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Age and Violent-Content Labels Make Video Games Forbidden Fruits for Youth

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ABSTRACT

OBJECTIVE. To protect minors from exposure to video games with objectionable content (eg, violence and sex), the Pan European Game Information developed a classification system for video games (eg, 18+). We tested the hypothesis that this classification system may actually increase the attractiveness of games for children younger than the age rating.

PARTICIPANTS AND METHODS. Participants were 310 Dutch youth. The design was a 3 (age group: 7–8, 12–13, and 16–17 years) × 2 (participant gender) × 7 (label: 7+, 12+, 16+, 18+, violence, no violence, or no label control) × 2 (game description: violent or nonviolent) mixed factorial. The first 2 factors were between subjects, whereas the last 2 factors were within subjects. Three personality traits (ie, reactance, trait aggressiveness, and sensation seeking) were also included in the analyses. Participants read fictitious video game descriptions and rated how much they wanted to play each game.

RESULTS. Results revealed that restrictive age labels and violent-content labels increased the attractiveness of video games for all of the age groups (even 7- to 8-year-olds and girls).

CONCLUSIONS. Although the Pan European Game Information system was developed to protect youth from objectionable content, this system actually makes such games forbidden fruits. Pediatricians should be aware of this forbidden-fruit effect, because video games with objectionable content can have harmful effects on children and adolescents. Pediatrics 2009;123:870–876

There is a charm about the forbidden that makes it unspeakably desirable.

Mark Twain (1935)
The term “forbidden fruit” comes from the Biblical story in which God tells Adam and Eve to help themselves to any food in the Garden of Eden, except the fruit from the tree of knowledge of good and evil. Adam and Eve ate the fruit anyway, perhaps because God told them not to eat it. For video games, the forbidden-fruit hypothesis posits that age and content labels will increase interest in the labeled games, a so-called boomerang effect. Reactance theory has been hypothesized to be one of the mechanisms by which the forbidden-fruit effect happens. A basic assumption of reactance theory is that people like the freedom to behave according to their own wishes. When this freedom is threatened, people experience psychological reactance, an unpleasant emotional state that motivates them to restore the lost freedom. Restrictions can, therefore, make products more attractive to those for whom the restriction applies. If restrictive labels are placed on video games, reactance theory predicts that the labels will make the games more attractive to players for whom the restriction applies. Thus, we expect that PEGI age and content labels will increase the attractiveness of playing forbidden video games among underaged children and adolescents.

Rating systems for media can be divided into evaluative and descriptive ratings. Evaluative ratings, such as age labels, make recommendations regarding who should or should not be exposed to a specific game. In contrast, descriptive ratings, such as content labels, contain information about the (controversial) content of a media product. Some studies have found that evaluative ratings are more likely than descriptive ratings to attract audiences. However, when all of the studies were combined in a meta-analytic review, both types of labels increased attraction to violent media, and the 2 types of labels did not significantly differ. In addition, none of the studies included in the meta-analysis examined the effects of labels on attraction to video games. Therefore, we explored the effects of age and content labels on attraction to video games.

We predicted that adding an age label to a video game would make that game more attractive for children under the indicated age. We also predicted that adding a violence content label would make a game more attractive to children and adolescents of all ages. We also examined 3 personality traits that have been shown to affect risky, violent, and deviant behaviors: reactance, trait aggressiveness, and sensation seeking. We expected that age and content labels would have a stronger forbidden-fruit effect on children high on these traits than on children low on these traits. We expected larger forbidden-fruit effects for boys than for girls, because boys are the primary players of violent video games.

**PARTICIPANTS AND METHODS**

**Participants**

Participants were 310 Dutch children (50.6% boys) 7 to 17 years old (median age: 14.0 years; SD: 1.05 years). Participants were divided in 3 age groups: 7 to 8 (26.1%), 12 to 13 (39.7%), and 16 to 17 years old (34.2%). Parental consent was 100%.

**Design**

The study design was a 3 (participant age: 7–8, 12–13, and 16–17 years old) × 2 (participant gender) × 7 (label: 7+, 12+, 16+, 18+, violence label, no violence label, or no label control) × 2 (game description: violent or non-violent) mixed factorial. The first 2 factors were between subjects, whereas the last 2 factors were within subjects.

