on personal gaming experience but also on (the degree of) belonging to the net-generation.

Young adults—if not playing digital games themselves—almost all have friends who play as a leisure activity. They identify themselves with a computer-using generation and grow up amidst prejudice against this medium. Kneer et al. found that not only players but also nonplayers apply defensive reactions. Using a lexical decision task, it was shown that young adults suppressed aggressive concepts irrespective of own playing habits when being primed with First-person shooter content. There were no differences for the no-priming control group concerning response latencies of aggressive and neutral words. The found effect for non-players is not due to blocking negative content when being primed with FPS, but due to activated defense strategies. If young people really try to protect violent digital games, how do they suppress negative associations?

One way to neglect negative thoughts is to intentionally focus on distractors and activate related positive concepts. If enough cognitive resources were available, the activation of negative concepts can be stopped, and positive concepts can be heightened. In this case, affected persons should decrease negative and increase positive associations with digital games. Recent research has provided support for this assumption. Using a lexical decision task, Bösche found that playing a violent digital game activated negative and positive game-related concepts, independently of the participants’ violent digital game play experience. What still remains unclear is which positive concepts are activated and if this activation helps suppress negative associations.

As research suggests, digital game enjoyment is mainly due to the general aspects of this medium. For instance, Sherry, Lucas, Greenberg, and Lachlan argue that persons who regularly play digital games associate positive concepts such as relaxation and achievement rather than aggression.

A well-known player motivational taxonomy is Yee’s model, which suggests, based on Bartle’s player typology, three main motivational reasons for digital game play in terms of massively multiplayer online (role-playing) games: achievement, social interaction, and immersion. Achievement is described as the motivation to compete with other players, and it includes advancement, mechanics, and competition. Social interaction is concerned with socializing with others, for instance, communication and helping, teamwork, and being part of a social group. The third motivational dimension immersion is described as a cultivation of game characters, and includes escapism, thus relaxing by escaping from the real-world and avoiding real-world problems.

Yee’s main dimensions are confirmed by studies on further game genres, and thus are general enough for different game genres and specific enough to count for this interactive medium. If social interaction, achievement, and immersion are the main reasons for people to play digital games, activating and heightening them might help players to defend digital games against prejudice.

We designed our study to answer these following questions: (1) Do players and nonplayers activate positive game-related concepts and suppress negative ones to defend digital games? (2) Do players and nonplayers differ in the activation of positive related concepts? (3) Does only violent game content lead to defensive strategies or does digital game content in general heighten positive game-related concepts?

We used screenshots of violent and nonviolent digital games instead of confronting participants with playing a game to avoid frustration due to excessive demands concerning gaming skills for inexperienced persons. Response latencies were used as an implicit measure to investigate participants’ concept activation. Participants were required to respond to negative (aggression and emotional instability), positive (social interaction, achievement, and immersion), neutral, and nonwords in a lexical decision task.

We investigated the following hypotheses: (1) As thought, suppression needs cognitive effort, which would mean that participants should respond slower to words of aggression and emotional instability in comparison to their response regarding words of the categories social interaction, achievement, and immersion. (2) Due to protection of the own net-generation, playing experience should not influence participants’ responses to negative or positive words. (3) Assuming that not only violent games but also digital games in general are protected by the net-generation, game genre content should not lead to differences in participants’ responses to positive and negative concepts.

Method

Participants and design

We recruited 64 male participants at the University of Cologne. Half of the participants had playing experience (over the last 6 months, at least 2 hours per week) while the other half had no playing experience with digital games at all. The mean age of players was 23.28, SD = 5.12 years, and of nonplayers M = 21.66, SD = 4.44 years. Players played 14.86 hours per week, SD = 10.53 on average.
A 2×2×6 mixed design was chosen, combining playing experience (player vs. nonplayer) with two experimental conditions (priming of violent vs. nonviolent digital game content) as between-subject factors and word type (social interaction, achievement, immersion, emotional instability, aggression, and neutral words) as a within-subject factor.

Assessments and Measures

Material

The priming material consisted of 30 screenshots from different nonviolent games (see Fig. 1). We pretested the screenshots using a 9-point-SAM (Self-Assessment-Manikin) scale to assess ratings for pleasantness and arousal. The mean age of the 158 participants was $M=25.68; SD=5.69$. The 10 screenshots with the highest ratings concerning pleasantness and the lowest ratings concerning arousal were chosen as primes for nonviolent game content. In addition, the 10 screenshots with violent content were taken from the Kneer et al. study for priming violent game content (see Fig. 1). These 10 screenshots have been pretested in the same way.

