Induced Attitude Change on Online Gaming among Adolescents: An Application of the Less-Leads-to-More Effect

WEN-BIN CHIOU, Ph.D.

ABSTRACT

The negative impact of Internet use on adolescents has received much popular attention and has also become a popular research topic. How to induce adolescent players to change their attitudes toward online gaming is one of the most important issues in online gaming addiction. The present study is based on the less-leads-to-more effect of dissonance theory. Experimental research was conducted to examine the effects of rewards and decision freedom on attitude change toward online gaming among adolescents considered at risk for addiction. The results supported predictions based on external justification in dissonance theory. Specifically, fewer rewards produced greater attitude change toward online gaming in the condition of personal freedom of choice after participants exhibited attitude-discrepant behavior. However, the less-leads-to-more effect was not prominent in the condition without personal freedom of choice. Adopting a reward strategy to induce game players to disengage online gaming is discussed.

INTRODUCTION

The Internet is pervasive in our lives, but some of its effects are less than desirable. In particular, previous studies have highlighted the problem of Internet addiction. Adolescent students have been identified as having the highest risk of developing Internet addiction, and because online gaming is now hugely popular, addiction to online gaming among adolescents has also received much attention. Previous studies of online gaming addiction have mainly addressed addicts’ psychological motives and profiles of gamers. In contrast, research focused on changing adolescent players’ attitudes toward online gaming has been rare. Online game players’ attitudes may play a critical role in determining the motives and meanings of their involvement and addictive behaviors. Therefore, when considering interventions for adolescents’ pathological use of online games, it is crucial to determine how adolescent players with addictive inclinations can be motivated to change their attitudes toward online gaming.

Attitude change based on external justification in dissonance theory

Cognitive dissonance theory hypothesizes the existence of a need state, cognitive dissonance, as a source of motivation. Cognitive dissonance refers to a state in which contradictory relationships between...
cognitions and perceptions exist simultaneously in a person. If an individual has two cognitions that are dissonant, the individual will either change one of the cognitions or ignore the conflict because dissonance reduction is rewarding. Cognitive dissonance theory further suggests that external justification plays a key role in influencing the experience of cognitive dissonance. In principle, people who have sufficient reason for external justification feel little or no dissonance in attitude-discrepant behavior. Chiu and Wan demonstrated that personal responsibility and justification of cost are crucial factors impacting adolescent players’ attitude changes toward online gaming and their willingness to engage in attitude-discrepant behavior. The present study aimed to examine whether reward and freedom of choice would interact to affect game players’ attitude changes.

Reward and the less-leads-to-more effect

According to cognitive dissonance theory, dissonance often occurs in situations involving induced compliance. Thus, dissonance will be stronger when there are fewer reasons for engaging in attitude-discrepant behavior. A classic experiment suggests that it may be easier to change individuals’ attitudes by offering them just enough inducement to produce attitude-discrepant behavior. Sufficient reward beyond this level will reduce dissonance and subsequent attitude change. Social psychologists sometimes refer to this surprising prediction as the less-leads-to-more effect—less reason or smaller rewards lead to more attitude change—and this effect has been confirmed in many studies. The less-leads-to-more effect is an important consideration in determining how to change game players’ positive attitudes toward online gaming. It was predicted that greater attitude change will occur under the condition of reduced reward.

The interplay of decision freedom and reward

Attitude-discrepant behavior creates dissonance only when the behavior is freely chosen (or, at least, when the person feels it is freely chosen) because individuals may be able to justify their attitude-discrepant behavior when they lack freedom of choice. The effect of freedom of choice on dissonance and subsequent attitude change was shown quite clearly in a classic study conducted by Linder, Cooper, and Jones. Their findings suggest that the perception of choice about one’s behavior is a critical precondition for attitude changes produced by one’s experienced dissonance. Moreover, the less-leads-to-more effect is prominent when attitude-discrepant behavior occurs with freedom of choice. Following this rationale, it was predicted that the less-leads-to-more effect would be more pronounced under the voluntary condition.

METHODS

Participants and design

The initial sample included 158 adolescent students with online gaming experience, as determined by purposive sampling. The Online Games Addiction Scale for Adolescents in Taiwan (OAST), developed by Wan and Chiou, was used to screen those adolescents with an inclination toward online gaming addiction. The OAST employed a 4-point scale on 29 items (scores ranging from 29 to 116) and the Cronbach’s alpha for the entire scale was 0.91. Confirmatory factor analysis and a contrasted-group method revealed that the OAST was a valid measure. The formal sample consisted of 108 adolescent students (approximately 16 to 23 years old; 71 males and 37 females) whose scores on the OAST (M = 80.44, SD = 12.16) were higher than the midpoint of its range (i.e., 73), t(107) = 6.36, p < 0.001. Participants were randomly assigned to a 2 x 3 (reward: high vs. medium vs. low) between-subjects design.