**Video Game Descriptions**

Twelve video game descriptions (6 violent and 6 non-violent) were selected from a pool of 40 fictitious descriptions (Fig 2 contains 3 descriptions). A random sample of middle school student judges (N = 76; mean age: 15.3 years; SD: 1.01 years; 49% boys) rated each description. Judges were told that the descriptions were for new games to be released soon. Judges rated how much they wanted to play each game and how boring they thought it would be (1, not at all, to 10, very much). After reverse-scoring boredom ratings, the 2 ratings were combined to form a single variable (r = 0.73; Cronbach’s α = .77). Desirability ratings did not differ for the 12 games (P > .15), indicating that the games were equally attractive without any labels. To increase robustness of findings, we used 3 variations of game descriptions for each age label condition (see Fig 1). The order of game descriptions was counterbalanced.
Next, participants reported their age, gender, and the number of hours that they played video games during the week. Finally, participants were thanked and debriefed.

RESULTS

Preliminary Analyses
Recall that there were 6 violent game descriptions and 6 nonviolent game descriptions within each label condition. Analyses revealed no significant differences between violent and nonviolent game descriptions within each condition (all $P > .21$). Thus, the data from video game descriptions were combined within each label condition (see Table 1). Furthermore, hours of game play did not significantly influence ratings of video game descriptions and were, therefore, discarded from further analyses.

Primary Analyses
To test the hypotheses regarding the PEGI age labels, a 3 (age group: 7–8, 12–13, and 16–17 years) $\times$ 2 (participant gender) repeated-measures multivariate analysis of variance was conducted. The 3 personality traits were included as covariates. To test the hypotheses concerning the content labels, a 3 (age group) $\times$ 2 (participant gender) repeated-measures multivariate analysis of variance was conducted, including the 3 personality traits as covariates. Contrast analyses were used to compare the mean of every age label to the mean of the next, subsequent, age label. These successive repeated-contrast effects measure whether the difference between 2 subsequent age labels is significant. Thus, we compared every age label with the next age label for each age group.

Age, Gender, and Attractiveness of Games Labeled With PEGI Age Labels
Multivariate results showed a significant effect of age labels on likability of video games (Wilks’ $\Lambda = .38$; $F_{3,301} = 123.91$; $P < .0001$; $\eta^2_p = .62$). Results of the contrast analysis showed a significant linear relationship of likability across the different age labels ($F_{1,304} = 469.37$; $P < .0001$; $\eta^2_p = .61$; see Fig 3). The more restrictive the age label, the

Procedure
Participants read 12 game descriptions with either an age or a content label and rated how much they wanted to play each game and how boring they thought it would be. Ratings were made on 10-point rating scales (1: not at all; 10: very much). After reverse scoring the boring ratings, the 2 items were combined ($r = 0.75$; $P < .01$; Cronbach’s $\alpha = .78$). To assist the young children (7–8 years old) who had difficulty reading, a “card-reading procedure” was followed in which the researcher read aloud the text while the children held a card under the line that was read. Thus, the child could both hear and read the question-and-answering options.

Next, 3 personality traits were measured: reactance, sensation seeking, and trait aggressiveness. Reactance was measured using an adjusted version of the Therapeutic Reactance Scale. The original list of 28 items was reduced to 8 items that were understandable for participants of all ages (eg, “If I am told what to do, I often do the opposite”; Cronbach’s $\alpha = .79$). Sensation seeking was measured using a 2-item scale (eg, “I like to do risky things, even if they are dangerous”; Cronbach’s $\alpha = .83$). Trait aggressiveness was measured using the 9-item physical aggression subscale of the Aggression Questionnaire (eg, “If somebody hits me, I hit back”; Cronbach’s $\alpha = .89$).

TABLE 1 Likability of Game Descriptions

<table>
<thead>
<tr>
<th>Likability</th>
<th>Boys</th>
<th></th>
<th>Girls</th>
<th></th>
</tr>
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<tbody>
<tr>
<td></td>
<td>7–8 y Mean</td>
<td>12–13 y Mean</td>
<td>16–17 y Mean</td>
<td>7–8 y Mean</td>
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<tr>
<td>7+ label</td>
<td>5.973</td>
<td>4.885</td>
<td>4.278</td>
<td>6.116</td>
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<td>12+ label</td>
<td>7.803</td>
<td>6.665</td>
<td>5.935</td>
<td>6.354</td>
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<tr>
<td>16+ label</td>
<td>7.691</td>
<td>7.100</td>
<td>6.843</td>
<td>7.256</td>
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<tr>
<td>18+ label</td>
<td>8.868</td>
<td>8.219</td>
<td>8.259</td>
<td>7.186</td>
</tr>
<tr>
<td>Violent content label</td>
<td>8.829</td>
<td>8.108</td>
<td>8.260</td>
<td>7.408</td>
</tr>
<tr>
<td>Nonviolent content label</td>
<td>5.184</td>
<td>4.631</td>
<td>3.982</td>
<td>4.605</td>
</tr>
<tr>
<td>No label (control)</td>
<td>5.248</td>
<td>5.408</td>
<td>5.505</td>
<td>4.529</td>
</tr>
</tbody>
</table>

