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Adults' recall of food and beverage ads and their susceptibility to such advertising: A cross-sectional study in Uruguay

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Abstract

Background

Understanding how adults perceive the influence of food advertising on their own behavior is relevant for informing advocacy strategies to increase public support to regulatory actions. The objective of the study was to examine spontaneous recall of food and beverage ads across different media channels and self-perceived susceptibility to food and beverage advertising among adults living in Uruguay, a high-income Latin American country.

Methods

A cross-sectional telephone survey was conducted with a nationally representative sample of 1,000 Uruguayan adults recruited from a survey panel maintained by a market research company. Participants reported whether they had seen or heard a food or beverage ad in the preceding week and, if so, identified the medium and recalled the product or brand advertised. Perceived influence of advertising on purchasing decisions was assessed using a 5-point Likert scale. Logistic and ordinal regression models were used to examine associations with sociodemographic and health characteristics.

Results

50.4% of participants reported having seen a food or beverage ad in the prior week, and 95.4% of these were able to spontaneously recall at least one specific ad. Television was the most frequently cited medium (60.7%), followed by social media or websites (51.2%). Recalled content was dominated by sodas (58.8%), ultra-processed foods and a small number of brands, particularly Coca-Cola (30.3%). Higher education, younger age and capital city residence were positively associated with recall. Despite high recall levels, participants generally reported low perceived influence of advertising on their own purchasing decisions (mean: 2.7/5). Younger adults and those of lower socioeconomic status perceived greater advertising influence.

Conclusions

Results highlight the need for initiatives aimed at increasing awareness of the effects of marketing on food-related decisions.

Background

Marketing of unhealthy foods is recognized as a key commercial determinant of health [1]. Through a sequence of persuasive effects, exposure to marketing can shape product preferences, reinforce social norms, and promote consumption patterns that contribute to adverse health outcomes [2, 3]. Research

on marketing exposure and its effects has predominantly focused on children and adolescents, given their heightened susceptibility to persuasive influences due to their cognitive and developmental characteristics [4, 5]. However, adults are not immune to marketing effects either. Despite possessing greater cognitive resources and autonomy, adults remain vulnerable to persuasive marketing, and exposure to food marketing is associated with increased food selection and consumption [5]. Moreover, adults constitute a major target audience for marketers across a wide range of product categories and are expected to be continuously exposed to promotional content through both traditional and digital media [6–8].

The increasing scale, reach and sophistication of marketing activities across media underscore the need for empirical evidence on the type, extent and impact of marketing exposure among adults. The effectiveness of advertising largely depends on its ability to capture attention [2, 9]. Once attended to, advertising messages may be encoded into long-term memory and subsequently influence purchasing decisions [10, 11]. Although marketing can also affect behavior outside conscious awareness through mechanisms such as priming and peripheral cue processing, spontaneously recalled ads may represent those with the greatest potential to influence behavior at the point of purchase, particularly in situations involving impulse buying [10, 12, 13]. This is especially relevant for products that evoke hedonic and emotional responses, such as ultra-processed foods and other discretionary products, which account for a substantial proportion of impulse purchases [14–16].

A relevant but underexplored dimension of food marketing research concerns how individuals perceive the influence of advertising on themselves and others. A well-documented phenomenon in this area is the third-person effect, which describes the consistent tendency for individuals to believe that media messages have a greater persuasive impact on others than on themselves [17, 18]. In the context of food advertising, the third-person effect has been observed across diverse population groups: adults and young people frequently report viewing themselves as resistant or impervious to advertising, while simultaneously acknowledging its influence on others [19–21]. This perception of personal invulnerability, sometimes referred to as an "illusion of invulnerability," appears to be partly driven by self-enhancement motivations, whereby individuals seek to maintain a positive self-image as rational, autonomous and active agents rather than as passive patients of commercial persuasion [17, 18]. Understanding how adults perceive the influence of food advertising on their own behavior is therefore relevant for informing advocacy strategies to increase public support to regulatory actions.

Against this background, the present study examined adults' spontaneous recall of food and beverage ads across different media channels. As a secondary objective, it assessed associations between ad recall and sociodemographic characteristics. In addition, the study explored participants' self-perceived susceptibility to food and beverage advertising and its association with sociodemographic characteristics. The study was conducted in Uruguay, a high-income Latin American country, with a high prevalence of overweight and obesity among adults [22]. At the time of data collection, Uruguay had not implemented regulatory restrictions on food and beverage marketing across traditional or digital media channels.

Methods

The study employed a cross-sectional design. A telephone survey was conducted by a specialized survey company in March 2026 to explore citizens' opinions on food policies and their perceptions of various aspects of the food environment. The present study focuses on one section of the questionnaire, which assessed participants' spontaneous recall of food and beverage ads.

Participants

Eligible participants were adults (18 years or older) residing in Uruguay whose contact information was included in a panel maintained by a professional survey company. This panel comprised 85,638 individuals who had originally been recruited through random mobile-phone dialing in previous public opinion studies. Potential participants were contacted by trained interviewers and informed that the survey sought to explore opinions regarding food-related issues and eating habits. Each selected individual was contacted up to three times, except when the telephone number was no longer active. Participation was voluntary, and no financial incentives or other forms of compensation were offered.

