Can food attitudes predict healthier food choice among school-age children?

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Abstract:

The purpose of this research was to examine whether children's attitudes and behaviors can predict food choice (i.e. consumption)? In current research, children's food attitudes, TV watching habits and behavioral food choice were tested. In total, 150 children (80 girls and 70 boys) aged 6 to 9 years participated in this study. The results demonstrated that children had positive attitudes toward healthy food. The effect of age was significant and negative, meaning that younger children made healthier food choices. Moreover, children who did not watch much TV on weekends, self-reported positive food attitudes towards healthy foods, which, in turn, positively predicted healthier food choices.

Keywords: food attitudes, food choice task, TV viewing

1. Introduction

Consumer behavior when choosing food is the current topic in social and behavioral scientific areas. Despite the positive expressed attitudes of consumers towards a sustainable and healthy lifestyle, the behavior shifts in the wrong direction (White, Habib & Hardisty, 2019). Childhood obesity has reached critical proportions all around the world. Globally, the distribution of overweight and obesity has increased dramatically among children aged 5 to 19, with 4% in 1975 to 18% in 2016 (WHO, 2016). Since it is known that obesity in childhood transits into adulthood, this emphasizes a group of 41 million children with potential to become adults with excess weight and obesity with serious consequences for health (Smith, Kelly, Yeatman & Boyland, 2019).

In order to change children's behavior towards food, it is necessary to change their food attitudes, but so far there is no empirical evidence for this conclusion (Monnery-Patris, Marty, Bayer, Nicklaus & Chambaron, 2016). So far, only a few authors have investigated children's attitudes toward food (Marty, Chambaron, Bournez, Nicklaus & Monnery-Patris, 2017; DeJesus, Gelman & Lumeng, 2020). A child's attitude toward food may better predict what the child will actually consume (Birch, 1999). Children's attitudes about food influence their choice of consumption and education, as well as passive learning, can shape their attitudes (DeJesus et al., 2020).

It turned out that the attitude is a factor with the highest predictive value for food choice (Gorton and Barjolle, 2013). It is important to understand the correlates of children's attitudes toward healthy and unhealthy foods, especially given that childhood eating habits and attitudes typically persist into adulthood (Skinner, Carruth, Bounds, & Ziegler, 2002). There is less consensus about understanding the nature of children's attitudes to food. To date only few studies have investigated attitudes toward food in children (Marty, Chambaron, Bournez, Nicklaus & Monnery-Patris, 2017, p.2).

Moreover, several studies regarding children's food attitudes and behaviors relied only on questions directed at parents (Carnell, Cooke, Cheng, Robbins, & Wardle, 2011). Consequently, fewer insights from children than from parents exist in current literature, and insights from children are incomplete due to variability in the types of attitudes investigated (automatic vs. self-reported), leading to a fragmented and incomplete picture. Therefore, it is necessary to conduct a more complete investigation that accounts for directly measured (self-reported) attitudes of children toward healthy food (e.g., Craeynest et al., 2005; DeJesus et al., 2020; Monnery-Patris, Marty, Bayer, Nicklaus, & Chambaron, 2016).

In this study we investigate children's attitudes toward healthy foods in a sample of children aged 6 to 9 years. This age range is interesting for several reasons but most important is that children of these ages are often difficult to reach and are largely underrepresented in food research (Van der Heijden et al., 2020, p. 9). Elementary school provides an important window of opportunity for understanding the malleability of children's attitudes toward foods, which can influence subsequent food behavior (DeCosta et al., 2017).

The goal of the study is to detect can children's lifestyle predict food choice (i.e. consumption). To do that, it is crucial to increase understanding of the development of children's attitudes toward healthy foods.

