

# Parental Sedentary Restriction, Maternal Parenting Style, and Television Viewing Among 10- to 11-Year-Olds



**WHAT'S KNOWN ON THIS SUBJECT:** High TV-viewing levels are associated with a number of health risks. Parenting styles and practices have been associated with youth physical activity and dietary behaviors, but it is not clear whether parenting behaviors are associated with youth TV viewing.



**WHAT THIS STUDY ADDS:** Youths who have 2 parents who restrict sedentary time are less likely to watch large amounts of TV, whereas permissive parenting is associated with high levels of TV viewing. Restricting sedentary time and reducing permissive parenting may reduce youth TV viewing.

## abstract

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**OBJECTIVE:** To examine whether parenting styles or practices were associated with children's television (TV) viewing.

**METHODS:** A total of 431 parent-child dyads (10- to 11-year-old children) from Bristol, United Kingdom, were included. Child and parent TV viewing were self-reported and categorized as <2, 2 to 4, or >4 hours/day. Children reported maternal parenting style (authoritarian, authoritative, or permissive). Child-reported maternal and paternal sedentary restriction scores were combined to create a family-level restriction score. Multinomial logistic regression was used to examine whether child TV viewing was predicted by parenting style or family restriction.

**RESULTS:** A greater proportion of children with permissive mothers watched >4 hours of TV per day, compared with children with authoritarian or authoritative mothers ( $P = .033$ ). A greater proportion of children for whom both parents demonstrated high restriction watched <2 hours of TV per day ( $P < .001$ ). The risk of watching 2 to 4 hours (vs <2 hours) of TV per day was 2.2 times higher for children from low-restriction families ( $P = .010$ ). The risk of watching >4 hours (vs <2 hours) of TV per day was 3.3 times higher for children from low-restriction families ( $P = .013$ ). The risk of watching >4 hours of TV per day was 5.2 times higher for children with permissive (versus authoritative) mothers ( $P = .010$ ).

**CONCLUSIONS:** Clinicians need to talk directly with parents about the need to place limitations on children's screen time and to encourage both parents to reinforce restriction messages. *Pediatrics* 2011;128:e572–e578

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### KEY WORDS

screen-viewing, behavior change, children, prevention

### ABBREVIATIONS

AAP—American Academy of Pediatrics

RRR—relative risk ratio

CI—confidence interval

IMD—Index of Multiple Deprivation

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Higher levels of television (TV) viewing have been associated with an increased risk of obesity<sup>1</sup> and increased psychological difficulties<sup>2,3</sup> among youths. The American Academy of Pediatrics (AAP) recommends that children's TV viewing should be limited to 1 to 2 hours of quality programming per day.<sup>4</sup> Data from the National Health and Nutrition Examination Survey between 2000 and 2006 indicated that 33% of youths exceeded the upper threshold of the AAP TV-viewing guidelines. Similarly, recent data from a cross-sectional survey of 1013 children 10 to 11 years of age in Bristol, United Kingdom, showed that 27% of girls and 30% of boys in the study watched >2 hours of TV per day.<sup>3</sup> In addition, 20% of US youths<sup>5</sup> and 14% of UK youths<sup>3</sup> watched >4 hours of TV per day. Collectively, these studies illustrate the need to develop strategies to reduce TV-viewing time.

The mediating-variable model suggests that, to develop effective strategies to change behavior, we need to identify mediators of that behavior and then we need to find ways to change the intermediary variables.<sup>6</sup> We reported recently that high levels of parent TV viewing were associated with high levels of youth TV viewing,<sup>7</sup> but it is not clear why this is the case.

Parenting styles describe how a parent communicates with his or her child.<sup>8</sup> Four parenting styles have been defined, namely, authoritarian (demand obedience), authoritative (use reasoning), permissive (acquiesce to child's demands), and uninvolved. Although authoritative parenting has been associated with greater fruit and vegetable consumption among youths,<sup>9,10</sup> we reported recently that permissive parenting is associated with higher levels of physical activity among youths.<sup>11</sup> This finding, which is supported by recent US data,<sup>12</sup> suggests that parenting styles may affect

these 2 energy-balance behaviors differently.<sup>13</sup> Examining how parenting styles are associated with TV-viewing time would enhance information on how parenting styles are associated with energy-balance behaviors.

