

## **WHAT WE WATCH IS WHAT WE EAT?**

### **Evaluating the connection between television consumption and the eating behaviour of preschool-aged children**

**Tímea Tina Kásler**

tina.toth@yahoo.com

**DOI: 10.20520/JEL-KEP.2020.1.53**

#### **Abstract**

The media plays an important role in our everyday lives, including the lives of preschool-aged children. Simultaneously, television is an important factor that influences both children's food choices and eating customs, leading to an increase in childhood obesity rates. In order to analyse what relationship watching television has with the eating behaviours of preschool-aged children, Wardle et al.'s (2001) 35-item Children's Eating Behaviour Questionnaire, along with questions regarding the children's media usage, was administered to parents of children aged 3–7. The resulting sample of size N=365 was analysed via a one-way ANOVA, and the findings show that certain eating behaviours are linked to television consumption. These findings are important in relation to the growing evidence that child obesity is strongly linked with the television viewing habits of pre-school aged children (Twarog 2015).

#### **Keywords**

media, television consumption, eating behaviour, children, pre-school aged children

## **AMIT NÉZÜNK, AZT ESSZÜK?**

### **Az óvodáskorú gyermekek televíziózása és étkezési viselkedése közötti összefüggés vizsgálata**

**Kásler Tina Tímea**

#### **Absztrakt**

A média egyre fontosabb szerepet játszik az életünkben, melyből már az óvodáskorú gyermekeket sem zárhatjuk ki. Ezzel egyidejűleg a televízió fontos tényező, amely befolyásolja a gyermekek étel választását, de befolyásolja az étkezési szokásokat is, ami a gyermekkori elhízás arányának növekedéséhez vezet. Annak érdekében, hogy elemezzük: a televíziózás milyen összefüggésben van az óvodáskorú gyermekek étkezési szokásaival, Wardle et al. (2001) Children's Eating Behaviour kérdőívét vizsgálták 3-7 éves gyermekek szüleivel. Az N=365-es mintát egy-utas ANOVA táblák alapján elemeztük. Az eredmények kimutatták, hogy bizonyos táplálkozási szokások kapcsolódnak a televíziós fogyasztáshoz. Ezek az eredmények különösen fontosak, hisz egyre több kutatás alátámasztja, hogy az óvodáskorú gyermekek elhízása nagymértékben összefügg a televíziós fogyasztással (Twarog 2015).

#### **Kulcsszavak**

média, televízió fogyasztás, étkezési viselkedés, gyerekek, óvodáskorú gyermekek

# WHAT WE WATCH IS WHAT WE EAT?<sup>1</sup>

## Evaluating the connection between television consumption and the eating behaviour of preschool-aged children

*Tímea Tina Kásler*

### Introduction

The influence of the media does not stop at advertising. The questions regarding the relationship between the media and the audience have therefore shifted from whether mass communication tools affect consumers to how media content can influence people's thinking and behaviour (Tóth 2018). In recent years, television has been linked to alterations in children's eating behaviours (Hertzler and Frary 1999) and obesity (Crespo et al. 2001; Francis and Birch 2006; Proctor et al. 2003; Ouwens et al. 2012; Cox et al. 2012; Twarog 2015). Regardless of the growth in online marketing, television is still the primary medium used for advertising food and drink products to children (Landon 2013; Whalen et al. 2017). In 2016, over 20.300 food, beverage, and restaurant companies spent approximately \$13.5 billion on advertising in all media. In the US, children see an average of 10-11 such television advertisements per day or approximately 4000 advertisements per year (Rudd Center 2017). This same problem is also increasingly prevalent in Hungary. According to Hofmeister-Tóth (2016), although health is the most important value to Hungarians, in terms of achievement, it is ranked only 14th within the general population. Thus, healthy eating and food shopping is not a significant factor for Hungarians, although a small segment of the population is health conscious and seeks healthy nutritional characteristics (Dörnyei et al. 2014). As a matter of fact, 19% of Hungarian children aged 8–12 visit fast-food chains at least once a month (Neulinger 2015).

Children focus their attention naturally on persuasive techniques, as well as visual effects such as animation. Emotional appeals distract children from other aspects of adverts such as, for example, nutritional disclaimers or product information (Wicks et al. 2009). However, past research, such as that done by Oates et al. (2002), has shown that preschool children do not understand the persuasive intent of an advertisement, thus they are more vulnerable to advertisements than older children. An analysis of screen time among children aged 2–6 years found that the majority of studies reported a significant association between television viewing and adverse dietary outcomes. Aside from measuring exposure, little is known about the eating behaviours linked to screen time amongst young children. Many eating behaviours emerge prior to school admission, suggesting a need to support caregivers in establishing healthy eating habits (Blaine et al. 2016).

---

<sup>1</sup> The manuscript was proofread and edited by Cambridge Proofreading & Editing Services LLC.

## Literature review

As discussed previously, children are exposed to a wide range of advertising through the media. Thus, it is vital to grasp the ways in which children process the various content they are exposed to through the media on a daily basis in order to understand how such exposure might affect their eating practices. Buijzen, Van Reijmersdal and Owen (2010) studied the way young people process commercialized media content and created the Processing of Commercial Media Content (PCMC) model. In their model, they highlight three levels of persuasion processing: the systematic, heuristic, and automatic levels. The authors state that each level may lead to attitude formation, which affects consumer behaviour. However, in early childhood, children lack the necessary information-processing skills and market-related experience to process a persuasive message. Thus, systematic and heuristic processing are less likely; therefore, children are influenced more by the automatic process. The paper then takes the model further by connecting it to the limited capacity model of mediated message processing (LCMP) introduced by Lang (2000) by comparing the possible ratios between resources allocated (RA) and the resources required (RR) by the message (Buijzen, Van Reijmersdal and Owen 2010). However, Rozendaal et al. (2011) argue that due to the affect-based nature of contemporary advertising, children process advertising mainly under conditions of low elaboration and are therefore not likely to use their advertising knowledge as a critical defence. Literature on cognitive development also claims that children's ability to use advertising knowledge as a defence is limited by their undeveloped executive functioning and emotional regulation skills. Hence, two dimensions need to be taken into account: advertising literacy performance, which takes into account the actual use of conceptual advertising knowledge, and attitudinal advertising literacy, which includes low-effort, attitudinal mechanisms that can function as a defence under conditions of low elaboration (Rozendaal et al. 2011).

To explore how advertisements further affect children, theories of cognitive development that address age-based differences in children's understanding of commercial content must also be mentioned. A pioneer in this field, Piaget, developed a theory of cognitive development (Piaget 1970) that explains observed patterns of behaviour. The theory proposes that children's development can be defined in four stages. According to Piaget (1970), the period from 3 to 7 years of age represents the so-called "preoperational stage". At this stage, children use words and movements to represent reality; however, the representations are rather egocentric, as children in this age group cannot distinguish the points of view of others from their own (McAlister and Cornwell 2010). Interestingly, Piaget's (1970) cognitive theory also states, that children younger than 7 years are incapable of thinking about abstractions, such as symbols, making it difficult for them to make associations with brands and logos. Commercials targeting children are designed to attract and hold children's attention using lively action, sound effects and music. Audio features are particularly important in gaining children's attention, as they have more recruiting power than visual features, i.e., interesting sounds attract children who are not looking at the television. These findings are consistent with Piaget's insight that young children are especially focused on the attention-getting perceptual qualities of presentations (Calvert 2008).