Procedure

In a pretest, participants were asked to rate their initial attitude toward online gaming. This pretest was used to compute their attitude changes after receiving the assigned manipulation. The experimental phase was conducted in small sessions of six participants per session, determined by the block-random method. The study was couched as a debate on online gaming addiction among adolescents. To increase involvement in the task, participants were told that the National Science Council (NSC) in Taiwan was sponsoring the study and that the Science Education Department of the NSC would take their arguments into consideration when making policies dealing with the problem of adolescents’ online gaming addiction.

Following the freedom of choice manipulation, the researcher explained to the participants that online gaming addiction has become an issue worthy of everyone’s attention and that each participant would be required, as part of the study, to write an essay on the subject. Participants were assigned to one of two conditions: freedom of choice or no freedom of choice. Later, they were asked to consider arguments for a
Participants were asked to rate their attitudes toward online gaming on both the pretest and posttest. In the formal data, the mean scores across the pretest were submitted to ANOVA. Participants’ attitude change scores (M = −1.00, SD = 0.93) were calculated using the attitude scores on the posttest (M = 3.76, SD = 1.06) and compared to the scores on the pretest (M = 4.76, SD = 0.76). Negative attitude change scores indicate that the participants’ subsequent attitudes toward online gaming shifted to the negative side.

RESULTS

Manipulation check

Participants’ responses to the measures are shown in Table 1. First, participants’ responses on online gaming addiction and their initial attitudes toward online gaming were submitted to ANOVA. Both their scores of the OAST (F[5, 102] = 0.47, p > 0.05) and initial attitudes toward gaming (F[5, 102] = 1.22, p > 0.05) were not significantly different across the six experimental conditions. These findings indicated that the random assignment of this experiment was satisfactory to produce six equivalent groups.

Regarding the freedom of choice manipulation, the participants in the condition with freedom of choice (M = 6.89, SD = 1.22) felt more free in writing the essays than those in the condition without freedom of choice (M = 2.78, SD = 1.24), t(106) = 17.35, p < 0.001. As to the amount of reward manipulation, a linear trend analysis indicated that participants felt the reward was highest in the high-reward condition (M = 7.39, SD = 0.90) and lowest in the low-reward condition (M = 2.56, SD = 0.94), with the medium-reward condition in between (M = 5.14, SD = 0.96), F(1, 105) = 481.23, p < .001.

Effects of reward and freedom of choice on attitude change

Descriptive statistics of participants’ attitude changes are shown in Table 2. These responses were submitted to a 2 × 3 (freedom of choice: with vs. without × amount of reward: high vs. medium vs. low) between-subjects ANOVA. As Levene’s test for homogeneity of variances was not significant (F[5, 102] = 1.04, p > 0.05), equal variance was assumed for subsequent analyses.

ANOVA revealed that reward significantly affected negative attitude change, F(2, 102) = 27.44, p < 0.001. The participants’ attitude changes were greatest for the low-reward condition (M = −1.52, SD = 1.08) and smallest under the high-reward condition (M = −0.46, SD = 0.54), with the medium-reward...
condition in between \((M = -1.01, SD = 0.79), F(1, 105) = 29.34, p < .001\). Therefore, the less-leads-to-more effect was supported. More importantly, this effect was qualified by an interaction with freedom of choice, \(F(2, 102) = 16.12, p < 0.001\). Follow-up testing showed that the amount of reward effect was significant in the condition with freedom of choice, \(F(1, 51) = 77.93, p < 0.001\). However, the less-leads-to-more effect was not significant in the condition without freedom of choice, \(F(1, 51) = 1.91, p > 0.05\).

**DISCUSSION**

This study examined whether comparatively lower rewards would induce more adolescent players to change their attitudes toward online gaming (i.e., the less-leads-to-more effect) and whether the less-leads-to-more effect would be moderated by freedom of choice in performing attitude-discrepant behavior (i.e., writing an essay inconsistent with an initial attitude toward online gaming). The participants exhibited greater attitude changes when receiving a lower reward to engage in attitude-discrepant behavior, which was consistent with my predictions. Moreover, the less-leads-to-more effect was only prominent in the condition with freedom of choice. This echoes the findings of a classic study\(^{18}\) and further indicates that freedom of choice to engage in attitude-discrepant behavior moderates the less-leads-to-more effect.