Parenting practices describe context-specific behaviors such as what a parent does to reduce child TV viewing.<sup>14,15</sup> A range of TV-related parenting practices and beliefs have been examined as predictors of children's TV viewing. Research shows that children watch more TV when their parents watch TV frequently,<sup>16–19</sup> watch TV with them,<sup>18–20</sup> and have few rules regarding the time<sup>16,19,21,22</sup> and context<sup>19,23</sup> of children's TV viewing and when children have TVs in their bedrooms.<sup>17,21,22</sup> Although these data suggest that parenting practices are key influences on youth TV viewing, the studies are limited to Australian<sup>18,19,21</sup> and US<sup>16,17,22</sup> samples. Moreover, the majority of the studies have focused on parenting practices for 1 parent (usually the mother), rather than on the interplay between mothers' and fathers' parenting practices. Studies also have focused on practices specific to TV viewing, rather than broader sedentary parenting practices. Therefore, there is a need to examine whether maternal and paternal sedentary and screen-based parenting practices are associated with youth TV viewing in a European sample. In this study, we examined whether parenting styles and parenting practices were associated with the TV-viewing behaviors of a sample of 10- to 11-year-old youths from Bristol, United Kingdom.

## METHODS

Data are from the Bristol 3Ps Project, which examines the influences of peers and parents on physical activity and sedentary time among 10- to 11-year-old children. Sampling was performed on the basis of primary school

location and the 2007 Index of Multiple Deprivation (IMD) score for the school's postal code. The IMD is an area-level measure of deprivation, produced by the UK government, that includes income, health, educational status, and employment status.<sup>24</sup> The IMD scores of all state-funded schools within a 15-mile radius of the University of Bristol were obtained and divided into thirds, to provide tertiles of school IMD scores. Fifty schools were approached, and 40 schools agreed to participate. The final sample included 12 schools from the high-deprivation tertile, 16 from the middle-deprivation tertile, and 12 from the low-deprivation tertile. In total, 1684 year 6 children and 1 of their parents were invited to take part in the study, and 986 children and 539 parents provided data. Data are presented here for the 431 parent-child dyads that presented complete, self-reported, sedentary behavior data. This study was approved by a University of Bristol ethics committee, and informed parental consent was obtained for all participants.

TV viewing was assessed by using a single question that asked both parents and children to report the number of hours per day spent watching TV (0, <1, 1–2, 2–3, 3–4, 4–5, or >5 hours/day). The assessment of TV viewing with a single question has been shown to correlate ( $r = 0.60$ ) with 10 days of TV diaries for young children.<sup>25</sup> Parent and child TV viewing was categorized as <2, 2 to 4, or >4 hours/day, thereby providing an indication of the extent to which the participant met (<2 hours/day), exceeded (2–4 hours/day), or greatly exceeded (>4 hours/day) the AAP TV-viewing guideline.<sup>4</sup>

Child-perceived parental restriction of sedentary behaviors was assessed by using a modified version of the sedentary time restriction subscale of the Activity Support Scale.<sup>26</sup> The scale asks

children to report whether a parent limits TV time, video/computer game time, and computer time for nonhome-work activities and whether the parent tells the child to go outside after spending substantial time indoors. Questions adopt a 4-point response scale (strongly disagree to strongly agree). For the maternal questions, the children were asked to provide responses for the parent or stepparent with whom they spend the most time. The same information was then collected for fathers/male guardians, to provide both maternal and paternal sedentary restriction scores. In a test-retest study conducted with a 1-week interval with a subsample of 37 children from 1 Bristol primary school, we found that paternal ( $r = 0.684$ ;  $P < .001$ ) and maternal ( $r = 0.759$ ;  $P < .001$ ) scale scores were highly correlated. Paired-sample  $t$  tests also indicated that there was no evidence of a mean difference in the paternal or maternal scores recorded at time 1 and time 2 ( $P > .05$ ).

To minimize participant data collection burden, only maternal parenting style was assessed with the Children's Report of Parent Behavior Inventory, a 30-item, child-completed questionnaire.<sup>27,28</sup> Maternal parenting was classified as high or low control and high or low acceptance on the basis of established mean values.<sup>27,28</sup> Maternal parenting was classified as authoritative (high acceptance and high control), authoritarian (low acceptance and high control), permissive (high acceptance and low control), or uninvolved/neglectful (low acceptance and low control).<sup>27</sup> Because only 15 children (3.8%) classified their mothers' parenting as uninvolved/neglectful, these participants were removed from analyses. The test-retest study showed that time 1 and time 2 acceptance ( $r = 0.712$ ;  $P < .001$ ) and control ( $r = 0.754$ ;  $P < .001$ ) values were highly corre-

lated, with paired-sample  $t$  tests, which indicated that there was no evidence of a mean difference in the scores recorded at the 2 assessments ( $P > .05$ ).

