Ad-Savvy Teens: How Advertising Literacy Shapes Adolescent Advertising Resistance across Borders

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Conflict of Interest

The authors declare that there is no conflict of interest.

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Abstract

This manuscript presents a cross-country study among N = 4,054 adolescents conducted in 2024 in eight European countries exploring the role of advertising literacy in adolescents' resistance towards unhealthy food advertising. The Food Marketing Defense Model argues that not only awareness and better understanding of advertising are needed to successfully defend against advertising influences, but individuals also need to be motivated and have the ability to defend themselves against these influences. The findings of this study show that participants' self-reported ability and motivation to resist unhealthy food advertising are stronger predictors of advertising resistance than their self-reported awareness and understanding of advertising. Additionally, results indicate that when participants' ability and motivation to resist advertising are stronger, the effect of awareness and understanding on advertising resistance weakens. These findings suggest that activating adolescents' ability and motivation to resist advertising is crucial to help them successfully resist unhealthy food advertising messages.

Keywords: Adolescents, Advertising, Advertising Literacy, Advertising Resistance, Food Marketing

Introduction

Over the past four decades, overweight and obesity rates among children and adolescents have increased globally (Abarca-Gómez et al., 2017). Unhealthy food marketing is an important predictor of these trends as it impacts the food preferences of children and adolescents (Norman et al., 2016). According to the Reactivity to Embedded Food Cues in Advertising Model of Folkvord and colleagues (2016), exposure to food marketing messages can evoke physiological and physical responses, impacting children's eating behaviours. Empirical studies indeed consistently show a link between food marketing exposure and eating habits. For instance, a meta-analysis by Boyland and colleagues (2022) of 80 articles, including 19.372 participants aged 0 to 19 years, found a significant association between unhealthy food marketing and food intake, food choice, and food preferences.

Adolescents are intensively targeted by food advertising (Truman & Elliott, 2019), as their eating habits undergo significant changes during adolescence, with them making more autonomous food choices and being more open to experimenting with new food products, in ways that are often persisting in the long term (Eetexpert, n.d.). Furthermore, adolescents are particularly prone to unhealthy food marketing messages. For instance, in two experimental studies involving adolescents aged 13 to 17 years, Murphy and colleagues (2020) found that adolescents respond more favourably to unhealthy food advertising on social media than to healthy food or non-food advertising. These food advertising messages are often strategically designed to align with adolescents' sensitivities to bypass their scepticism (Harris & Fleming-Milici, 2019). For instance, influencer marketing leverages adolescents' susceptibility to peer influences and its' embedded nature makes it harder to detect and resist its' persuasive intent (Harris & Fleming-Milici, 2019; Sweeney, Lawlor, & Brady, 2022). This finding raises questions about how adolescents can be better supported in resisting food advertising.

The current study examines to what extent adolescents can resist unhealthy food advertising and the role advertising literacy plays in this process. Advertising resistance refers to adolescents' efforts to reduce the persuasive impact of advertising. More precisely, the ACE framework, developed by Fransen and colleagues (2015), suggests this can be done in three ways; by avoiding exposure to advertising messages (Avoidance), formulating counterarguments (Contesting) or bolstering existing attitudes (Empowerment). By doing so, this study forms a crucial base to guide future interventions effectively stimulating advertising resistance among this vulnerable target group. In addition, we use the Food Marketing Defense Model by Harris and colleagues (2009) to develop a better understanding of the factors contributing to adolescents' resistance to unhealthy food advertising. The model suggests that, to effectively resist food marketing, it is crucial not only to be aware of and understand advertising tactics (i.e., being ad literate), but also to have the ability and willingness to defend against it. Advertising literacy theory suggests that adolescents are not yet fully ad literate, especially not for embedded, interactive, and personalized ad formats (Hudders et al., 2017). Moreover, even if adolescents are aware of advertising and have a proper understanding of its tactics, they may lack the ability and motivation to resist advertising (Murphy et al., 2020). This study aims to tackle the lack of empirical investigation into the role of these dimensions (i.e., awareness & understanding and ability & motivation) in adolescents' advertising resistance across Europe.

While De Jans et al. (2018) provided valuable insights into the relationship between advertising literacy and resistance among Flemish adolescents, their study was limited to a single country and did not account for the role of ability and motivation to resist advertising. Hence, the present study builds on this work by examining resistance to unhealthy food advertising across multiple countries, while also incorporating perceived ability and motivation alongside advertising awareness and understanding. This study is part of a

European research project aimed at developing evidence-based interventions to improve adolescents' health behaviours as a primary prevention of cancer, two of which specifically target resistance to unhealthy food advertising. To inform these interventions across the eight participating countries (Belgium, Cyprus, Greece, Italy, Romania, Slovenia, Spain, and Switzerland), we surveyed 4,054 adolescents aged 12 to 18 to examine cross-country differences in the relationship between advertising literacy and advertising resistance.