Within the eating behaviours of children associated with television consumption, snacking has been a widely discussed issue. One of the first studies in this field was conducted by Gorn and Goldberg (1982). One group of preschool-aged children were exposed to 2 weeks of daily televised food and beverage messages at a summer camp, while the second group was not; this exposure eventually altered the children's afternoon snack choices. Children who viewed candy commercials picked significantly more candy over fruit.

Removing the candy commercials encouraged the selection of fruit, as did exposing the children to fruit commercials or nutritional public service announcements (Gorn and Gold-

berg 1982). With regards to snacking, Anderson and Anderson (2010) found that, in general, non-nutritious foods are as common as nutritious foods, while the consumption of non-nutritious food is usually reinforced. A study by Bower and Sandall (2002) showed that 7- to 8-year-old children exhibited an overall preference for sweets and chocolate over fruit and snacks containing cereal. Taste was the main reason given for snack choices, usually in spite of other snacks being associated with healthy images. Choice was also dependent on parental influence and availability (Bower and Sandall 2002). In addition, snacking is more common than proper meals, and eating is often shown to be rushed (Anderson and Anderson 2010).

While Francis and Birch (2006) found that television viewing may either increase or reduce children's intake, depending on prior experiences with eating during television viewing. This finding suggests the possibility that children who are given opportunities to eat while watching television may become less sensitive to internal cues of satiety. Television viewing reduced energy intake during meals and snacks for some children; however, others who were accustomed to eating during television viewing increased their food intake (Francis and Birch 2006). In addition, Ouwens, Cebolla and Van Strien (2012) found that television viewing was positively associated with snacking, external eating and emotional eating, but it was not associated with BMI (eating in response to negative emotions). Furthermore, emotional eating significantly moderated the relation between television viewing and snacking, whereas dietary restraint and external eating did not (Ouwens, Cebolla and Van Strien 2012). The results suggest that children show a biological reaction to emotional stressors by not eating when in distress and that emotional overeating is a developed response that television viewing could strengthen. Furthermore, a recent study found that although the effect sizes were small, watching television during meals was associated with an unhealthier intake of some food groups, such as sugar-sweetened beverages and chips, while fruit consumption decreased (Trofholz 2019).

The reason why snacking is so immensely analysed within this field is that an increased amount of snacking can lead to obesity, which is probably the most researched topic within this specific field. Longitudinal research has determined that there is a direct relationship between the time spent watching television and obesity. Furthermore, every additional hour spent watching television increased obesity by 2% (Gortmaker et al. 1996; Crespo et al. 2001; Proctor et al. 2003; Cox et al. 2012; Twarog 2015). In addition, Halford et al. (2007) found that exposure to food advertising increased food intake in all children. This finding was later replicated in 5- to 7-year-old children (Halford et al. 2007). Interestingly, a further study demonstrated that this increase in intake was largest amongst obese children (Halford et al. 2008). However, other studies have tried to find links between healthy eating habits and watching television. For example, FitzPatrick et al. (2007) tested the independent associations of eating dinner as a family and having the television on during dinner with child feeding behaviours. A family eating dinner together was positively associated with serving fruits or vegetables; these servings decreased with each night the television was on during dinner (FitzPatrick et al. 2007). Additionally, watching television has been found to decrease children's awareness of food consumption (often resulting in greater food intake) and encourage the development of non-hungry eating habits (Francis and Birch 2006).

At the same time, unhealthy eating can be linked to viewing television in general, as several studies involving children have shown that children who were exposed to advertised foods were more likely to choose and consume those foods compared to children who were not exposed to those advertisements (Halford et al. 2007). In order to examine whether televised food commercials influence preschool children's food preferences, two groups of children were exposed to the same videotape, but one group watched the videotape with embedded commercials, whereas the other group did not. The children who watched the embedded commercials were significantly more likely to choose the advertised items than the children

who did not see the commercials (Borzekowski and Robinson 2001). In their paper, Marshall et al. (2007) examined children's experiences with, and influences regarding, foods high in fat, salt and sugar. The survey, which was conducted in New Zealand, claimed that food advertisements represented one-third of the favourite advertisements mentioned by children in a survey. Most of the named advertisements were for confectionary items, fast foods and drinks. Additionally, Glast and White (1976) found that the items the children requested the most were cereals and candies and that these were the items most frequently advertised. A similar study by Akas (2006) revealed that 89.6% of children either drank or ate something while watching television and that the foods they consumed most while watching television were fruits, soft drinks, popcorn/nuts, cake, chips and candy/chocolate. The results also revealed that 40.3% of the children asked their parents to purchase the goods that they saw in television advertisements and that 8.9% of them argued with their parents in order to convince them to buy that particular product. Children also tended to request more sweetened products such as candy, ice cream, biscuits, cakes and soft drinks. The food content and messages depicted in popular children's picture books were also examined. These results were then compared with findings in the literature on food messages presented in children's television programs. The ratio of healthy foods to nutrient-poor foods was higher in the books. However, as in television, the books emphasized the desirability of sweetened foods (Goldman and Descartes 2016).

The role of parents and mealtime has also been researched with regards to the eating behaviours of preschool-aged children. Bowman and Harris (2003), for example, compared the dietary choices and television-viewing statuses of preschool-aged children living in single-parent and two-parent households. They found that children in single-parent households watched more television and ate unhealthier food. A study by Wenholt and Harrison (2016) looked into the quality of family mealtimes, focusing specifically on mealtime harmony, mealtime ritualization and children's food intake. The study found that watching television during family meals was a significant predictor of less mealtime ritualization, with the children also tending to eat fewer fruits and vegetables. However, mealtime harmony did not decrease. Another study found that children of migrants and parents with low educational levels had more body fat, ate more meals and snacks while watching television and ingested more fruit and fatty foods compared with their respective counterparts. Migrant was defined as at least one parent born out of Switzerland while low educational level was as at least one parent with no education beyond obligatory school. Children of parents with low educational levels also consumed less water and fewer vegetables than their counterparts (Ebenegger et al. 2011). In 2011 and 2013, children who had parents with no formal or only primary school educations displayed significantly higher consumption rates for soft drinks containing sugar and potato chips and other salty snacks and significantly lower consumption rates for fresh fruit, vegetables and cheese (Pérez et al. 2017). It was also found that parental television role modelling had long-term effects on children's weight statuses in adulthood. Frequent television viewing on the part of the parents increased the children's weight statuses through two distinct pathways: via weight status in young adulthood and via educational attainment and adult television viewing habits (Notten, Kraaykamp and Tolsma 2013). Finally, children who spent more than 2 hours per day in front of the television were more likely to live in large urban areas, to have mothers with low educational levels, and to be overweight compared to children who watched television less than 2 hours per day. Moreover, it was observed that the television viewing times of participants' mothers and fathers were longer among children whose television viewing times were greater than or equal to 2 hours per day compared to those with television viewing times of less than 2 hours a day (Manios 2009). Furthermore, a recent study suggested that the combination of parental influence and television consumption increases the chance of picky eating. The study by Cole et al. (2018) found that a higher sense

of positive climate during family meals and mealtime ritualization were associated with lower odds of fussy eating behavior one year later. The paper suggested that the home feeding environment plays a role in the development of young children's fussy eating behavior. Avoiding the television and maintaining parental control of food choices during mealtimes could lead to improvements in children's food preferences and dietary intake (Cole et al. 2018).

