

# Behavioral Correlates of Television Viewing in Primary School Children Evaluated by the Child Behavior Checklist

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**Background:** Television is a source from which children gain information about life and experience different types of behavior. The Child Behavior Checklist (CBCL) has not been used thoroughly to evaluate the behavioral effects of television viewing on children.

**Objective:** To examine the competency and problem behavior correlates of television viewing in school-aged children using the CBCL.

**Design:** Cross-sectional survey.

**Setting:** Two randomly selected grade schools, one from a high-income district and the other from a low-income district.

**Participants:** Students in grades 2 and 3 and their parents.

**Main Outcome Measures:** A questionnaire on children's time spent watching television and engaging in other daily activities and the CBCL were sent to the parents of 888 second- and third-grade students.

**Results:** Results of the questionnaire reported that the overall mean  $\pm$  SD daily television viewing time was

2.5  $\pm$  1.3 hours. Overall television viewing time had a negative correlation with social and school achievement ( $r = -0.17$ ,  $P < .001$  and  $r = 0.11$ ,  $P = .03$ , respectively) subscale scores. Withdrawn ( $r = 0.11$ ,  $P = .004$ ), social problem ( $r = 0.14$ ,  $P = .001$ ), thought problem ( $r = 0.11$ ,  $P = .03$ ), attention problem ( $r = 0.20$ ,  $P < .001$ ), delinquent behavior ( $r = 0.12$ ,  $P < .001$ ), aggressive behavior ( $r = 0.22$ ,  $P < .001$ ), and externalization ( $r = 0.19$ ,  $P < .001$ ) subscales and total problem ( $r = 0.15$ ,  $P < .001$ ) scores were positively correlated with time spent watching television. Stepwise logistic regression analysis revealed that the only significant variables associated with a risk of watching television for more than 2 hours were age, gender, social subscale, and attention problem subscale scores of the CBCL.

**Conclusion:** As evaluated by the CBCL, television viewing time is positively associated with social problems, delinquent behavior, aggressive behavior, externalization, and total problem scores. Older age, male gender, and decreasing social subscale and increasing attention problem subscale scores on the CBCL increases the risk of watching television for more than 2 hours.

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**C**HILDREN LEARN about life, exercise problem solving skills, and develop their own character by watching and experiencing the world around them. It has been stated that the average child or adolescent in United States watches an average of 3 hours of television per day,<sup>1</sup> and by the time he or she reaches 70 years of age, he or she will have spent the equivalent of 7 to 10 years watching television.<sup>2</sup>

Television gives children a distorted image of the world, as children have difficulty in discriminating reality from fantasy on television.<sup>3</sup> The results of the cultivation effect of television<sup>4</sup> on children are widely studied, but the effects of television on human beings are too compli-

cated to study thoroughly and then to specify cause-effect relationships.

Violence is the most widely studied subject in the field of pediatrics, and 2 recent meta-analyses<sup>5,6</sup> investigating the relationship between violence viewed on television and aggressive behavior in children concluded that exposure to portrayals of violence on television was associated consistently with children's aggressive behavior. Other studies have blamed television for causing conduct disorder, symptoms of psychological trauma, social skill difficulties,<sup>7,8</sup> anorexia nervosa,<sup>9,10</sup> nutritional changes, dieting and obesity,<sup>11</sup> and substance use and abuse,<sup>12,13</sup> and for negatively affecting sexuality<sup>12</sup> and body concept and self-image.<sup>14</sup> The effect of television on school performance is also widely

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studied; there are reports of positive and negative effects.<sup>15-17</sup> Social status and intelligence quotient seem to play important roles,<sup>18</sup> as does the content of the programs viewed.<sup>19,20</sup>

The Parent Report form of the Child Behavior Checklist (CBCL) is widely used to assess behavioral problems and social competency of children aged 4 through 16 years. It has strong psychometric properties.<sup>21</sup> To our knowledge, the CBCL has not been used thoroughly to examine the effects of television viewing on child behavior. This study was performed to examine the competency and problem behavior correlates of television viewing using the CBCL in school-aged children.