With respect to limitations and future research directions, it should be noted that participants in the present study were Taiwanese adolescents. Markus and Kitayama\(^{19}\) suggested that individuals from cultures with high regard for individualism tend to be more sensitive to dissonance induced by attitude-discrepant behavior. Further cross-cultural studies may examine whether or not the less-leads-to-more effect in dissonance theory is culture-bounded. Punishments or threats also affect external justification. Dissonance often occurs in situations involving induced compliance, in which we are forced by ex-

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**Table 1. Means and Standard Deviations of the Measures**

<table>
<thead>
<tr>
<th>Measures by freedom of choice</th>
<th>Amount of reward</th>
<th>High</th>
<th>Mean</th>
<th>SD</th>
<th>Medium</th>
<th>Mean</th>
<th>SD</th>
<th>Low</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online games addiction</td>
<td>With freedom of choice</td>
<td>79.56</td>
<td>10.62</td>
<td></td>
<td>82.00</td>
<td>11.33</td>
<td></td>
<td>83.11</td>
<td>10.39</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Without freedom of choice</td>
<td>78.67</td>
<td>13.48</td>
<td></td>
<td>80.44</td>
<td>11.71</td>
<td></td>
<td>78.89</td>
<td>16.05</td>
<td></td>
</tr>
<tr>
<td>Attitude at pretest</td>
<td>With freedom of choice</td>
<td>4.73</td>
<td>0.72</td>
<td></td>
<td>5.05</td>
<td>0.98</td>
<td></td>
<td>4.80</td>
<td>0.70</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Without freedom of choice</td>
<td>4.48</td>
<td>0.54</td>
<td></td>
<td>4.93</td>
<td>0.91</td>
<td></td>
<td>4.56</td>
<td>0.50</td>
<td></td>
</tr>
<tr>
<td>Attitude at posttest</td>
<td>With freedom of choice</td>
<td>4.15</td>
<td>0.77</td>
<td></td>
<td>3.70</td>
<td>0.82</td>
<td></td>
<td>2.36</td>
<td>1.04</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Without freedom of choice</td>
<td>4.14</td>
<td>0.57</td>
<td></td>
<td>4.28</td>
<td>1.09</td>
<td></td>
<td>3.95</td>
<td>0.70</td>
<td></td>
</tr>
</tbody>
</table>

\(n = 18\) for each condition. Participants’ online games addiction was rated on a 4-point scale ranging from 29 to 116. The OAST was employed to measure participants’ attitude toward online gaming and its range was from 1 to 7.

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**Table 2. Means and Standard Deviations of Attitude Change**

<table>
<thead>
<tr>
<th>Freedom of choice</th>
<th>Amount of reward</th>
<th>High</th>
<th>Mean</th>
<th>SD</th>
<th>Medium</th>
<th>Mean</th>
<th>SD</th>
<th>Low</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>With</td>
<td></td>
<td>-0.58</td>
<td>0.42</td>
<td></td>
<td>-1.36</td>
<td>0.84</td>
<td></td>
<td>-2.44</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td>Without</td>
<td></td>
<td>-0.34</td>
<td>0.62</td>
<td></td>
<td>-0.65</td>
<td>0.54</td>
<td></td>
<td>-0.61</td>
<td>0.59</td>
<td></td>
</tr>
</tbody>
</table>

\(n = 18\) for each condition. Cell means were participants’ attitude change after receiving manipulation. Negative scores of attitude change revealed that participants’ initial attitude toward online gaming shifted to negative side.
ternal punishments or threats to do things inconsistent with our true attitudes. Future studies may examine whether threats or punishments affect the attitude changes of adolescent players caused by attitude-discrepant behavior (i.e., disengagement of online gaming) under induced compliance. Finally, it would be theoretically and practically interesting if we were to compare the relative benefits from different kinds of potential intervention or therapy techniques. Whether rewards or punishments would be more effective to induce attitude change on online gaming is worth for further investigation.

In conclusion, this study demonstrated that the less-leads-to-more effect can effectively induce change in adolescent players’ attitudes toward online gaming. Rewards appear necessary to induce adolescents initially interested in online gaming to engage in alternate recreational activities. However, the less-leads-to-more effect suggests that appropriate amounts of reward play a crucial role in determining game players’ attitude changes after attitude-discrepant behavior. Larger amounts of reward give players sufficient reason for external justification. Although adolescent players might engage in attitude-discrepant behavior under induced compliance, they would not change their prior attitudes toward online gaming. In general, insufficient rewards accompanied by freedom of choice may be a more effective strategy for inducing adolescents to disengage in online gaming.

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Address reprint requests to:
Dr. Wen-Bin Chioi
Center for Teacher Education
National Sun Yat-Sen University
70 Lien-Hai Rd.
Kaohsiung, Taiwan, Republic of China 804
E-mail: wbchioi@mail.nsysu.edu.tw