This paper uses the Child Eating Behaviour Questionnaire developed by Wardle et al. (2001) to assess eight dimensions of a child's eating style: responsiveness to food, enjoyment of food, satiety responsiveness, slowness in eating, fussiness, emotional overeating, emotional undereating, and desire to drink (Wardle et al. 2001). Several studies have incorporated this instrument or parts of it. For example, it was used in the study by Ainuki and Rie (2011), which aimed to explore associations between children's appetites and maternal feeding practices. Children's appetite patterns were associated with parental feeding practices, particularly their snacking behaviour. Mothers with "both low enjoyment of, and responsiveness to, food" children were more likely to use pressure to encourage the children to eat than were mothers of children in the other groups. Mothers with children in the "both high" group were more likely to employ instrumental feeding. Mothers with "high enjoyment of food and low food responsiveness" children were more likely to feed snacks once per day; on the other hand, mothers with "both high" children were more likely to feed snacks more than twice per day. Mothers with "both low" children were less likely to have an established snack time (Ainuki and Rie 2011). Another study explored associations between a child's eating behaviours and maternal feeding practices by specifically testing the hypotheses that maternal "restriction" is associated with having a child with stronger food-approach tendencies (e.g., over-responsiveness to food), and maternal pressure to eat is associated with having a child with food-avoidant tendencies (e.g., satiety responsiveness). Children who were more food responsive had mothers who were more likely to restrict their intake of unhealthy foods. Children who enjoyed food less, were fussier, or ate more slowly had mothers who were more likely to use pressure strategies (Webber et al. 2010). Apart from these studies, several other papers have incorporated the Child Eating Behaviour Questionnaire, usually in connection with measuring obesity, BMI, differences between siblings in terms of eating behaviour and maternal feeding practices (Carnell and Wardle 2007; Viana et al. 2008; Farro et al. 2009; Rodgers et al. 2013; Blissett et al. 2010). Finally, the desire to drink has also been tested using the Child Eating Behaviour Questionnaire, but these tests have been done mostly in relation to soft drink consumption (Sweetman et al. 2008).

The present study aims to analyse the relationship between eating behaviour and television consumption among preschool-aged children. Past theoretical frameworks suggest that increased television consumption does, in fact, have an effect on the eating styles of children between the ages of 3 and 7. However, past research has focused only on one eating behaviour at a time, such as eating pace or food selection, while the purpose of this study is to evaluate what types of eating behaviours are altered by television consumption. Based on existing work, it is hypothesized, that the level of television consumption effects the eating behaviour of preschool-aged children.

## Methodology

Wardle et al.'s (2001) Children's Eating Behaviour Questionnaire is a 35-item instrument with eight scales, and the primary aim of the questionnaire is to analyse the differences in eating styles of children. The questionnaire consists of the following scales: 1) food fussiness, which is defined as the refusal of a considerable amount of familiar foods as well as non-familiar foods; 2) emotional overeating and 3) emotional undereating, which are considered to be an

increase and a decrease in food intake, respectively, due to a variety of negative emotions; 4) food responsiveness and 5) enjoyment of food, which stand in for food intake in response to environmental food cues; 6) desire to drink mirrors the longing of children to drink; 7) satiety responsiveness represents the capability of a child to reduce food intake after eating in order to control their energy intake; and 8) slowness in eating, which is characterised by a decrease in eating rate due to the lack of satisfaction and interest in food. Principal Component Analyses showed that each scale had a single factor that explained 50–84% of the variance, while an overall factor analysis verified the hypothesized scales (Wardle et al. 2001).

The Children's Eating Behaviour Questionnaire was used as the first section of the survey designed for the current study. The questionnaire was translated into Hungarian and then back into English to make sure that the translation was accurate. In the full survey, it was followed by general questions regarding the children's media consumption and possible food allergies as well as demographic questions regarding the children and their parents. Prior to the online survey, a pilot version of the survey was tested, and questions were altered when necessary to improve clarity. The survey was conducted online in 2016 with parents whose children were between 3 and 7 years old. The sample of size  $N=365$  was then analysed via SPSS. A one-way ANOVA was used to investigate the relationship between children's eating behaviour and their television consumption. In particular, the results from the 35-item Children's Eating Behaviour Questionnaire were tested against daily television consumption.

## Findings

### *Sample*

The sample consisted of 365 parents of preschool-aged children between 3 and 7 years old. Regarding the socio-demographic characteristics of the children and their mothers, 190 respondents lived in or around the capital of Hungary. Apart from the 35-item Children's Eating Behaviour Questionnaire, the survey included numerous questions regarding the children's media consumption habits as well as any form of possible allergies or illnesses the children might have regarding their daily food consumption. The most common food allergy was lactose intolerance, which affected 6.8% of the children in the sample. The average television viewing time for the children was "between 1-2 hours" daily.

### *One-way ANOVA analysis*

The sample was analysed using a one-way ANOVA to investigate the relationship between the children's eating behaviour and their television consumption. For the reliability test, Cronbach's alpha was used to assess the internal consistency with alpha. Five of the subscales, i.e., emotional overeating, satiety responsiveness, slowness in eating, emotional undereating and food fussiness, produced Cronbach's alphas under 0.7. According to the most widely accepted evaluation of alpha, this value should be above 0.7 but not much higher than 0.9 (Nunnally 1978). Hence, one item was removed from the 'emotional overeating', 'satiety responsiveness' and 'emotional undereating' subscales, while two items were removed from 'slowness in eating', and three items were removed from 'food fussiness'. The other three subscales consist of the same items used by Wardle et al. (2001). See Cronbach's alpha values and item statistics in Table 1.