Parents were asked to report whether they were working full-time, were working part-time, or were not currently working/were in a caregiver role. Parents also were asked to report the number of children in the house and the household postal code, which was used to obtain the home-associated IMD score.

Descriptive statistics were calculated for all variables. Child reports of maternal and paternal sedentary restriction scores were categorized as high (mean value or above) or low (below mean value) and were combined to create a family-level categorical indicator of sedentary restriction, reflecting whether both parents, 1 parent, or neither parent reported high restriction. Graphs, cross-tabulations, and  $\chi^2$  tests were used to examine whether child TV viewing differed according to maternal parenting style or combined parental restriction.

A multinomial logistic regression model with relative risk ratios (RRRs) was used to examine whether child TV viewing was predicted by parenting style (with authoritative as the reference group) or parental sedentary restriction (with high parental restriction from both parents as the reference group). Because we reported previously that high levels of parent TV viewing were associated with high levels of TV viewing among children,<sup>7</sup> the models were adjusted for parent TV viewing. Less than 2 hours of TV per day was the reference group for the model, which also was adjusted for maternal work patterns, the number of children in the household, child gender, and the home-associated IMD score. Robust SEs were used to account for the clustering of

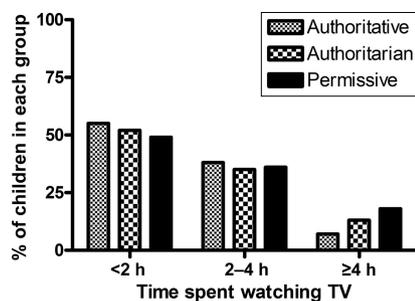
**TABLE 1** Descriptive Statistics

Maternal sedentary restriction score, mean $\pm$ SD	
Low (below mean) ( $n = 178$ )	2.19 $\pm$ 0.53
High (at least mean) ( $n = 218$ )	3.46 $\pm$ 0.38
Paternal sedentary restriction score, mean $\pm$ SD	
Low (below mean) ( $n = 204$ )	1.62 $\pm$ 0.36
High (at least mean) ( $n = 154$ )	2.59 $\pm$ 0.31
Consistent sedentary restriction, $n$ (%)	
Both parents high restriction	124 (35.63)
High/low restriction mixture	93 (26.72)
Both parents low restriction	131 (37.64)
Child TV viewing, $n$ (%)	
<2 h/d	230 (53.36)
2–4 h/d	157 (36.43)
>4 h/d	44 (10.21)
Parent TV viewing, $n$ (%)	
<2 h/d	214 (49.65)
2–4 h/d	188 (43.62)
>4 h/d	29 (6.73)
Parenting style, $n$ (%)	
Authoritative	214 (54.04)
Authoritarian	118 (29.80)
Permissive	49 (12.37)
Uninvolved/neglectful	15 (3.79)
Maternal work patterns, $n$ (%)	
Full-time	51 (12.41)
Part-time	273 (66.42)
Not working/caregiver	87 (21.17)
No. of children in home, $n$ (%)	
1	42 (9.88)
2	209 (49.18)
3	116 (27.29)
$\geq 4$	58 (13.65)

participants in schools in the calculation of  $P$  values and 95% confidence intervals (CIs). To test for any bias in the sample, follow-up  $\chi^2$  tests were used to examine whether there were any differences in child TV viewing, parental sedentary restriction, or parenting style between the participants who were included and those were excluded from the analyses because of missing data. Analyses were performed with Stata 10.0 (Stata Corp, College Station, TX), and  $\alpha$  was set at .05.

## RESULTS

A little more than one-half (53.4%) of the children watched <2 hours of TV per day, with a similar proportion of parents (49.7%) also meeting the AAP guideline (Table 1). A little more than



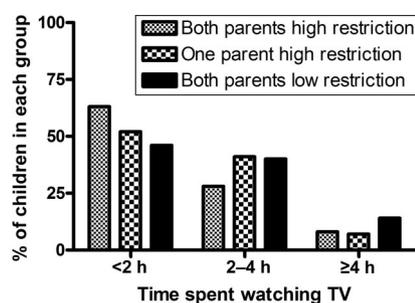
**FIGURE 1**

Child TV viewing according to parenting style.  $\chi^2 = 10.51$ ;  $P = .033$ .

one-half of the children reported that their mothers had an authoritative parenting style, and 35.6% of the children reported that both their mother and father were in the high sedentary restriction group.