## PARTICIPANTS, MATERIALS, AND METHODS

The study was performed between March 2000 and June 2000 in Ankara, Turkey. Two primary schools were selected randomly: one from a low socioeconomic status (SES) district and the other from a high SES district. Subjects were in the second and third grades, 472 from a low SES, and 414 from a high SES district. The study was approved by Hacettepe University Institute of Child Health (Ankara). After giving informed oral consent, parents were asked to fill out a questionnaire and the CBCL. The questionnaire contained questions about the parent's and the child's television viewing habits, including the time the child spent watching television vs engaging in other daily activities.

The American Academy of Pediatrics recommends 1 to 2 hours of television watching per day, while it has been reported that an average child watches 3 hours per day.<sup>1</sup> Taking these into consideration, children were separated into 3 groups according to the time they spent watching television as reported in the questionnaires: children watching 2 hours or less constituted the low television watching group (group 1), children watching 2 to 4 hours constituted the medium television watching group (group 2), and children watching more than 4 hours constituted the high television watching group (group 3). To evaluate the reliability of the parent-reported television viewing time in the questionnaires, a subgroup was selected. Ten percent of the children from each SES (n=90) were selected randomly and the parents were asked to fill out a diary for 7 days. The diary was divided into hourly periods and parents recorded the activities of their child for each period. The correlation between the diary- and questionnaire-reported television viewing time was evaluated.

The CBCL consists of competency and problem scores. The competency scores of the CBCL are school achievement, social, and activity scores. From these 3 scales, a total competency score is obtained. The problem scores within the checklist are somatic complaint, withdrawn, anxious/depressed, social problem, thought problem, attention problem, delinquent behavior, aggressive behavior, and sex problem. Scores from all of these problem scales constitute the total problem score. In addition, 2 broadly based scales labeled internalizing (consisting of anxious and withdrawn scores) and externalizing (consisting of delinquent behavior and aggressive behavior) are available. The test was adapted for Turkish children.<sup>22</sup> All of the competency and problem scores were calculated and used. Raw scores were used for CBCL analysis. The physical health effects of television viewing in these children were also evaluated and reported elsewhere.<sup>23</sup>

The data were analyzed by the *t* test, Pearson correlation test, partial correlation test, and 1-way analysis of variance. As the data did not fulfill the criteria for normal distribution, stepwise logistic regression was performed. The outcome variable was defined as time spent watching television. Children watching television for 2 hours or less constituted the control group

**Table 1. Television Viewing Time of Children According to Socioeconomic Status (SES) and Gender**

	No. of Children	Weekdays	Weekend	Daily
High SES	415	2.0 ± 1.3	3.2 ± 1.9	2.4 ± 1.3
Low SES	470	2.1 ± 1.2	3.4 ± 2.0	2.5 ± 1.2
<i>P</i> value	...	.14	.36	.2
Girls	444	2.0 ± 1.2	3.3 ± 2.1	2.4 ± 1.3
Boys	441	2.2 ± 1.2	3.3 ± 1.8	2.5 ± 1.2
<i>P</i> value	...	.06	.98	.26

\*Data are given as mean ± SD hours per day. Ellipses indicate not applicable.

and those watching more constituted the risk group. This cut-off value was also in accordance with the current recommendations of television watching hours.<sup>1</sup> The tests were performed using SPSS version 9.0 (SPSS Inc, Chicago, Ill).

## RESULTS

Parents of 689 second- and third-grade students (78% of parents), 368 from a low and 321 from a high SES district, answered the questionnaires. Of the students, 346 were girls and 343 were boys. The mean ± SD age of the students was 7.95 ± 0.77 years.

The mean ± SD daily viewing time according to the questionnaires was 2.1 ± 1.2 hours during the weekdays, 3.4 ± 2.1 hours during the weekends, and 2.5 ± 1.3 hours overall. Television viewing time did not differ by SES, although gender seemed to have some effect (**Table 1**).

Diaries were filled out by 84 parents, 37 from the high and 47 from the low SES district. Among these children, 39 were boys and 45 were girls. The SES and gender distribution of this subgroup was similar to the whole group (*P* > .05). The overall daily mean ± SD television viewing time reported from diaries was 2.5 ± 1.2 hours. There was a moderate but significant correlation between the television viewing time reported by the questionnaire and that reported by the diary (*r* = 0.6, *P* < .001).