Method

Study Design

Data was collected from respondents through a large-scale, cross-sectional, and cross-country survey, using a convenience sample, and distributed via the online survey platform Qualtrics. The data were collected in eight countries (Belgium, Cyprus, Greece, Italy, Romania, Slovenia, Spain, and Switzerland) among adolescents between 12 and 19 years, mostly through recruitment in schools. The survey was drafted in English and consequently translated into all countries' official languages by a native speaker and consequently back translated by a second native speaker. Filling out the survey took approximately 10 to 15 minutes. This study is part of a larger study designed to assess various aspects of psychological and physical well-being, health perceptions, and behaviours. The section relevant for this study cover the frequency of unhealthy food consumption, intentions to reduce unhealthy behaviours and advertising literacy regarding unhealthy food. Ethical approval was obtained for this study for the whole study (number 2024-14). The survey study was preregistered on Open Science Framework and can be found at https://tinyurl.com/56vykzkz.

Sample

Schools were the first point of contact to collect the data. The team strived for a diversity in terms of gender, age, rural versus urban schools and educational track. The

procedure was slightly different in the participating countries due to intercultural differences in research standards, e.g., the monetary incentives provided differed between countries. The total number of collected questionnaires was 7857, of which $N = 4054$ were considered valid after quality control: participants had to be between 12 and 18 years old, they had to complete at least 70% of the survey items, and both parental and adolescent informed consent had to be obtained. To achieve a representative sample of 12- to 18-year-olds across the eight European countries, a two-stage weighting approach was implemented. This weighting adjusted for gender imbalances within each country and for differences in country-level population proportions using Eurostat demographic data. To prevent artificial inflation of the effective sample size, the final weights were normalized to an average value of 1, which maintained proportional differences between cases while keeping the overall sample size unchanged.

The sample included 46.2% male and 46.1% female participants. 3.2% of students preferred not to declare their gender, 2.1% declared themselves to be of another gender, and 0.5% declared themselves to be non-binary. For the group comparisons with regard to gender, we only included participants who identified as male or female. The mean age of the sample was M=15.47 (SD=1.67) years and 23.7% of the participants had a migration background. Furthermore, 39.6% of the participants lived in a predominantly urban area, 10.6% in a predominantly rural area and 46.3% in an intermediate location. The mean affluence of participants was 4.61 (SD = 1.77) on a ten-point scale, with low scores indicating higher affluence.

Measures

The full measurement instrument used in the survey can be found at https://tinyurl.com/56vykzkz. The measures that we used for the analyses in this study can be found in Appendix 1.

Food Marketing Defense Model Constructs

Based on the Food Marketing Defense Model, the dimensions awareness, understanding, ability, and motivation (Harris et al., 2009) were measured on a five-point Likert scale. As no existing scale measures these dimensions, we developed twelve items based on previously validated measures, keeping the number of items limited to reduce respondent fatigue. A principal components analysis (PCA; oblimin rotation) indicated the data were suitable for factor analysis and revealed two interpretable dimensions explaining 41.4% of the variance. The first dimension captures participants' *ability and motivation* to resist advertising (five items; $\alpha = .72$), and the second reflects *awareness and understanding* of advertising (five items; $\alpha = .69$). A third factor grouping two reverse-coded items was excluded, as it was theoretically difficult to distinguish from the second dimension and likely reflected confusion with the reversed coding format.

Advertising Resistance Construct

Similar to the measurement of the Food Marketing Defense Model dimension, no scale exists to date to measure the Avoidance, Contesting and Empowerment dimensions of advertising resistance. We therefore formulated three items to capture each dimension, based on existing measures. PCA (oblimin rotation) revealed two interpretable dimensions explaining 51.6% of the variance. The first dimension groups the *avoidance and contesting* items (six items; $\alpha = .78$), and the second captures *empowerment* (two items). One empowerment item was removed due to low communality (.15) and a weak factor loading. Two subscales; avoidance/contesting and empowerment were constructed and used as dependent variables in the analyses.

Data Analyses

Data were analysed using SPSS Version 29 and all analyses were conducted on the weighted data. First, paired-samples t-tests were conducted to compare the means of the subdimensions within the Food Marketing Defense Model. Next, stepwise linear regression

analyses were performed to examine the predictive power of the *awareness and understanding* and *ability and motivation* subdimensions in relation to advertising resistance and its subdimensions. Variables were mean centred for this analysis. To conclude, we examined the role of age in advertising understanding and resistance.