Figure 1 presents the proportion of children in the 3 TV-viewing categories for each maternal parenting style group. Although the majority of children watched <2 hours/day, followed by 2 to 4 hours/day, across all parenting style groups, a greater proportion of children with permissive mothers watched >4 hours of TV per day, compared with children with authoritarian or authoritative mothers. A  $\chi^2$  test indicated that there was some evidence that this pattern was not a chance finding ( $P = .033$ ).

Figure 2 presents the proportion of children in each of the 3 TV-viewing categories according to parental sedentary restriction group. Compared with children from families in which 1 or



**FIGURE 2**

Child TV viewing according to parenting practices.

**TABLE 2** Multinomial Logistic Regression Model Predicting Child TV Viewing

	RRR (95% CI)	z	P
<b>2-4 h</b>			
Parental sedentary restriction (reference: both parents high restriction)			
One parent high restriction, 1 low restriction	1.88 (1.02-3.43)	2.04	.041
Both parents low restriction	2.16 (1.19-3.91)	2.56	.010
Parenting style (reference: authoritative)			
Authoritarian	1.14 (0.65-2.00)	0.45	.655
Permissive	1.72 (0.74-4.00)	1.26	.206
<b>&gt;4 h</b>			
Parental sedentary restriction (reference: both parents high restriction)			
One parent high restriction, 1 low restriction	1.28 (0.29-5.54)	0.22	.744
Both parents low restriction	3.27 (1.28-8.34)	2.49	.013
Parenting style (reference: authoritative)			
Authoritarian	1.86 (0.80-4.33)	1.44	.148
Permissive	5.24 (1.48-18.63)	2.56	.010

The reference group was that viewing <2 hours of TV per day. The model was adjusted for parent TV viewing, maternal work patterns, number of children in the home, child gender, and IMD for the home postal code.

neither parent demonstrated high restriction, a greater proportion of children for whom both parents demonstrated high restriction watched <2 hours of TV per day. Conversely, a greater proportion of children for whom both parents demonstrated low restriction of sedentary time watched >4 hours of TV per day. A  $\chi^2$  test indicated that there was some evidence that the difference in child TV viewing according to parental restriction categories was not a chance finding ( $P < .001$ ).

The results of the multinomial logistic regression model are presented in Table 2. Compared with children from high-restriction families (in which children reported that both parents demonstrated high restriction of sedentary time), the RRR for watching 2 to 4 hours (vs <2 hours) of TV per day was 2.2 times higher for children from low-restriction families (ie, both parents demonstrated low restriction; RRR: 2.16 [95% CI: 1.19-3.91];  $P = .010$ ). Similarly, compared with children from high-restriction families, the risk of watching >4 hours (vs <2 hours) of TV per day was 3.27 times higher for children from low-restriction families

(RRR: 3.27 [95% CI: 1.28-8.34];  $P = .013$ ). The same model also showed that the risk of watching >4 hours (vs <2 hours) of TV per day was 5.24 times higher for children with permissive mothers, compared with children with authoritative mothers (RRR: 5.24 [95% CI: 1.48-18.63];  $P = .010$ ). The model included both boys and girls, and there was no evidence of a gender effect ( $P > .05$ ). Follow-up  $\chi^2$  tests indicated that there were no statistically significant ( $P > .05$ ) differences in child TV viewing, parental sedentary restriction, or parenting style between the participants who were included and those who were excluded from the regression model because of missing data.

## DISCUSSION

This study has shown that, for a sample of 10- to 11-year-old children from the United Kingdom, parenting practices and parenting styles play important roles in predicting children's adherence to the AAP TV-viewing recommendations. Children were most likely to exceed TV-viewing recommendations when both parents reported low restriction of sedentary activities

and when children thought that their mothers exhibited a permissive parenting style. Moreover, results highlight the need to examine the degree to which children exceed recommendations. In this study, results differed in predictions of 2 to 4 hours of TV viewing and >4 hours of TV viewing among children, with stronger effects being noted for the latter. In particular, children from low-restriction families were twice as likely to watch 2 to 4 hours of TV and 3 times as likely to watch >4 hours (vs <2 hours) of TV per day, compared with children from high-restriction families. Similarly, children from permissive families were >5 times as likely to watch >4 hours (vs <2 hours) of TV per day, compared with children from authoritative families. Results from this study suggest that, to reduce children's TV viewing, both mothers and fathers should be encouraged to implement consistent strategies to restrict their child's sedentary behaviors. It is important to note that, although the current work focused on whether both parents restricted sedentary time, it did not examine the relative efficacy of different approaches for communicating restriction messages. Therefore, future work needs to focus on how best to deliver restriction messages and how to help parents negotiate the resistance that may occur when they attempt to implement restrictive practices.