The sample sizes for 7- to 8-, 12- to 13-, and 16- to 17-year-old boys were 38, 65, and 54, respectively. The sample sizes for 7- to 8-, 12- to 13-, and 16- to 17-year-old girls were 43, 58, and 52, respectively.
more participants wanted to play the video game. Note that the effect sizes are exceptionally large.

There was a significant interaction between age groups and age labels (Wilks’ $\Lambda = .84$; $F_{4,602} = 7.10; P < .0001; \eta^2_p = .09$). Although the 16+ and 18+ age labels increased attraction to video games in players of all ages, the increase was strongest for 16- to 17-year-olds. Overall, likability ratings were highest for the lowest age group (see Fig 3).

There was also a significant interaction between participant gender and age labels (Wilks’ $\Lambda = .81$; $F_{4,301} = 17.36; P < .0001; \eta^2_p = .19$; see Fig 4). Although restrictive age-based labels increased attraction to video games for boys and girls, the effect was stronger for boys ($F_{1,304} = 24.56; P < .0001; \eta^2_p = .14$).

**Personality Traits and Attractiveness of Games Labeled With PEGI Age Labels**

All of the analyses for age labels remained significant after controlling for the personality traits. Trait aggressiveness and sensation seeking did not significantly contribute to the results. However, reactance interacted with age labels to influence attraction to video games (Wilks’ $\Lambda = .89$; $F_{4,297} = 9.33; P < .0001; \eta^2_p = .11$).

Contrast analyses showed a significant linear effect ($F_{1,300} = 32.90; P < .0001; \eta^2_p = .10$), indicating that people high in reactance were most attracted to games with more restrictive age labels (12+, 16+, and 18+) and were less attracted to games with no labels or less restrictive age labels (7+).

**Age, Gender, and Attractiveness of Games Labeled With PEGI Content Labels**

Multivariate analysis showed that violence content labels increased attraction to video games (Wilks’ $\Lambda = .54$; $F_{2,303} = 131.64; P < .0001; \eta^2_p = .47$). Results of a planned contrast showed that video games with violence content labels were preferred over comparable games with nonviolence labels or no content labels ($F_{1,304} = 254.046; P < .0001; \eta^2_p = .46$).

There was a significant interaction between age group and violence content label (Wilks’ $\Lambda = .97$; $F_{4,606} = 2.64; P < .04; \eta^2_p = .02$). Results of a planned contrast showed that adding a violence content label had the strongest effect on the youngest video game players ($F_{1,304} = 4.87; P < .008; \eta^2_p = .03$; see Fig 5).

There also was a significant interaction between participant gender and violence content label (Wilks’ $\Lambda = .93$; $F_{2,303} = 11.07; P < .0001; \eta^2_p = .07$; see Fig 6). A significant quadratic trend was found for boys ($F_{1,304} = 20.17; P < .0001; \eta^2_p = .06$), which showed that boys were most attracted to games with violence content labels and least attracted to games with nonviolence labels. A significant linear trend was found for girls ($F_{1,304} = 8.69; P < .003; \eta^2_p = .03$), which showed that girls were most attracted to games with violence labels.

**Personality Traits and Attractiveness of Games Labeled With PEGI Content Labels**

All of the analyses for violent-content labels remained significant after controlling for the personality traits. However, trait aggressiveness and reactance significantly moderated the effects of violent-content labels on attraction to video games. There was a significant interaction between trait aggressiveness and violence content label (Wilks’ $\Lambda = .977$; $F_{2,299} = 3.59; P < .03; \eta^2_p = .02$). As
ors. In addition, adolescent boys find antisocial behavior appealing, and they are likely to experiment with "forbidden behaviors." Playing video games with restrictive labels might be a way for boys to vicariously obtain satisfaction through thrills and antisocial behavior.

Participants high in psychological reactance were also more strongly affected by age and content labels than others were. Previous research showed that high-reactance participants were especially interested in viewing programs with warning labels. Our study confirms the importance of reactance in forbidden-fruit effects for video games. Similarly, individuals high in trait aggressiveness were more attracted to video games with violence content labels than were others.