Table 1.  
*Cronbach's alpha of subscales*

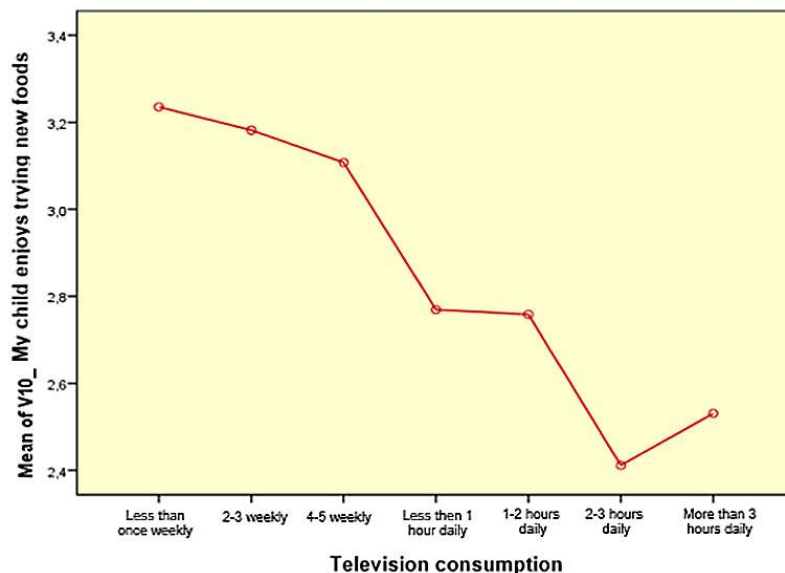
Sub-scale of CEBQ	Cronbach alpha	Mean	Std. Deviation
Food responsiveness	0,811	2,108	0,903
Emotional overeating	0,766	1,567	0,654
Enjoyment of food	0,828	3,375	0,799
Desire to drink	0,797	2,597	0,903
Satiety responsiveness	0,553	3,16	0,51
Slowness in eating	0,704	2,681	0,559
Emotional undereating	0,705	2,65	0,853
<b>Food fussiness</b>	<b>0,864</b>	<b>2,945</b>	<b>0,36</b>

Source: Own construction using SPSS

From the items tested, only the six significant results are displayed below for further discussion. The first item selected for further discussion compares the 10th item of the Children's Eating Behaviour Questionnaire with the amount of television consumed (see Figure 1). The Chi-square value is 20.76, while the p-value for  $F(6,323) = 2.98$  is  $p = 0.006$ . A negative relationship can be seen; thus, an increase in television consumption leads to a decrease in the willingness to try new types of foods.

Figure 1.

*Relationship between enjoyment of new foods and television consumption*



Source: Own construction using SPSS

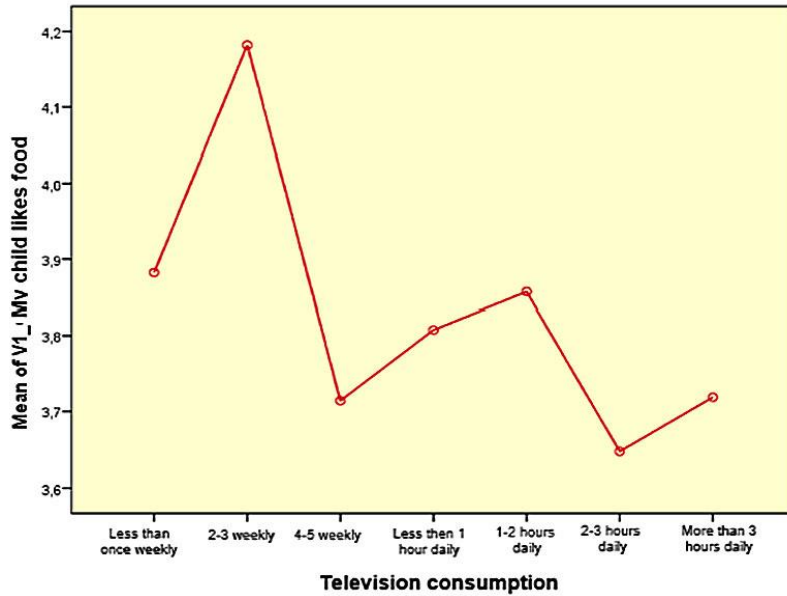
The second item selected for further analysis has a Chi-square of 6.69 and a level of significance for  $F(6,323) = 1.42$  of  $p = 0.062$  (see Figure 2). It compares the first item of the Children's Eating Behaviour Questionnaire with the amount of television consumed. Here, a nega-



tive relationship can also be seen, which leads to the assumption that an increase in television consumption can be partially responsible for a child disliking certain types of food.

Figure 2.

*Relationship between liking foods and television consumption*

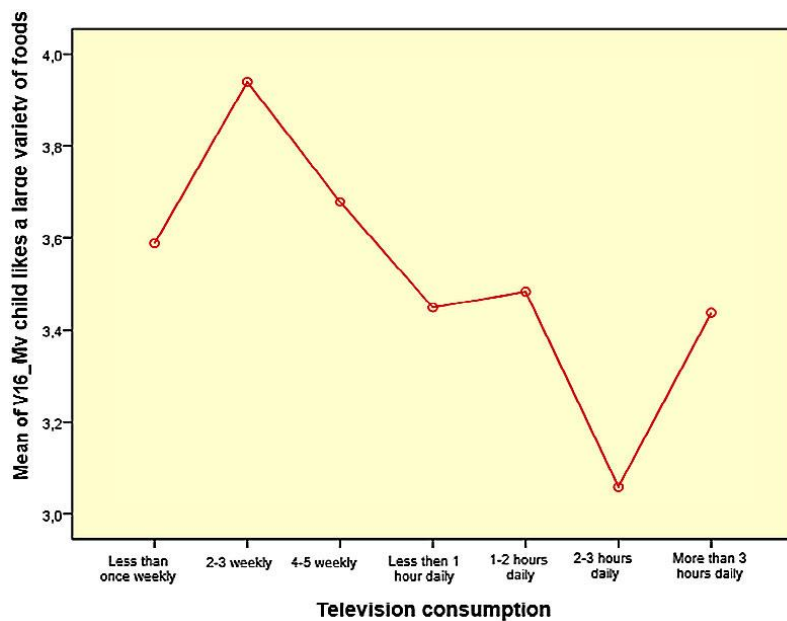


Source: Own construction using SPSS

The sixteenth item on the Children’s Eating Behaviour Questionnaire was also selected for further analysis, as the results are significant with  $F(6,323) = 2.4$ ,  $p = 0.033$  (see Figure 3) and a Chi-square of 17.432. Comparing this item with the amount of television consumed shows a negative relationship, meaning that an increase in television consumption narrows a child’s food intake variety.

Figure 3.