The negative relationship between restriction of sedentary activities and children's TV viewing, with high restriction predicting lower TV viewing, contrasts with findings presented in the dietary literature.<sup>29</sup> A large body of research has shown that parents' restriction of children's access to specific foods is linked to greater consumption of those foods in the absence of parental control, increased prefer-

ence for the restricted foods, and higher subsequent weight status.<sup>29</sup> At first glance, these results seem contradictory. It is likely, however, that restriction leads to increased preference for the restricted object or activity in both situations but the opportunities to act on such preferences differ according to the situation. In the case of dietary patterns, parents have much less control over children's access to and consumption of restricted foods as the children grow older. In addition, children need to eat and are presented with multiple opportunities each day to select and to consume foods. In contrast, it is not essential that children watch TV, and the ability to control home access to sedentary activities does not change tremendously with age. Switching the TV off is developmentally appropriate for any age group.

In addition to parenting practices, permissive maternal parenting was associated with a higher risk of greatly exceeding the AAP guideline, compared with authoritative maternal parenting. The association between permissive parenting and a less-desirable health outcome is consistent with previous research that showed that children with permissive parents are less likely to eat fruits and vegetables<sup>9</sup> and are more likely to consume alcohol<sup>30,31</sup> and to participate in substance abuse.<sup>30</sup> As already noted, however, we and others reported recently that permissive parenting is associated with higher levels of children's physical activity.<sup>11,12</sup> Elucidating these inconsistencies is complex, but the different associations between parenting styles, physical activity, and TV viewing are consistent with the idea that TV viewing and the broader category of sedentary behaviors do not simply represent a lack of physical activity but are separate distinct behaviors.<sup>32</sup> Therefore, the key predictors of TV viewing and

physical activity may differ, which suggests that behavior-specific intervention strategies are likely to be needed.

To our knowledge, this is the first study that has examined the extent to which parenting styles and parenting practices are associated with children's TV viewing. We also controlled for parent TV viewing and key demographic factors that have been associated with children's TV viewing. One limitation is that the study was based on a cross-sectional sample drawn from a single UK city, which might limit our ability to generalize to other cities within the United Kingdom and to other countries. We also assessed only usual TV viewing and so cannot differentiate between weekdays and weekend days. The CIs for permissive parenting in the multinomial regression model were very wide; therefore, the importance of the permissive parenting finding should be interpreted with caution. We assessed only maternal parenting style and so cannot provide any information on whether or how paternal parenting style might have been associated with children's TV viewing. Moreover, because of the low frequency of responses, we had to remove the uninvolved/neglectful parents from the analyses, which prevented us from examining how the screen-viewing patterns of that group might have differed from those of the other 3 parenting style groups.

## CONCLUSIONS

In this study, we found that children who have 2 parents who restrict sedentary time are less likely to watch >4 hours of TV per day. We also showed that a permissive parenting style is associated with an increased risk of watching >4 hours of TV per day. Therefore, developing strategies to reduce permissive parenting in relation to sedentary behavior and helping

both parents to restrict their child's sedentary opportunities consistently could form part of efforts to reduce children's TV viewing. There is evidence to suggest that individuals who have strong theoretical and applied knowledge of developmental milestones and limitations are more likely to use authoritative parenting.<sup>33,34</sup> This suggests that knowledge of a child's limitations provides the necessary framework for parents to set and to enforce limitations for their child,

firmly but lovingly.<sup>35</sup> This might be achieved by adopting an authoritative parenting style, whereby parents try to build responsible decision-making in children by engaging them in the rationale and decision-making process. Therefore, clinicians and practitioners need to talk directly with parents about the need to place limitations on children's screen time and to promote media literacy by using established resources, such as the AAP Media Matters program.<sup>35</sup>

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## **Parental Sedentary Restriction, Maternal Parenting Style, and Television Viewing Among 10- to 11-Year-Olds**

Russell Jago, Kirsten K. Davison, Janice L. Thompson, Angie S. Page, Rowan Brockman and Kenneth R. Fox

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