The target sample size was determined based on the precision required to estimate population prevalences. Assuming the most conservative scenario (i.e., an expected prevalence of 50%), a sample of 1,000 participants provided an estimated margin of error of approximately ± 3.1 percentage points at the 95% confidence level. To improve the representativeness of the sample, quotas were established for age, gender, educational attainment and area of residence (Montevideo, the capital city, versus the rest of the country) during data collection.

Questionnaire

At the beginning of each telephone interview, participants were informed about the study objectives, and the informed consent statement was read aloud. Oral informed consent was then obtained and recorded. The questionnaire comprised a combination of open-ended, multiple-choice and closed-ended questions organized into seven modules: (i) opinions on food-related public policies; (ii) perceptions of the adequacy of current policies and the need for additional actions; (iii) awareness of the Uruguayan dietary guidelines; (iv) experiences with front-of-package warning labels; (v) perceptions of the salt and sugar content of packaged foods; (vi) spontaneous recall of food and beverage advertising; and (vii) sociodemographic characteristics and health conditions. The present study focuses exclusively on data collected in modules vi and vii.

In module vi, participants were asked whether they had seen or heard any food or beverage ads during the previous week (Yes/No). Those who responded affirmatively were asked where they had encountered the ad through an open-ended question that was pre-coded for interviewers with the following response categories: television, social media or websites, radio, billboards, and "other." Interviewers were instructed to record verbatim responses provided under the "other" category. Participants who reported

exposure to advertising were also asked an open-ended question about the food or beverage promoted in the ad. Then, all participants were asked to rate the extent to which food and beverage advertising influenced their purchasing decisions using a 5-point Likert scale ranging from 1 (“not at all”) to 5 (“very much”). The questions were developed specifically for the study based on a previous survey about digital marketing [23, 24] .

In the last module, information was collected on gender identity, age, educational attainment, region and neighborhood of residence, household composition, health insurance coverage and self-reported diagnoses of diet-related non-communicable diseases. The wording of the questions of modules vi and vii, in English and Spanish, are included in the Supplementary material.

Data analyses

Responses to the closed-ended question on spontaneous recall of food and beverage advertising were analyzed descriptively by calculating the percentage of participants who reported exposure, both overall and by media type. Logistic regression models were fitted to examine associations between ad recall (overall and by media type) and participants’ sociodemographic and health characteristics. Binary indicators of ad recall were used as dependent variables. Independent variables included gender (male vs. female), age group (18–34 years, 35–59 years, ≥ 60 years), educational attainment (primary education or less, incomplete secondary education, complete secondary education, university degree, postgraduate degree), socioeconomic status (low, medium, high), region of residence (Montevideo vs. rest of the country) and self-reported diagnoses of diet-related health conditions. Health conditions were included as separate binary variables indicating overweight or obesity, hypertension, elevated cholesterol, diabetes and cardiovascular disease.

Responses to the open-ended question regarding the content of recalled ads were analyzed using inductive content analysis [25]. An initial coding framework was developed by one researcher to classify responses into thematic categories. A second researcher independently reviewed the coding framework and proposed minor revisions. Inter-coder agreement was excellent, with Cohen’s kappa values exceeding 0.80 for all categories (M = 0.97, SD = 0.04) [26]. The number and percentage of participants whose responses were assigned to each category were calculated. Higher-order dimensions were subsequently created to group-related categories.

Responses to participants’ perception of the influence of advertising on their purchasing decisions were analyzed descriptively by computing the percentage of use of each scale category, as well as the average and standard deviation of the Likert score. Ordinal logistic regression was used to assess associations between perceived influence of advertising on purchase decisions and participants’ sociodemographic characteristics (gender, age group, educational attainment, socioeconomic status, region of residence, self-reported diagnoses of diet-related health conditions and spontaneous recall of food and beverage advertising).

All data analyses were performed in R software [27]. One participant who reported a gender identity other than male or female was excluded from the regression analyses.

Results

Participant characterization

Table 1 shows the socio-demographic characteristics of participants. As shown, the sample was diverse in terms of all characteristics, including gender, age, education level, socioeconomic status and region of residence.

Spontaneous recall of food and beverage ads

The percentage of participants who reported having seen a food or beverage ad during the week prior to the survey was 50.4% (n = 504). Among these participants, the vast majority (95.4%, n = 481) were able to spontaneously recall at least one ad, whereas only 4.6% (n = 23) were unable to recall any specific food or beverage ad. Overall, 48.1% of the total sample recalled at least one specific food or beverage ad.

Media where ads were seen

Participants who reported having seen a food or beverage advertisement during the week prior to the survey were asked where they had seen it, being allowed to report more than one medium. Most participants (n = 319, 63.3%) identified a single medium, whereas the remainder reported exposure through multiple media channels: two (n = 115, 22.8%), three (n = 36, 7.1%) or four channels (n = 33, 6.5%).