*Relationship between liking a variety of foods and television consumption*

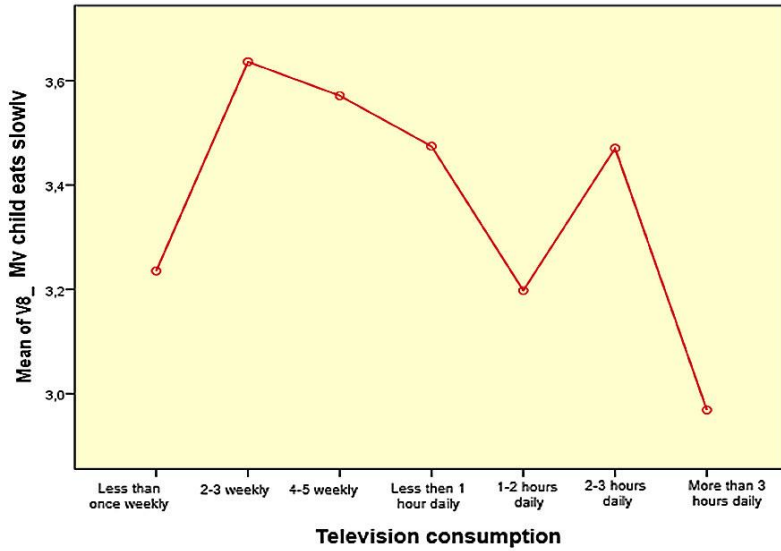


Source: Own construction using SPSS

Comparing the eighth item of the Children’s Eating Behaviour Questionnaire with the amount of television consumed also lead to a significant result, with  $F(6,323) = 2.14$ ,  $p = 0.049$  (see Figure 4) and a Chi-square of 17.43. Therefore, an increase in television consumption results in children eating less slowly.

Figure 4.

*Relationship between eating slowly and television consumption.*

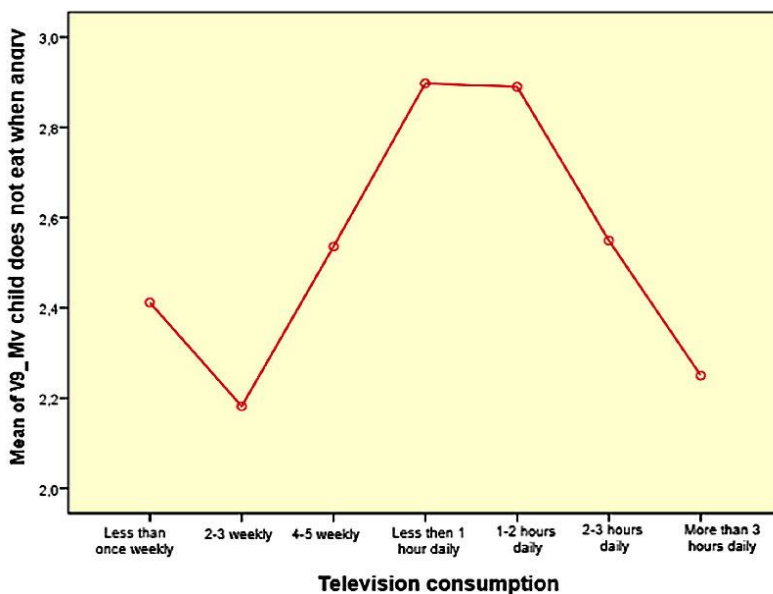


*Source: Own construction using SPSS*

The results of comparing the ninth item of the Children’s Eating Behaviour Questionnaire with the amount of television consumed were also significant, with  $F(6,323) = 2.56$ ,  $p = 0.016$  (see Figure 5) and a Chi-square of 24.23. Interestingly children whose television consumption is low (less than the daily average consumption) showed a positive relationship between consumption and food intake when angry. Meanwhile, children with a high television consumption showed a negative relationship between consumption and food intake when angry.

Figure 5.

*Relationship between not eating when angry and television consumption.*

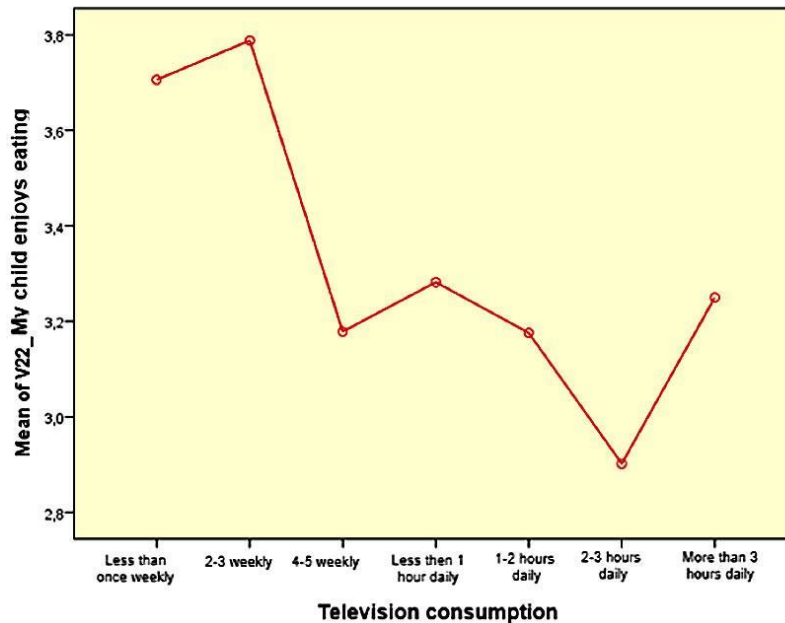


*Source: Own construction using SPSS*

Finally, the twenty-second item on the Children’s Eating Behaviour Questionnaire was chosen for further analysis (see Figure 6). The results were also significant, with  $F(6,323) = 3.29$ ,  $p = 0.002$  and a Chi-square of 19.98. Generally, the results showed that a decrease in the enjoyment in food consumption can be witnessed as television consumption increases.

Figure 6.

*Relationship enjoyment of eating and television consumption.*



Source: Own construction using SPSS

## Discussion

Increased emotional eating is linked to an increase in television consumption, which is in line with the findings of Ouwens et al. (2012), who found that television viewing was positively associated with emotional eating. The findings also reveal that an increase in television consumption leads to an increase in the pace of food intake of children. While the link between eating speed and television consumption in preschool-aged children has not been examined thus far, eating at a fast pace has been linked to obesity by Jahnke and Warschburger (2008).

Furthermore, an increase in television consumption influences the way children dislike certain types of foods and also narrows a child’s food intake variety. These results can be linked to the findings of Borzekowski and Robinson (2001) as well as Glast and White (1976), who found that children were significantly more likely to choose advertised items and that these items were mostly cereals and candies, which are most frequently advertised. Thus, the findings that children who have high television consumption dislike more types of food and are willing to eat a smaller variety may well be linked to the food advertisements they are exposed to while watching television. These results, on the other hand, underline the theory of Buijzen, Van Reijmersdal and Owen (2010) that children are influenced more by automatic processes, where advertising exposure may lead to attitude changes without explicit attention to, or awareness of, the persuasive communication. An increase in television consumption led to a decrease in the enjoyment of food, a topic which was previously studied by Harris and Bargh (2009). Their study found that television viewing in childhood is linked to greater perceived taste for, and enjoyment in, advertised unhealthy foods. However, the current paper focuses on the overall enjoyment of foods and television exposure; thus, it can be argued generally

that children with television exposure who often consume their meals watching television, which prohibits them from enjoying their food to the fullest, are multitasking whilst eating.