The mean raw CBCL scores according to the time spent watching television are presented in **Table 2**. Group 3 had higher scores than group 1 for withdrawn, social problem, thought problem, attention problem, delinquent behavior, aggressive behavior, and externalization subscales and for total problem scale, and had lower social subscale scores. Group 3 scores were also higher than group 2 for social problem, aggressive behavior, and externalization subscale score. Group 2 had scores higher than group 1 for attention problem, aggressive behavior, sex problem, externalization subscales, and total problem scores, and had lower scores for social and school achievement subscales.

Overall television viewing time was negatively correlated with social and school achievement subscale scores (*r* = -0.17, *P* < .001 and *r* = 0.11, *P* = .03, respectively). Scores for withdrawn (*r* = 0.11, *P* = .004), social problem (*r* = 0.14, *P* = .001), thought problem (*r* = 0.11, *P* = .03), attention problem (*r* = 0.20, *P* < .001), delinquent behavior (*r* = 0.12, *P* < .001), aggressive behavior (*r* = 0.22, *P* < .001), and externalization (*r* = 0.19, *P* < .001) subscales and total prob-

**Table 2. Child Behavior Checklist Scores of Children Grouped According to Daily Television Viewing Hours\***

	Group 1 (n = 298)	Group 2 (n = 323)	Group 3 (n = 68)	P
Activity	3.8 ± 2.2	3.8 ± 2.3	3.9 ± 2.0	.94
Social	6.3 ± 1.5	5.8 ± 1.4	5.5 ± 1.6	<.001†
School achievement	5.1 ± 0.7	4.8 ± 0.9	4.7 ± 0.7	.02‡
Total competence	15.1 ± 3.2	14.4 ± 3.2	14.4 ± 3.0	.05
Withdrawn	2.5 ± 2.5	3.1 ± 2.7	3.4 ± 2.5	.03§
Somatic complaints	1.5 ± 1.9	1.5 ± 2.0	1.5 ± 1.6	.86
Depression and anxiety	5.4 ± 4.1	6.0 ± 4.1	6.1 ± 4.0	.24
Social problems	1.7 ± 1.7	2.1 ± 1.8	2.7 ± 2.3	.001
Thought problems	0.8 ± 1.2	1.1 ± 1.3	1.3 ± 1.4	.01§
Attention problems	3.5 ± 2.9	4.6 ± 2.8	5.5 ± 3.7	<.001†
Delinquent behavior	1.2 ± 1.4	1.4 ± 1.8	1.8 ± 1.9	.02§
Aggressive behavior	5.8 ± 4.8	7.1 ± 5.6	10.4 ± 7.6	<.001¶
Sex problems	0.1 ± 0.5	0.2 ± 0.7	0.3 ± 0.6	.04‡
Internalization	9.5 ± 7.0	10.5 ± 7.1	10.3 ± 6.6	.28
Externalization	7.2 ± 6.1	8.9 ± 7.4	11.3 ± 8.7	<.001¶
Total problem	27.0 ± 16.4	30.8 ± 17.7	35.8 ± 21.4	.001†

\*Data are given as mean ± SD. Group 1 watched ≤2 hours; group 2, 2-4 hours; and group 3, ≥4 hours of television.

†Group 1 is different from groups 2 and 3.

‡The difference is between groups 1 and 2.

§The difference is between groups 1 and 3.

||Group 3 is different from groups 1 and 2.

¶Group 1 is different from groups 2 and 3, group 3 is different from group 2.

**Table 3. Association Between Age, Gender, Child Behavior Checklist Scores, and Risk of Watching Television for More Than 2 Hours\***

	OR (95% CI)	P
Age	1.330 (1.038-1.702)	.02
Male	1.598 (1.110-2.301)	.01
Social problem	0.847 (0.748-0.958)	.008
Attention problem	1.138 (1.066-1.213)	<.001

\*OR indicates odds ratio; CI, confidence interval.

lem scale ( $r=0.15$ ,  $P<.001$ ) were positively correlated with the time spent watching television. Although these correlations were significant statistically, they were of low grade.

When controlled for gender and SES, the correlation between television viewing time and social problem ( $r=0.36$ ,  $P=.02$ ), delinquent behavior ( $r=0.43$ ,  $P=.005$ ), and aggressive behavior ( $r=0.43$ ,  $P=.005$ ) scores did not only persist but also became stronger. The correlation between television viewing time and externalization scores ( $r=0.18$ ,  $P<.001$ ) and total problem ( $r=0.15$ ,  $P<.001$ ) scores persisted at a lower strength.