Consistent with meta-analytic findings, we found no difference between age-based labels and violent-content labels. Both types of restrictive labels made video games forbidden fruits. Apparently, both types of labeling indicate controversial content that attracts youngsters to these games.

Although PEGI is mainly meant as a guideline for parents, children are also exposed to the labels. Research shows that the majority of parents believe that it is necessary to have media labeled; however, other research shows that parents rarely use the labels. Moreover, our results show that attempts to restrict exposure and access to video games with objectionable content backfire among youth and increase their interest in labeled games. Therefore, the question is how to avoid a boomerang effect while informing the public about potentially harmful effects of violent games. Given the appeal of objectionable content for youth, additional research is needed to explore effective means for policymakers and parents to intervene in violent media use. For young children, mediation by parents or other caregivers has been shown to be successful. Thus, parents should be more involved and should monitor their children's behavior while they play the games and after the games are turned off. For example, it is much easier for parents to monitor the video games their child plays if the game consoles and computers are in a public location in the home (e.g., the family room), rather than in the child's private bedroom. For adolescents, however, parental mediation is less successful. Future research should focus on finding effective interventions to mitigate the harmful effects of playing video games with objectionable content on children, especially in adolescents. A previous study on television violence interventions found that direct critical comments backfired for youth. Researchers have argued that more subtle approaches are more effective for adolescents, such as using questions rather than making pronouncements. One approach might include presenting different perspectives on the content of violent video games. For example, future research could test whether focusing on the victim's suffering rather than on the perpetrator's violent acts reduces the potential negative effects of playing video games. Preliminary results found that such a shift in focus produced an increase in empathy.

In general, our results suggest that pediatricians who deal with children and adolescents who have a heavy diet of violent video games should use a subtle approach.
They should be aware of the fact that direct pronouncements of disapproval can have boomerang effects, especially in those who are already high in trait reactance.

Furthermore, effective violence prevention requires an understanding of norms regarding parental attitudes and practices. By understanding the spectrum of parental attitudes, community-sensitive interventions for violence prevention can be developed.19

For parents, our results suggest that children should not be allowed to buy their own games, even if they think they are old enough to do so. Both parents and pediatricians should also be aware of other risk factors and warning signs, such as low school performance among heavy game players. In line with the American Academy of Pediatrics, we believe that health providers have an emerging role in youth violence prevention and should be proactive in addressing violence prevention in child and adolescent health supervision.40,41 Children may be more likely to listen to their pediatrician than to their parents.

Our study, like all studies, has its limitations. In our study, we used only 1 type of content label (ie, violence), although meta-analytic findings have shown similar effects for sexual content labels.10 Little is known about other types of content labels, such as profanity. We used a Dutch sample, although similar effects have been found in samples from other countries.10 Furthermore, the PEGI labels used in our study are only used in Europe, although comparable labels are used in the United States.

CONCLUSIONS
An important implication for pediatricians, parents, and policy-makers is that age and violent-content labels do not prevent youngsters from playing games with objectionable content. Instead, our results show that labels have the opposite effect: they increase attraction to video games with objectionable content. Our results contribute to the current discussion in the United States to prevent minors from purchasing violent video games, and the discussion in Europe about whether violent video games should be forbidden.42 Our findings suggest that video games should not be forbidden, to avoid turning them into forbidden fruits. Forbidden video games will just become unspeakably desirable for the children we want to protect.

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**SOME BIG FOOD COMPANIES ADOPT NUTRIENT STANDARDS**

“In an effort to reduce confusion in the grocery aisle and help consumers buy healthier foods, some of the nation’s largest food and beverage companies have agreed to accept common nutritional standards and to use the same logo on their packages to denote the products that qualify. The Smart Choices Program logo signifies foods that limit unhealthy ingredients and feature healthy ones. The standards and the logo were developed by the food companies in collaboration with scientists, retailers and academics as part of the ‘Smart Choices Program,’ which is expected to be introduced in stores in the middle of 2009. Products that qualify under the program’s nutrition guidelines will have the Smart Choices logo, a check mark, on the front of the package along with the amount of calories per serving and the number of servings in the package. Some details are still being worked out, but the participants in the program are expected to include Coca-Cola, ConAgra Foods, General Mills, Kellogg, Kraft Foods, PepsiCo, Unilever and Wal-Mart. For most categories, the products must also provide nutrients or food groups that are recommended by nutritionists for good health. The ‘nutrients to encourage’ include calcium, potassium, fiber, magnesium, vitamin A, vitamin C and vitamin E, while the encouraged food groups are fruits and vegetables, whole grains, and dairy products that are low in fat and fat free.”

Noted by MG, MD
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