To reassure the motivational concepts of Yee, 10 experienced digital game players were asked to write down their personal reasons for digital game play. We categorized these protocols and counted for motivational reasons. As expected, most named categories were related to Yee’s three main concepts: social interaction (20), achievement (16), and immersion (11). For each dimension, we chose 30 related adjectives and added 30 more adjectives related to the category emotional instability. Seventy-six undergraduates (mean age 25.29, $SD=5.18$) evaluated the resulting 120 adjectives. Participants had to judge the fit of each adjective concerning the related category on a 7-point Likert Scale ($1=does not fit at all; 7=fits perfectly$). For each of the four dimensions, 10 adjectives were chosen (lowest fit was 5.37, highest 6.76). Items for aggression and neutral words were taken from Glock and Kneer. All words were pretested for response latencies in previous (unpublished) studies. For each word category, 15 participants conducted a lexical decision task with 10 words concerning the specific category and 10 nonwords. Combined analyses showed no differences between the six remaining word categories, $F(5, 84)=1.28$, n.s.

Results

We computed six mean latencies for each participant regarding the categories social interaction, achievement, immersion, emotional instability, aggression, and neutral words. Before computation of mean latencies, data were checked for extreme outliers: responses were excluded if they deviated from the mean by more than three standard deviations. Furthermore, we checked data for extremely high error rates. Participants’ performance on the lexical decision task was over 95 percent accurate. Due to different word lengths, response latencies were divided by the number of characters of each concerning adjective. We analyzed the response latencies in milliseconds per character using a 2 (playing experience: players vs. nonplayers) × 2 (experimental condition: priming of violent vs. nonviolent digital game content) × 6 (word type: social interaction, achievement, immersion, emotional instability, aggression, and neutral) mixed analysis of variance, with repeated measures on the last factor. As predicted, the main effect for word type reached significance, $F(2, 120)=64.42, p<0.001, \eta^2_p=0.52$ (see Fig. 2 for all means and Table 1 for all single comparisons).

Neither the main effect for playing experience nor the one for the experimental condition reached significance, all $Fs<1$. Furthermore, we did not find any interaction effects at all, all $Fs<1$.

Results indicate that positive and negative categories are activated via priming. Response latencies for the categories
social interaction, achievement, immersion, emotional instability, and aggression were all faster than for neutral words. Response latencies for the negative-concept aggression and emotional instability increased significantly compared to response latencies of the positive-concept social interaction and achievement. The only positive category that did not significantly differ from the negative ones was immersion. Immersion also differed significantly from social interaction and achievement. Figure 2 demonstrates this trend.

**Discussion**

We assumed that belonging to the net-generation\textsuperscript{14} means, besides playing themselves or at least knowing friends who play, to grow up with prejudice against this leisure activity. Being steadily confronted with this accusation should cause the need for defensive strategies to protect not only a typical generation habit but also peers and in-group membership. The applied defensive strategies should result in the implicit suppression of negative associations with these games and in an increase of the activation of positive game-related concepts. As Yee\textsuperscript{13} suggests social interaction, achievement, and immersion to be the main motivational reasons for playing digital games, the activation of these concepts should help suppress the negative-associated concepts. Our results support these hypotheses. Response latencies for social interaction, achievement and achievement were faster than the response latencies for aggression and emotional instability. Words of the concept aggression and emotional instability caused decreased response latencies in comparison to neutral words.

Besides suppression of negative and deeper activation of the positive game-related concepts, our data suggest that social interaction seems to be even more activated than achievement. Words related to social interaction led to faster response latencies than achievement-related words. Achievement might lead to the assumption that someone might become too overambitious if the success concerning the played game becomes too important. In contrast, especially social interaction seems to function as a positively related concept and supports defensive strategies particularly. However, our study design is limited, and the found trend cannot be fully explained. Future research should focus on the importance of the motivational reasons and clarify whether social interaction is the dimension with the most positive meaning.

Not only players but also nonplayers apply defensive reactions when being primed with digital games. This result replicates our previous findings\textsuperscript{15} that response latencies for aggressive words increase when being primed with (violent) game content. In addition, our results show that these defensive processes are also independent of the primed game content concerning violence. This might be due to the prejudice against digital games beyond aggression and can also explain our results for immersion.