Findings

Descriptive Analyses and Mean Comparison

Participants' mean score on the *awareness and understanding* subdimension (M = 3.62, SD = .83) is significantly lower than their mean score on the *ability and motivation* subdimension (M = 3.68, SD = .77), but with a very small effect size indicating a negligible difference ($t(4053) = -3.94$, $p < .001$, *Cohen's d* = -.06). These findings indicate a moderate awareness and understanding of food advertising and a moderate motivation and ability to resist advertising. Participants' mean score on the *avoidance and contesting* subdimension of advertising resistance (M = 3.21, SD = .89) is significantly lower than their mean score on the *empowerment* subdimension (M = 3.81, SD = .95), with a medium effect size ($t(4053) = -36.34$, $p < .001$, *Cohen's d* = -.57). These findings indicate that empowerment is a more often used strategy to resist food advertising compared to avoidance and contesting.

Predictive Analyses

First, a stepwise linear regression analysis with the two advertising resistance subdimensions (separately) as the dependent variable, and the subdimensions of *awareness and understanding*, and *motivation and ability* as predictors in the first step, and their interaction in the second step was conducted. Findings revealed that the model for *avoidance and contesting* is significant ($F(2, 4051) = 338.26$, $p < .001$) and explains 37.8% of the variance in avoidance and contesting. Both variables were significant predictors of avoidance and contesting, with motivation and ability being a stronger predictor ($\beta = .35$, $t = 21.81$, p <

.001) than awareness and understanding (β = .06, t = 3.55, p < .001). The interaction term is significant (β = -.04, t = -2.81, p = .005), but offers limited additional explained variance (ΔR^2 = 0.2%, F(1, 4049) = 7.88, p = .005). The interaction suggests that the impact of *awareness and understanding* on avoidance and contesting decreases when *motivation and ability* increase.

Furthermore, findings revealed that the model for *empowerment* is likewise significant ($F(2, 4051)$ = 870.87, p < .001) and explains 54.8% of the variance in empowerment. Both variables were significant predictors of empowerment, with motivation and ability again being a stronger predictor (β = .44, t = 30.44, p < .001) than awareness and understanding (β = .19, t = 12.90, p < .001). The interaction term is significant but negligible (β = -.04, t = -2.60, p = .009), thus again offers limited additional explained variance (ΔR^2 = 0.1%, F(1, 4049) = 6.75, p = .009). The total model explains 54.9% of the variance in empowerment. Across both resistance strategies, motivation and ability was the stronger predictor, with awareness and understanding playing a smaller role, particularly for empowerment. The significant but negligible interaction suggests *awareness and understanding* matter less when *motivation and ability* are already high.

Finally, a correlational analysis shows weak, but significant correlations between age and advertising resistance dimensions. The older the participants were, the more likely they form counterarguments and avoid advertising (r = .046, p = .003) and use empowerment as resistance strategy (r = .050, p < .001). While there is a significant, but weak correlation between age and advertising awareness and understanding (r = .037, p = .018), there is no significant correlation with ability and motivation (r = .007, p = .637).

Discussion

Based on a survey conducted in eight European countries among 4,054 adolescents, this study examined the role of awareness, understanding, ability, and motivation in

adolescents' resistance to unhealthy food advertising. Overall, adolescents demonstrated a moderate to high level of resistance to such advertisements, suggesting that they already exhibit critical attitudes and behaviours towards them. Our findings further reveal that while both awareness and understanding, and ability and motivation are significant predictors of advertising resistance, the latter is the stronger predictor. Moreover, the role of awareness and understanding decreases as motivation and ability increase. This aligns with De Jans and colleagues (2018), who found that cognitive advertising literacy had limited predictive power compared to affective and motivational processes. We also observed that *advertising resistance* increases with age as well as *awareness and understanding*, while there is no significant relation between *motivation and ability* and age. This findings suggest that while adolescents become more aware of advertising and understand it better when they are older, ability and motivation is not different and a stronger predictor for advertising resistance. Hence, our findings challenge the dominant moral panic discourse portraying adolescents as inherently vulnerable media users. Instead, our findings highlight their capacity for agency, particularly in how they navigate and respond to persuasive attempts within digital environments. What is novel in this study is the specific focus on unhealthy food advertising, whereas previous advertising literacy research mostly focused on advertising in general.

Policy implications

Current educational programs tend to focus awareness and understanding of how advertising works. While valuable, our findings suggest that fostering adolescents' motivation and ability to resist advertising may be even more impactful. Creating a policy environment that prioritizes healthy eating, and translating this into national, local, and school-level policies, could further enhance adolescents' motivation. This might include stricter regulations on unhealthy food marketing and more transparent communication about food advertising, reducing the burden on adolescents to constantly defend themselves against such

marketing. Furthermore, our results show that across countries, adolescents primarily use empowerment strategies in response to advertising, while avoidance and contesting strategies are less common. Based on our findings, educational programs could be tailored to emphasize foundational avoidance and contesting strategies, which adolescents currently apply less frequently. At the same time, the empowerment strategies adolescents already favour should be further reinforced, as these reflect a stable commitment to their own attitudes and opinions regarding unhealthy foods; a capacity for agency that interventions should build upon rather than overlook.