2. Literature review

Consumer behavior is most explained by the theory of planned behavior, which implies that attitudes overlook behavior (Ajzen, 1991). Perceived attitudes, norms and control should explain why consumers behave in a certain way (Ajzen, 2015). However, there is more and more evidence that there is a gap between the attitude and behavior of the consumers (Elhaffar, Durif & Dube, 2020). The aforementioned discrepancy is mentioned in food research such as green shopping (Gupta & Ogden, 2006; Duong, 2021) and buying organic food (Vermeir & Verbeke, 2006; Chekima, Igau, Wafa & Chekima, 2017; Schäufele & Janssen, 2021). Knowledge about food should be translated into actual behavior so it is important to find appropriate methods that can bridge this gap (Variyam, 2001).

Child attitudes toward food can provide a better prediction of what a child will actually consume (Birch, 1999). Children's attitudes about food influence their choice of consumption, and conscious education as well as passive learning can shape their attitudes (DeJesus, Gelman & Lumeng, 2020). It is important to understand child attitudes for obesity prevention and management (Craeynest, Crombez, De Houwer, Deforche, Tanghe & De Bourdeaudhuij, 2005). Attitudes significantly influence children's food choices (children who have low attitude towards food chose the least number of options with healthy food; Marty et al., 2017).

Within food marketing area (Craeynest, Crombez, De Houwer, Defcheche, Tanghe & De Bourdeaudhuij, 2005; Guthrie, Mancino & Lin, 2015; Smith, Kelly, Yeatman & Boyland, 2019; Beattie & McGuire, 2020; Vandenbroele, Vermeir, Geuens, Slabbinck & Van Kercckh, 2020), literature concludes that it is necessary to find ways to change children attitudes and purchase behavior when choosing food (especially healthy food). Most of the investigations of attitudes towards food referred to an adult population, and it would be wrong to conclude that children react in the same way. Therefore, it remains unclear how children change attitudes, in which environment and under what conditions.

According to Campos, Doxey and Hammond (2011) and Drichutis, Lazaridis and Nayga (2006), informations can play a primary role in food-related behavior and information is positively associated with healthier food choices. Some studies have analyzed how information influence attitudes (Tudoran, Olsen and Dopico, 2009). Also, so far very little research has followed how children react to words and feelings (emoticons). Conclusion of a study conducted by Gallo, Swaney-Stueve and Chambers (2017) says that children respond positively to the use of emotions to talk about how feel about choosing different foods.

One of the most mentioned factors is TV viewing time. Watching television is an important environmental factor and there is considerable interest in the relation between children's television watching habits, attitudes toward food, and behavior (Boyland, Harrold, Kirkham, & Halford, 2012; Powell, Szczypka, Chaloupka, & Braunschweig, 2007). In countries like Croatia, where television watching overwhelmingly involves channels operated by private broadcasters, viewers are inevitably exposed to advertisements. Television advertisements are skewed toward processed foods high in fat and sugar, with relatively few for fruits and vegetables (Whalen, Harrold, Child, Halford, & Boyland, 2017). Children's exposure to advertisements while watching television is expected to affect their attitudes.

3. Methodology

In total, 150 school-age children were involved in this study. The study involved 80 girls (53 %) and 70 boys (47 %) aged 6 to 9 years from elementary school in Croatia. Children were tested about their attitudes, because they can involve the assessment of the costs and benefits of a specific behavior, as well as rational decision making (Calitri, Lowe, Eves, & Bennett, 2009). Attitudes are easily accessible and thus can be measured through direct self-reports that permit cognitive reflection (Fazio & Olson, 2003). After finishing the test, children's weight and height were measured and date of birth written for the purpose of calculating their BMI. Also, children self-reported on how many hours during weekend days you spend watching TV/videos. The last part of the research was food choice task where children had to choose between of either a piece of fruit jelly (mandarin shaped) or a slice of a peeled mandarin from two same bowls placed on a table in a corner of a classroom. Children did food choice task one by one. Written informed consent was obtained from each parent (household representative) prior to data collection. Research was conducted in period October 2021 – April 2022.