Ford et al. (2012) reported that there is a significant relationship between television viewing time and adverse dietary outcomes. Lower fruit and/or vegetable intake was the most frequently reported dietary outcome, followed by increased energy intake, from increased television viewing, suggesting that children whose television consumption is higher eat more junk food and are more likely to enjoy food consumption overall. Interestingly, other areas tested within the current survey, such as drinking habits, were not affected by television consumption. Finally, an increase in television consumption also led to a decrease in the willingness to try new food. It can be argued that findings related to the impact of commercials, such as in the study of Borzekowski and Robinson (2001), where children who were exposed to commercials were significantly more likely to choose the advertised items, can be used to explain the results of this study.

## Conclusions

The findings indicate that television indeed affects preschool-aged children as consumers and in terms of their behaviour. According to the results above, television consumption influences numerous eating behaviours such as the pace of food intake, the enjoyment of food, emotional eating as well as the willingness to try new foods.

Healthcare professionals should increase the awareness of certain techniques parents can use to improve their children's food habits and reduce their energy intake. It is essential to educate the parents of the children not only by showing them the possible negative consequences of certain eating habits but also what a healthy diet should consist of and what healthy eating behaviours are ideally. Moreover, preschool-aged children's television viewing habits are just as complex as those of any other consumer. The viewing habits of these children need to be examined more holistically. Furthermore, it is important to recognize from the marketing point of view what the decisive features are of the individual generations, as their behaviour can then be predicted and give companies a significant competitive advantage (Bereczki and Csordás 2016). Recommendations must also consider children's exposure to television food advertising and food-related television viewing behaviours (Cox et al. 2013). It is the responsibility of the public health policy makers to take specific measures to ensure that food advertisements during children's TV programs promote healthy food choices. An example of the current situation is summarized in the study of Song, Halvorsen and Harley (2014). Their study found that nutritionally speaking, child-targeted cereals are less nutritious overall than adult-targeted cereals and have higher rankings of sugar sources in the ingredients (Song, Halvorsen and Harley 2014). Thus, advertisements and the products advertised on children's television channels need to be regulated. A further argument for stricter policies lies in the fact that children's brand loyalties have already started to evolve at this extremely young age, thus affecting their entire lives, as the media can persuade children that unhealthy foods are their favourite brands.

To deepen the understanding of the differences in the eating behaviours of preschool-aged children, this study could be combined with a study on the full media consumption of these children, as advertisers today use new media technologies, such as branded websites, brand placement in application games and social media, widely (Buijzen, Van Reijmersdal and Owen 2010). These new practices are vastly different from traditional advertising and deserve attention, even in the preschool age range. Furthermore, this type of study could focus on possible gender differences in eating habits. Additionally, the link between different parenting styles and eating behaviours could also be analysed further by extending this study.

This avenue was indicated by the literature but still offers room for further analysis. The possible links between any possible food allergies and other intolerances and eating behaviour could be explored further as well. Finally, the current study's results could be validated further with numerous types of qualitative studies such as observations and in-depth interviews with parents as well as children.

Unfortunately, this paper is not without limitations. The sample was rather unbalanced regarding the regional heritage of the respondents. More than half of the results (55.6%) are from the central region of Hungary (including the capital, Budapest). Up to this point, eating habits have hardly been studied in smaller suburbs and villages; thus, a greater proportion of results from these areas could have provided interesting insights into this specific field. Furthermore, as the previous research, for example, Ainuki and Rie (2011), mentioned, several other factors besides television consumption, such as the influence of parents, mealtime, parental financial and educational backgrounds and even cultural aspects play a role in the eating behaviours of children. Cultural aspects can include parental and sibling influences as well as other types of media consumed, such as advergames, which are very popular amongst children these days. All in all, this is the first study focusing specifically on this age group in regards to exploring the connection between television consumption and eating behaviour. The current paper offers exciting findings, yet it would be interesting for future researches to thoroughly investigate underlying causes related to the relationships found.

## REFERENCES

- Ainuki Tomomi, Rie Akamatsu (2011) Association between children's appetite patterns and maternal feeding practices. *Food and Nutrition Sciences*, 2(3), 228.  
<https://doi.org/10.4236/fns.2011.23032>
- Anderson Leslie Margaret, Anderson Jim (2010) Barney and breakfast: messages about food and eating in preschool television shows and how they may impact the development of eating behaviours in children. *Early Child Development and Care*, 180(10). 1323–1336.  
<https://doi.org/10.1080/03004430903040516>
- Aktas Arnas Yasare (2006) The effects of television food advertisement on children's food purchasing requests. *Pediatrics International*, 48(2). 138–145.  
<https://doi.org/10.1111/j.1442-200X.2006.02180.x>
- Bereczki Nóra, Csordás Tamás (2016) Generációk a marketingben, A hazai Jones-generáció és jelenléte reklámfilmekben. *Jel-Kép*, 2016/4. 50–65.  
<https://doi.org/10.20520/JEL-KEP.2016.4.51>
- Blaine Rachel E., Fisher Jennifer Orlet, Blake Christine E., Orloski Alexandria, Younginer Nicholas, Bruton Yasmine, Ganter Claudia, Rimm Eric B., Geller Alan C., Davison Kirsten K. (2016) Conditioned to eat while watching television? Low-income caregivers' perspectives on the role of snacking and television viewing among pre-schoolers. *Public health nutrition*, 19(9), 1598–1605.  
<https://doi.org/10.1017/S136898001500364X>
- Blissett Jackie, Haycraft Emma, Farrow Claire (2010) Inducing preschool children's emotional eating: relations with parental feeding practices. *The American Journal of Clinical Nutrition*, 92 (2), 359–365. <https://doi.org/10.3945/ajcn.2010.29375>