Limitations and Suggestions for future research

This study has several limitations. First, reliance on self-reported data may not fully capture implicit or automatic processing, which is particularly relevant in digital media environments where advertising exposure and resistance can operate below conscious awareness. Second, advertising literacy was measured without distinguishing between advertising formats, despite evidence that adolescents may be especially susceptible to embedded formats such as influencer marketing. Future research should examine format-specific effects on resistance strategies and consider alternative methodologies, such as media diaries or in-depth interviews to better capture real-life resistance behaviours. Longitudinal designs would further help to track how advertising resistance evolves across adolescence.

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Appendix 1. Measurement Instrument

The survey study is part of a larger survey. This document contains the measures reported in this study. For an overview of all measures, we refer to the preregistration document that can be found at https://tinyurl.com/56vykzkz.

Food Marketing Defense Model (Harris, Brownell, & Bargh, 2009)

The following questions are related to all advertising messages you personally encounter. This includes advertising on television, radio, the internet, billboards, influencer campaigns, etc.

Dimension	Items	Response Options	Reference
Attend to marketing stimuli	In the past week, how often did you see advertising messages for unhealthy foods?	*Never (1), less than once a week, once a week, several times a week, daily (5)*	
Comprehension of Persuasive Intent	Is the goal of unhealthy food advertising to make you want these unhealthy foods?	*Not at all (1), probably not, not sure, probably, definitely (5)*	Based on the understanding of persuasive intent dimension of Rozendaal, Opree and Buijzen (2016)
	Is the goal of unhealthy food advertising to increase your knowledge about these unhealthy foods? (R)	*Not at all (1), probably not, not sure, probably, definitely (5)*	
	Is the goal of unhealthy food advertising to make you feel positive about these unhealthy foods?	*Not at all (1), probably not, not sure, probably, definitely (5)*	
Understand process and outcomes	Do you know when an unhealthy food ad presents the food as healthier than it actually is?	*Not at all (1), probably not, not sure, probably, definitely (5)*	Based on the persuasion knowledge dimension of Bearden, Hardesty and Rose (2001)
	Do you have trouble understanding the tactics used by unhealthy food advertisers? (R)	*Not at all (1), probably not, not sure, probably, definitely (5)*	
	Do you know when an unhealthy food advertiser is pressuring you to buy the food?	*Not at all (1), probably not, not sure, probably, definitely (5)*	

Cognitive ability to effectively resist	When you see unhealthy food advertising … Do you understand the things the advertisers do to get your attention?	*Not at all (1), probably not, not sure, probably, definitely (5)*	Based on the critical thinking about media messages scale, as used in McLean, Paxton and Wertheim (2016) and (Scull et al., 2010)
	Do you know if the things that advertisers want you to do are good for you?	*Not at all (1), probably not, not sure, probably, definitely (5)*	
	Do you understand how true or false the advertisement is?	*Not at all (1), probably not, not sure, probably, definitely (5)*	
Available resources to resist	Do you have the time and energy to resist it?	*Not at all (1), probably not, not sure, probably, definitely (5)*	
Motivation to resist	Do you want to resist it?	*Not at all (1), probably not, not sure, probably, definitely (5)*	

Advertising Resistance (Fransen et al., 2015)

Dimension	Items	Response Options	Reference
Avoidance	Do you avoid it by going away?	*Not at all (1), probably not, not sure, probably, definitely (5)*	Based on the cognitive and behavioral ad avoidance dimensions used in Youn and Kim (2019) and based on Cho and as- (2004)
	Do you avoid it by skipping it, for example by using ad blockers?	*Not at all (1), probably not, not sure, probably, definitely (5)*	
	Do you ignore it?	*Not at all (1), probably not, not sure, probably, definitely (5)*	
Contesting	Do you refute it?	*Not at all (1), probably not, not sure, probably, definitely (5)*	Based on the counterarguing dimension, used in Van Reijmersdal et al. (2016) and based on Zuwerink Jacks and Cameron (2003)
	Do you contest it?		
	Do you doubt it?	*Not at all (1), probably not, not sure, probably, definitely (5)*	

Empowerment	Are you certain about your original opinions and attitudes towards unhealthy foods?	*Not at all (1), probably not, not sure, probably, definitely (5)*	Based on the attitude certainty item used in Blankenship, Machacek and Standefer (2023)
	Are you looking at what others think about unhealthy foods?	*Not at all (1), probably not, not sure, probably, definitely (5)*	
	Are you trusting your own opinions and attitudes about unhealthy foods?	*Not at all (1), probably not, not sure, probably, definitely (5)*	

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