We first interpreted the dimension immersion as a positive aspect of gaming, and therefore expected faster response latencies to heighten the activation of positive relations. In contrast to this assumption, the activation of immersion significantly differed from the activation of social interaction and achievement what is in line with the findings of Klimmt, Schmid, and Ortmann.\textsuperscript{12} Immersion cannot only be judged as positive but also be judged as negative. Besides relaxation, immersion includes escapism and escaping from the real world and real-world problems.\textsuperscript{13,38} Escapism could be interpreted as false coping from real-world problems and might outshine relaxation as a positive aspect of immersion. If these negative motivational aspects become dominant, a new threat comes into attention: digital game addiction.\textsuperscript{39–41}

Addiction, particularly in terms of online gaming, is currently discussed as a further possible negative effect of digital games.\textsuperscript{31,39,41} If immersion as a motivational reason to play is interpreted not only as a relaxation option but also as a (false)

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**Table 1. Simple Comparisons Between Different Game-Related Concepts Concerning Response Latencies**

<table>
<thead>
<tr>
<th>Concept</th>
<th>Social interaction</th>
<th>Achievement</th>
<th>Immersion</th>
<th>Emotional instability</th>
<th>Aggression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievement</td>
<td>( t(63) = 7.14 )</td>
<td>( t(63) = 5.02 )</td>
<td>( t(63) = 1.65 )</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Immersion</td>
<td>( t(63) = 12.32 )</td>
<td>( t(63) = 7.96 )</td>
<td>( t(63) = 2.83 )</td>
<td>( t(63) = 5.74 )</td>
<td>( t(63) = 5.74 )</td>
</tr>
<tr>
<td>Emotional instability</td>
<td>( t(63) = 12.10 )</td>
<td>( t(63) = 9.20 )</td>
<td>( t(63) = 4.76 )</td>
<td>( t(63) = 0.59 )</td>
<td>( t(63) = 0.35 )</td>
</tr>
<tr>
<td>Aggression</td>
<td>( t(63) = 11.9 )</td>
<td>( t(63) = 3.38 )</td>
<td>( t(63) = 1.23 )</td>
<td>( t(63) = 3.27 )</td>
<td>( t(63) = 0.41 )</td>
</tr>
<tr>
<td>Neutral</td>
<td>( t(63) = 15.73 )</td>
<td>( t(63) = 9.20 )</td>
<td>( t(63) = 4.76 )</td>
<td>( t(63) = 2.83 )</td>
<td>( t(63) = 5.74 )</td>
</tr>
</tbody>
</table>

\( a p < 0.001. \)

\( b p < 0.01. \)
coping strategy,\textsuperscript{12} and as a possible moderator of addiction,\textsuperscript{38} it has to be considered ambivalently. Thus, immersion can be connected to both positive and negative aspects of digital games. Our findings suggest that players as well as nonplayers suppress associations between immersion and digital games, but we cannot answer the question why. Further studies should focus on the perception of immersion as game play motivation and if this concept is valued positive and negative.

Further limitations need to be mentioned. The used screenshots are not comparable to media reports about digital games. We did not choose newspaper articles or media reports, because we wanted to further analyze violent and nonviolent game associations without automatically priming them by negative or positive media reports. Future research should investigate whether the same concepts are activated by media reports.

As this study tested implicit cognitive associations and their suppression as a function of digital game content, we did not ask participants whether they defended themselves or their playing friends when confronted with prejudice against players. Other studies show that younger nonplayers compared to older nonplayers (age 40+) tend to explicitly defend FPS games, respectively, FPS-playing peers.\textsuperscript{42} In addition, we relied on the motivational reasons suggested by Yee.\textsuperscript{13} There might be other motivational reasons and game-related concepts that we did not consider in the study. Future research also should include explicit measures to assess the feelings toward and the commitment to the net-generation.

The goal of our study was to extend our macrolevel perspective on the influence of the ongoing debates about effects of digital games on younger adults. We cannot explain connections between game play and cognition. The used screenshots are not comparable to real game play, but they were chosen to prevent effects due to nonplayers’ frustration. Future studies should focus on the influence of frustration on the activation of negative and positive game-related concepts and on behavior. We suggest that future research should try to combine micro- and macroanalyses of game effects and therefore compare priming game content and real game play.

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References


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