- Borzekowski Dina L. G., Robinson Thomas N. (2001) The 30-second effect: an experiment revealing the impact of television commercials on food preferences of preschoolers. *Journal of the American Dietetic Association*, 101(1), 42–46.  
[https://doi.org/10.1016/S0002-8223\(01\)00012-8](https://doi.org/10.1016/S0002-8223(01)00012-8)
- Bower John A., Sandall Louise (2002) Children as consumers—snacking behaviour in primary school children. *International Journal of Consumer Studies*, 26(1), 15–26.  
<https://doi.org/10.1046/j.1470-6431.2002.00220.x>
- Bowman Shanthy A., Harris Ellen W. (2003) Food security, dietary choices, and television-viewing status of preschool-aged children living in single-parent or two-parent households. *Family Economics and Nutrition Review*, 15(2), 29.
- Buijzen Moniek, Van Reijmersdal Eva A., Owen Laura H. (2010) Introducing the PCMC model: An investigative framework for young people's processing of commercialized media content. *Communication Theory*, 20(4), 427–450.  
<https://doi.org/10.1111/j.1468-2885.2010.01370.x>
- Calvert L. Sandra (2008) Children as consumers: Advertising and marketing. *The future of children*, 18(1), 205–234. <https://doi.org/10.1353/foc.0.0001>
- Carnell Susan, Wardle Jane (2007) Measuring behavioural susceptibility to obesity: validation of the child eating behaviour questionnaire. *Appetite*, 48(1), 104–113.  
<https://doi.org/10.1016/j.appet.2006.07.075>
- Cole Natasha Chong, MUSAAD M. SALMA, Lee Soo-Yeun, Donovan M. Sharon (2018) Home feeding environment and picky eating behavior in preschool-aged children: A prospective analysis. *Eating behaviors*, 30, 76–82.  
<https://doi.org/10.1016/j.eatbeh.2018.06.003>
- Cox Rachael, Skouteris Helen, Rutherford Leonie, Fuller-Tyszkiewicz Matthew, Dell'Aquila Daniela, Hardy Louise L. (2012) Television viewing, television content, food intake, physical activity and body mass index: a cross-sectional study of preschool children aged 2–6 years. *Health Promotion Journal of Australia*, 23(1), 58–62.  
<https://doi.org/10.1071/HE12058>
- Cox Rachael, Skouteris Helen, Dell'Aquila Daniela, Hardy Lousie L., Rutherford Leonie (2013) Television viewing behaviour among pre-schoolers: Implications for public health recommendations. *Journal of Pediatrics and Child Health*, 49(2), 108–111.  
<https://doi.org/10.1111/jpc.12041>
- Crespo Carlos J., Smit Ellen, Troiano Richard P., Bartlett Susan J., Macera Caroline A., Andersen Ross E. (2001) Television watching, energy intake and obesity in U.S. children: results from the Third National Health and Nutrition Examination Survey, 1988–1994. *Arch. Pediatr. Adolesc. Med.*, 155, 360–65.  
<https://doi.org/10.1001/archpedi.155.3.360>
- Dörnyei Krisztina, Gyulavári Tamás, Hofmeister Tóth Ágnes, Jenes Barbara, Jentetics Kinga, Neumann Bódi Edit, Neulinger Ágnes, Simon Judit, Zsótér Boglárka (2014) Marketing az egészségtudatosságért – a marketing pozitív szerepe az egészség-tudatosságtól a termékválasztásig. Tomcsányi Pál akadémikus 90 éves: Az életminőség anyagi és szellemi igényeinek kielégítése fogyasztási marketing szemlélettel: Felolvasó ülés és tanulmánykötet. MTA Agrár-közgazdasági Bizottság Agrármarketing Albizottság, Budapest, 65–91.

- Eagle Lynne, Bulmer Sandy, De Bruin Anne, Kitchen Philip (2004) Exploring the link between obesity and advertising in New Zealand. *Journal of Marketing Communications*, 10, 49–67. <https://doi.org/10.1080/1352726042000207199>
- Ebenegger Vincent, Marques-Vidal P. M., Nydegger Andreas, Laimbacher J., Niederer I., Bürgi Flavia, Giusti Vittorio, Puder J. Jardena (2011) Independent contribution of parental migrant status and educational level to adiposity and eating habits in preschool children. *European Journal of Clinical Nutrition*, 65(2), 210–218. <https://doi.org/10.1038/ejcn.2010.248>
- Farrow Claire V., Galloway Amy T., Fraser, K. (2009) Sibling eating behaviours and differential child feeding practices reported by parents. *Appetite*, 52(2), 307–312. <https://doi.org/10.1016/j.appet.2008.10.009>
- Fitzpatrick Eileen, Edmunds Lynn S., Dennison Barbara A. (2007) Positive effects of family dinner are undone by television viewing. *Journal of the American Dietetic Association*, 107(4), 666–671. <https://doi.org/10.1016/j.jada.2007.01.014>
- Ford Christopher, Ward Dianne, White Mary (2012) Television viewing associated with adverse dietary outcomes in children ages 2–6. *Obesity Reviews*, 12(13), 1139–1147. <https://doi.org/10.1111/j.1467-789X.2012.01028.x>
- Francis Lori A., Birch Leann L. (2006) Does eating during television viewing affect preschool children's intake? *Journal of the American Dietetic Association*, 106(4), 598–600. <https://doi.org/10.1016/j.jada.2006.01.008>
- Galst Joann Paley, White Mary Alice (1976) The unhealthy persuader: the reinforcing value of television and children's purchase influence attempts at the supermarket. *Child Development*, 47, 1089–96. <https://doi.org/10.2307/1128446>
- Goldman Jane A., Descartes Lara (2016) Food depictions in picture books for preschool children: Frequency, centrality, and affect. *Appetite*, 96, 203–208. <https://doi.org/10.1016/j.appet.2015.09.018>
- Gorn Gerald J., Goldberg Marvin E. (1982) Behavioral evidence of the effects of televised food messages on children. *Journal of Consumer Research*, 9(2), 200–205. <https://doi.org/10.1086/208913>
- Gortmaker Steven L., Must Aviva, Sobol Arthur M., Peterson Karen, Colditz Graham A., Deitz William H. (1996) Television viewing as a cause of increasing obesity among children in the United States, 1986 – 1990. *Arch. Pediatr. Adolesc. Med*, 150, 356–62. <https://doi.org/10.1001/archpedi.1996.02170290022003>
- Halford Jason C. G., Boyland Emma J., Hughes Georgina M., Oliveira Lorraine P., Dovey Terrance M. (2007) Beyond-brand effect of television food advertisements/ commercials on caloric intake and food choice of 5–7-year-old children. *Appetite*, 49, 263–267. <https://doi.org/10.1016/j.appet.2006.12.003>
- Halford Jason C. G., Boyland Emma J., Hughes Georgina M., Stacey Leanne, McKean Sarah, Dovey Terrance M. (2008) Beyond-brand effect of television food advertisements on food choice in children. The effects of weight status. *Public Health Nutrition*, 11, 897–904. <https://doi.org/10.1017/S1368980007001231>