3.1. Children's food attitudes

Children completed eight items related to their attitudes toward vegetables, measured on a 4-point Likert scale (ranging from 0= disagree a lot, 1 = disagree a little, 2= agree a little, 3= agree a lot). Questions 2 and 4 are reverse coded, so were recoded when calculating a mean.

3.2. Children's BMI

World Health Organization announced in 2016 obesity rates in younger children around the world. Data shows the prevalence of obesity in kids between ages 5 and 9. Average rate for Croatia is between 15 and 20%, and the average rate (both girls and boys) in our research is 18,75. Children's BMI was calculated using calculator that provides body mass index and the corresponding BMI-for-age percentile based on CDC growth charts for children and teens ages 2 through 19 years, and scaled the responses because the same male and female scores do not fall into the same category. After scaling we got the values: 1 – underweight; 2- healthy weight; 3- overweight; 4 – obese.

3.3. TV viewing

Following the collection of information on food attitudes, children also reported the average number of hours they spent watching television per day during weekends. This was coded in intervals: *none* (0), *one hour* (1), *two hours* (2), *three hours* (3), and *four hours* (4).

3.4. Food choice task

When finished with an attitude measure, each child, as an alleged gesture of appreciation for them partaking in the study, had the option to choose a slice of one of the two provided snack options. One of which was a slice of a peeled mandarin (which was provided peeled and offered in separate slices), the other one was a piece of mandarin shaped fruit jelly

(Naderer, Matthes, Binder, Marquart, Mayrhofer, Obereder & Spielvogel, 2017). Each child was allowed to pick only one option from two same bowls placed on a table in a corner of a classroom, and researchers noted the child's snack selection. Once all children from one class were interviewed, the children were extensively debriefed about the purpose of the study as well as healthy eating behavior.

4. Results

In total, 150 children (80 girls and 70 boys) participated in a research (M=1.47, SD=,500). Children were 6 to 9 years old (M=7,71, SD=,92). As the dependent variable, food choice (i.e., consumption) of children choosing between a piece of fruit jelly (mandarin shaped) or a slice of a peeled mandarin from two same bowls placed on a table in a corner of a classroom was measured. As predictors, children's food attitudes as well as children's BMI that was calculated based on primary data collected during the research were selected. The BMI was calculated as a ratio of children's weight and their height. For children, the standard deviation score of BMI (zBMI) is commonly computed to adjust for age and sex (Brown et al., 2008; De Decker et al., 2016).

Picture 1: Food choice task

4.1. *Children's food attitudes*

Internal consistency of measuring food attitude was satisfactory: Cronbach's alpha = .76. The results show that children in Croatia have a positive attitude towards healthy food with an average value of 2,38.

Table 1. Food attitudes descriptives

	Mean	Std. Deviation	N
I enjoy eating vegetables	2,4600	,73849	150
I wish I didn't have to eat vegetables	2,1600	1,05602	150
I like every dish that contains vegetables	1,9667	,99944	150
Vegetables are tasteless	2,3733	1,02680	150
Vegetables makes me strong	2,7867	,59738	150
Vegetables makes me happy	2,3800	,86444	150
Vegetables are healthy	2,9400	,31152	150
Vegetables are one of my favorite foods	2,0400	,94748	150

4.2. Children's BMI

Healthy children (girls and boys) are those who had "healthy weight" BMI (BMI from the 5th percentile to below the 85th percentile), and unhealthy children are those who had "overweight" BMI (BMI above the 85th percentile to below the 95th percentile). However, if we look at the overall results, the average child BMI in the sample of 150 respondents is 2.39, which puts children in Croatia in a „healthy weight" category.

4.3. Food choice task

As might be expected given the BMI results obtained, the task of choosing a diet between fruit and jelly led to a result that shows that more children chose fruit over jelly (M=1,38; SD=0,49). The children's choices were coded as follows: 1- mandarin, 2-jelly.