To analyze the interactions of age, gender, SES, CBCL scores, and television watching time, stepwise logistic regression was applied, as the data did not fit a normal distribution. The coefficient of regression results are presented in **Table 3**. The sensitivity of this model was 79.9% and the specificity was 40.3%. It was found that the only significant variables associated with a risk of watching television for more than 2 hours were age, gender, and social and attention problem subscale scores of the CBCL.

## COMMENT

In this cross-sectional survey, the association between time spent watching television and child behavior was examined. One of the critical points of this study is the method of determination of television viewing time. Earlier methodological studies have concluded that the most reliable method to determine television-viewing time is the diary method but have stated that the questionnaire method has a moderate and significant correlation with the diary method.<sup>24</sup> We selected a subgroup of students and asked the parents to fill out 7-day diaries to evaluate the reliability of the questionnaire-reported viewing time. There was a moderate and significant correlation between diary- and questionnaire-reported television viewing time in our study group. The second critical point of the study is the cross-sectional design, used so that no causal relationship between television watching time and behavioral problem could be concluded. Only associations were demonstrated and the direction of association may be either way. Either children with a behavioral problem watch more television or children watching more television have a behavioral problem or both.

For years, researchers have studied the effects of television watching, with the effects of television violence being of primary concern. Television violence is as prevalent in Turkish programming as in countries all over the world.<sup>16</sup> Although there are studies reporting the contrary, most researchers agree that television violence causes aggressive behavior. It is not easy to perform a study that will explain the causal relationship between television violence and aggression, but the evidence gathered thus far suggests that a relationship exists in some way.<sup>5,6</sup> In our study, children in group 3, who watched the most television, were found to have higher scores in delinquent behavior and aggres-

sive behavior subscales than those in group 1. The aggressive behavior subscale scores of group 2 were also higher than the scores of group 1. Further strengthening the relationship, television viewing time was found to be correlated positively with these 2 scores. In a recent intervention study by Robinson et al,<sup>25</sup> it was shown that decreasing exposure to television decreased aggressive behavior in children in the third and fourth grades. In our study and in that study, program selection was not made. Both studies show that increased television exposure is positively associated with aggressive behavior irrespective of the content of the programs. Apart from the content of the programs, the duration of viewing seems to be a determinant of aggressive behavior. However, stepwise logistic regression showed a significant association only between social subscale and attention problem subscale scores of the CBCL and the risk of watching television for more than 2 hours. The risk of watching television for more than 2 hours increased by 16% for each unit decrease in social subscale score. After stepwise regression analysis, no association was found between television viewing and delinquent behavior and aggressive behavior subscale scores. Thus, it was speculated that not only the prolonged television viewing but perhaps the inactivity and social isolation while watching television may have contributed to increased aggressive behavior scores.

Besides violence, school performance is the second most popular subject studied with regard to the effects of watching television. There are reports on both positive and negative effects.<sup>15,17,18,26-28</sup> The study performed by Williams et al<sup>27</sup> in Canada supports a negative effect. In that study, children living in a town that had not yet received television transmission were found to have better reading scores than another town that had television. It was also shown that the difference disappeared 2 years after the introduction of television to the first town. On the other hand, it is also suggested that just as violence can be learned from television, so can words and other useful information; thus, television can affect school achievement positively. In 1984, children watching television for 1 to 2 hours were reported to have better reading scores than children watching less, but this effect did not persist when viewing time increased further.<sup>15</sup> Reports from Canada and Finland claimed that television had a positive effect on word knowledge and general information but a negative effect on mathematics and reading.<sup>28</sup>

In our study, school achievement subscale scores of group 1 children, who watched the least amount of television, were found to be higher than the scores of group 2. The school achievement scores of group 3 children, who watched the greatest amount of television, were the lowest, but the difference was not found to be significant. This may be because of the number of children in group 3. Furthermore, this score was found to be negatively correlated with television viewing time.