- Harris Jennifer L., Bargh John A. (2009) Television viewing and unhealthy diet: implications for children and media interventions. *Health communication*, 24(7), 660–673. <https://doi.org/10.1080/10410230903242267>
- Hertzler Ann A., Frary Robert B. (1999) Preschool children's food problems and food-related caregiving techniques. *International Journal of Consumer Studies*, 23(3), 147–154. <https://doi.org/10.1046/j.1365-2737.1999.00092.x>
- Hofmeister-Tóth Ágnes (2016) Fogyasztói értékek, trendek és magatartás: Korreferátum Törőcsik Mária: A fogyasztói magatartás új tendenciái című tanulmányához. *Vezetéstudomány*, 47(4), 26–29.
- Jahnke Dörte L., Warschburger Petra A (2008) Familial transmission of eating behaviors in preschool-aged children. *Obesity*, 16(8), 1821–1825. <https://doi.org/10.1038/oby.2008.255>
- Landon Jane (2013) News report. Gaps and weaknesses in controls on food and drink marketing to children in the UK. *Appetite*, 62, 187–189. <https://doi.org/10.1016/j.appet.2012.10.024>
- Lang Annie (2000) The limited capacity model of mediated message processing. *Journal of Communication*, 50(1), 46–70. <https://doi.org/10.1111/j.1460-2466.2000.tb02833.x>
- Manios Yannis, Kondaki Katerina, Kourlaba Georgia, Grammatikaki Evangelia, Birbilis Manolis, Ioannou Elina (2009) Television viewing and food habits in toddlers and preschoolers in Greece: the GENESIS study. *European Journal of Paediatrics*, 168(7), 801–808. <https://doi.org/10.1007/s00431-008-0838-3>
- Marshall David, O'Donohoe Stephanie, Kline Stephen (2007) Families, food, and pester power: beyond the blame game? *Journal of Consumer Behaviour*, 6(4), 164–181. <https://doi.org/10.1002/cb.217>
- McAlister Anna R., Cornwell Bettina T. (2010) Children's brand symbolism understanding: Links to theory of mind and executive functioning. *Psychology & Marketing*, 27(3), 203–228. <https://doi.org/10.1002/mar.20328>
- Neulinger Ágnes (2015) Born to buy? The influence of consumer kids on family consumption. 2. Kids and Retailing Colloquium: Future trends. Budapest, 18–19 June.
- Notten Natascha, Kraaykamp Gerbert, Tolsma Jochem (2013) Parents, Television and Children's Weight Status. *Journal of Children and Media*, 7(2), 235–252. <https://doi.org/10.1080/17482798.2012.712917>
- Nunnally Jum C. (1978) *Psychometric Theory*, 2nd edn. McGraw-Hill, New York.
- Ouwens Machteld A., i Martí Ausiàs Josep Cebolla, Van Strien Tatjana (2012) Eating style, television viewing and snacking in pre-adolescent children. *Nutricion hospitalaria*, 27(4), 1072–1078. <https://doi.org/10.3305/nh.2012.27.4.5805>
- Pérez-Farinós Napoleón, Villar-Villalba Carmen, Sobaler Ana María López, Saavedra María Ángeles Dal Re, Aparicio Aranzau, Sanz Sara Santos, Anta Rosa María Ortega (2017) The relationship between hours of sleep, screen time and frequency of food and drink consumption in Spain in the 2011 and 2013 ALADINO: a cross-sectional study. *BMC Public Health*, 17(1), 33. <https://doi.org/10.1186/s12889-016-3962-4>
- Piaget Jean (1970) Piaget's theory. In: P. H. Mussen (Ed.) *Carmichael's manual of child psychology* (pp. 703–732). New York, Wiley.



- Proctor M. H., Moore L. Lynn, Gao D., Cupples L. A., Bradlee M. L., Hood M. Y., Ellison R. C. (2003) Television viewing and change in body fat from preschool to early adolescence: The Framingham Children's Study. *International Journal of Obesity*, 27, 827–833. <https://doi.org/10.1038/sj.ijo.0802294>
- Rodgers F. Rachel, Paxton J. Susan, Massey Robin, Campbell J. Karen, Wertheim H. Eleanor, Skouteris Helen, Gibbons Kay (2013) Maternal feeding practices predict weight gain and obesogenic eating behaviors in young children: a prospective study. *International Journal of Behavioral Nutrition and Physical Activity*, 10(1), 24. <https://doi.org/10.1186/1479-5868-10-24>
- Rozendaal Esther, Lapiere Matthew A., Van Reijmersdal Eva A., Buijzen Moniek (2011) Reconsidering advertising literacy as a defense against advertising effects. *Media Psychology*, 14(4), 333–354. <https://doi.org/10.1080/15213269.2011.620540>
- Rudd Center (2017) Food industry self-regulation after 10 years: progress and opportunities to improve food advertising to children. Retrieved from: <http://www.uconnruddcenter.org/facts2017> (2019.06.03)
- Song Hayeon, Halvorsen Bonnie, Harley Amy (2014) Marketing cereal to children: content analysis of messages on children's and adults' cereal packages. *International Journal of Consumer Studies*, 38(6), 571–577. <https://doi.org/10.1111/ijcs.12116>
- Sweetman Claire, Wardle Jane, Cooke Lucy (2008) Soft drinks and desire to drink in preschoolers. *International Journal of Behavioral Nutrition and Physical Activity*, 5(1), 60. <https://doi.org/10.1186/1479-5868-5-60>
- Tóth Loretta (2018) Útikönyv a médiatudatossághoz. *Jel-Kép*, 2018/1. 131–133.
- Trofholz C. Amanda, Tate Allen, Loth Katie, Neumark-Sztainer Dianne, Berge M. Jerika (2019) Watching Television while Eating: Associations with Dietary Intake and Weight Status among a Diverse Sample of Young Children. *Journal of the Academy of Nutrition and Dietetics*, <https://doi.org/10.1016/j.jand.2019.02.013>
- Twarog P. John, Politis D. Maria, Woods L. Emily, Boles K. Matthew, Daniel M. Lauren (2015) Daily television viewing time and associated risk of obesity among US preschool aged children: An analysis of NHANES 2009–2012. *Obesity research & clinical practice*, 9(6), 636–638. <https://doi.org/10.1016/j.orcp.2015.09.004>
- Valkenburg Patti M., Cantor Joanne (2001) The development of a child into a consumer. *Journal of Applied Developmental Psychology*, 22(1), 61–72. [https://doi.org/10.1016/S0193-3973\(00\)00066-6](https://doi.org/10.1016/S0193-3973(00)00066-6)
- Viana Victor, Sinda Susana, Saxton J. C. (2008) Children's Eating Behaviour Questionnaire: associations with BMI in Portuguese children. *British Journal of Nutrition*, 100(2), 445–450. <https://doi.org/10.1017/S0007114508894391>
- Wardle Jane, Guthrie Carol Ann, Sanderson Saskia, Rapoport Lorna (2003) Development of the children's eating behaviour questionnaire. *Journal of Child Psychology and Psychiatry*, 42(7), 963–970. <https://doi.org/10.1111/1469-7610.00792>
- Webber Laura, Cooke Lucy, Hill Claire, Wardle Jane (2010) Associations between children's appetitive traits and maternal feeding practices. *Journal of the American Dietetic Association*, 110(11), 1718–1722. <https://doi.org/10.1016/j.jada.2010.08.007>

- Wenhold Halie, Harrison Kristen (2018) Television use and family mealtimes among a sample of US families with preschoolers. *Journal of Children and Media*, 12(1), 98–115. <https://doi.org/10.1080/17482798.2017.1395751>
- Whalen Rosa, Harrold Joanne, Child Simon, Halford Jason, Boyland Emma (2017) Children's exposure to food advertising: the impact of statutory restrictions. *Health promotion international*. <https://doi.org/10.1093/heapro/dax044>
- Wicks Jan LeBlanc, Warren Ron, Fosu Ignatius, Wicks H. Robert (2009) Dual-modality disclaimers, emotional appeals, and production techniques in food advertising airing during programs rated for children. *Journal of Advertising*, 38(4), 93–105. <https://doi.org/10.2753/JOA0091-3367380407>