4.4. Food choice-related behaviors

To examine the relationship between food attitudes, BMI, TV viewing and food choices hierarchical regression was conducted for 2 subsamples (children who do not watch much TV on weekends (0-1 h per day) and children who watch much TV on weekends (2-4 h per day)). Food choice was set as dependent variable, and BMI, age, gender and attitudes were entered as independent variables. Table 1 summarizes the results. The effect of age is significant and negative in both models meaning that younger children make healthier food choices. Also, for children who do not watch much TV on weekends, their own self-reported attitudes are (positively) predictive of healthier food choices. This is true after accounting for BMI, age and gender. The model explains 37% of variance in food choices.

Table 2: Linear regression predicting food choice

		Dependent measure							
		Food choice							
		DO NOT watch much TV on weekends				**Watch** much TV on weekends			
Model	Predictors	β	*t*	ΔR^2	*p*	β	*t*	ΔR^2	*p*
1	Child gender	,031	,256	,125	,799	-,161	-1,444	,108	,153
	Child age	-,230	-1,826	,068	,073	**-,244**	**-2,196**	**,058**	**,031**
	BMI	-,203	-1,601	,087	,114	-,045	-,420	,079	,676
2	Child gender	-,004	-,032	,123	,975	-,165	-1,483	,108	,142
	Child age	**-,241**	**-1,974**	**,066**	**,053**	**-,260**	**-2,314**	**,058**	**,023**
	BMI	-,150	-1,194	,086	,237	-,054	-,501	,079	,618
	Food attitude	**,267**	**2,204**	**,175**	**,031**	-,112	-1,033	,092	,305

5. Discussion and conclusion

The present study had several strengths. Firstly, this is attempt of empirical research of three environmental variables that contribute to child healthy eating: actual food choice to understand children's food consumption preferences, their attitudes (DeJesus, Gelman & Lumeng, 2020), child's BMI data (Czyzewska & Graham, 2008) and TV viewing (Boyland et al., 2012; Powell et al., 2007). Secondly, when comparing attitudes from one age to another, we found that age was positively related to more favorable attitudes toward healthy food. It is useful to compare these results with those of Marty, Chambaron, et al. (2017) and of Marty, Miguet, et al. (2017) regarding the relations between children's attitudes and age. Marty, Miguet, et al. (2017) found that attitudes influence children's food choices, but they did not explicitly investigate age-related factors. Thirdly, our results indicate that watching television has a significant and negative relation on attitudes, suggesting that healthy food becomes less appealing with increasing average daily time spent watching TV. Taken together, the results of this study underscore the importance of capturing children's food attitudes to provide a more complete picture of how children's developing attitudes inform their food-related behavior.

Further research is warranted to explore whether the relations between watching television and food attitudes are causal or correlational. While watching television may increase exposure to advertisements that are overwhelmingly biased toward less healthy foods (Boyland et al., 2012), it may also be that long hours watching television and high consumption of unhealthy foods are both characteristics of less structured households (Brazendale et al., 2017). Unhealthy food becomes more appealing as children spend more time each day watching television. A danger is that excessively watching television counteracts the positive effects of nutritional education in schools. While causality is difficult to establish, efforts to curtail screen time nonetheless appear sensible. Public health guidelines worldwide suggest that children 5–12 years old should spend no more than two hours a day watching television (Cox, Skouteris, Dell'Aquila, Hardy, & Rutherford, 2013. Educators should work with parents to promote restrictions on screen time, communicating evidence that excessively watching television in early childhood is associated with adverse cognitive and behavioral outcomes. Removing televisions from children's bedrooms is one practical measure that gives parents greater control. While it is difficult to precisely assess exposure to commercials from the data, it is likely that the high prevalence of television advertisements promoting foods high in fat, salt, and sugar alters children's attitudes toward food.

However, this study has certain limitations as well. The present study is limited by the small sample size. A larger sample would have increased statistical power and would weaken the strength of outlying data. Second, we rely on self-reported measures for watching television, food-related beliefs, and food consumption. While children understood that the study was anonymous with no right or wrong answers, self-reported measures may still be subject to social biases.

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