One of the reasons a negative association between watching television and school achievement was found may be that our study methods did not consider the program contents viewed. Recently, it has been shown that the particular content viewed is of great importance. Children who watch programs with educational content receive better grades in school.<sup>19,20</sup>

There was no association between the time spent viewing television and the time spent reading and studying that may have contributed to the low school achievement in group 3. However, group 1 was found to have lower attention problem scores than groups 2 and 3. Also, we found attention problem scores to be positively associated with television viewing time. Although no association between school achievement and television viewing time could be demonstrated after stepwise logistic regression, the association persisted for attention problem scores. It was found that for each unit increase in attention problem scores, the risk of watching television for more than 2 hours increased by 13%. Attention problems may also contribute to decreased school achievement. However, as pointed out earlier, such a cross-sectional survey is not suitable for determining a cause-effect relationship (children with attention problems may be watching television more), and to our knowledge, there is no study in the literature that reports a direct relationship between television viewing and attention problems. We believe this association should be evaluated further.

It has been revealed that television affects the development of gender identity in the child and, unfortunately, stereotyped and distorted images of females and males and their relationships are most often depicted. In the television world, men are more often portrayed in positions of employment, have higher-status positions than women, and are autonomous, powerful, and violent. Women are underrepresented; they are young, have less personal power, and are usually portrayed in domestic locations. Working women are less likely to be married, and if married, they are less likely to be successfully married.<sup>29,30</sup> Sexual relationships develop rapidly, the risk of pregnancy is rarely considered, and adolescence is portrayed as a constant state of sexual crisis.<sup>31,32</sup> In our study, although a correlation could not be detected between television viewing time and the sex problem subscale scores of the CBCL, group 1 had the lowest and group 3 the highest scores (group 2 was in between). Only the difference between groups 1 and 2 was significant. Keeping in mind that our study group was composed of students in grades 2 and 3, this association may become more manifest during adolescence.

The stepwise logistic regression also revealed a positive association between age and the risk of watching television for more than 2 hours. It was found that for each 1-year increase in age, the risk of watching television for more than 2 hours increased by 33% in this age group (7-10 years) of children. Stepwise analysis also found a significant association between gender and watching television. Male gender increased the risk of watching television for more than 2 hours by 1.6 times. In the literature, there are different results for the association between gender and watching television.<sup>33,34</sup>

Data from the CBCL also showed a positive association between scores on thought problem, withdrawn, and social problem subscales and television viewing time. Withdrawn and social problem scores of group 3 were higher than those of group 1, and social problem scores of group 3 were higher than those of groups 1 and 2. When controlled for SES and gender, the association between television viewing time and scores on with-

### What This Study Adds

The relationship between television watching and aggressive behavior, nutritional disorders, school achievement, sexual problems, and social problems has been studied using different methods. In this study, the behavioral association of television viewing was evaluated using the CBCL without considering the content of the programs. Television watching time was found to be positively associated with social problem, delinquent behavior, and aggressive behavior subscale scores of the CBCL. Stepwise logistic regression revealed a significant association of male gender, older age, decreasing social subscale, and increasing attention problem subscale scores of the CBCL with the risk of watching television for more than 2 hours per day. It was concluded that irrespective of the program content, television viewing time was positively associated with problem behavior scores and negatively associated with competence scores of the CBCL.

drawn and thought problem subscales disappeared, but the association with social problem subscale scores became stronger. Still, none of these were found to be associated with television viewing time in stepwise logistic regression.

Moller-Nehring et al,<sup>8</sup> examining patients between 1989 and 1994, reported that spending more time watching television is related to the appearance of conduct disorders. Singer et al,<sup>7</sup> studying 2245 third- through eighth-grade students, claimed that showing signs of psychological trauma can be related to watching television. The results of our study and others are not enough to blame television for causing conduct disorder or other psychological problems, but they are serious enough to consider television watching as a risk factor for behavioral problems and to suggest that physicians consider their patients' television viewing habits.<sup>35</sup> The association between watching television and behavioral problems may be in either direction. Children with behavioral problems may watch television longer or prolonged television watching may cause behavioral problems. In either direction, it deserves further consideration. Prolonged television watching may be considered to be one of the new symptoms of this era of technology, and it deserves more attention and evaluation in every aspect. Families should be advised to restrict the television viewing hours of their children and to encourage them to participate in active peer relationships.

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