Television was the most frequently cited medium (n = 306, 60.7%), followed by social media or websites (n = 258, 51.2%), billboards (n = 123, 24.4%), and radio (n = 89, 17.6%). Other responses were reported by 13 participants (2.6%) and included supermarkets or other retail stores (n = 3), magazines or newspapers (n = 3), buses (n = 2), and supermarket promotional flyers (n = 1). In addition, two participants responded “everywhere” (n = 2).

Content of the ads

Regarding the content of the ads that participants recalled, beverages were the most frequently mentioned category, particularly sodas, which were cited by more than half of participants who reported recalling an advertisement (58.8%). Other non-alcoholic beverages (e.g., carbonated drinks and juices) were recalled by 12.3% of participants, while alcoholic beverages and energy drinks were mentioned by 5.4% and 2.8%, respectively (Table 2).

Approximately two-fifths of participants mentioned a specific brand (Table 2). In total, 39 different brands were recalled. Coca-Cola was, by far, the most frequently mentioned brand, recalled by nearly

one-third of participants (n = 153, 30.3%). McDonald's (n = 13, 2.6%) was the second most frequently recalled brand, followed by Salus, a Uruguayan beverage brand owned by the French Danone Group (n = 11, 2.2%), Lays (n = 9, 1.8%) and Pepsi (n = 7, 1.4%). Each of the remaining brands was mentioned by fewer than five participants.

Snacks and burgers were the most frequently recalled, each mentioned by approximately one in ten participants (9.5% and 9.3%, respectively). Fast-food ads were recalled by 6.2% of participants. Cold cuts and sausages as well as cookies, crackers and cereal bars were each mentioned by 5.2% of participants each, followed by alfajores (4.0%), generic references to ultra-processed foods (2.6%) and several other categories with lower recall frequency. In contrast, natural or minimally processed foods were recalled by only 1.8% of participants (Table 2).

Links between socio-demographic characteristics and recall of food and beverage ads

Table 3 presents the associations between socio-demographic characteristics, diet-related risk factors and diseases and spontaneous recall of food and beverage ads, overall and by media type. Regarding gender, women showed 66% lower odds of recalling radio ads compared to men, while no statistically significant differences were observed for other media types or overall recall.

With respect to age, participants aged 60 or older had lower odds of recalling any type of ad compared to those aged 18–34 years (OR: 0.61), and notably lower odds of recalling ads on social media or websites (OR: 0.23). Participants aged 35–59 also showed reduced odds of recalling social media or website ads (OR: 0.61) compared to those aged 18-34.

Education level was consistently and positively associated with ad recall across multiple media types. Compared to those with complete primary education or less, participants with incomplete secondary, complete secondary and university-level education all had significantly higher odds of recalling any type of ad (OR: 1.58, 2.11 and 1.98, respectively). These associations were also observed for TV recall among those with incomplete and complete secondary education and were particularly pronounced for social media or website recall as well as radio recall across all education levels, including postgraduate.

Socioeconomic status was not significantly associated with overall recall or most media-specific outcomes, except for medium socioeconomic status, which was associated with higher odds of recalling social media or website ads compared to high socioeconomic status (OR: 1.63). Meanwhile, residing in Montevideo was associated with higher odds of overall ad recall compared to living in other regions of the country (OR: 1.46), though no statistically significant differences were found for specific media types.

Regarding diet-related risk factors and diseases, participants with overweight or obesity had higher odds of recalling any type of ad (OR: 1.47), particularly TV ads (OR: 1.48). Participants with diabetes showed higher odds of recalling TV ads (OR: 1.69), billboard ads (OR: 2.92), and radio ads (OR: 2.03).

Cardiovascular disease was associated with higher odds of billboard recall (OR: 2.45), while hypertension was inversely associated with billboard ad recall (OR: 0.39).

Perceived influence of advertising on purchase decisions

Participants perceived influence of advertising on their purchasing decisions was generally low, with an average score of 2.7 (SD=1.5), which was significantly different than the mid-point of the scale. Most participants answered that advertising did not influence their purchasing decisions at all (35.9%) or only had a minor impact (10.6%), while 22.1% selected the neutral category of the Likert scale. Less than one third (31.4%) of respondents perceived that advertising influenced their purchasing decisions to some extent (12.5%) or a lot (18.9%).

Table 4 presents the results of the ordinal regression analysis. The only predictors that were significantly associated with perceived influence of advertising on purchasing decisions were age and socioeconomic status. Participants aged 35–59, as well as those aged 60 or older had lower odds of perceiving a higher influence of advertising on their purchasing decisions (OR: 0.60 and 0.64, respectively) than those aged 18-34. On the other hand, participants of low socioeconomic status were 58% more likely to perceive a higher influence of advertising on their purchasing decisions compared to those from high socioeconomic status (OR: 1.58).

Discussion

This study examined spontaneous recall of food and beverage ads among Uruguayan adults, as well as their self-perceived susceptibility to advertising influence. To our knowledge, this is one of the few studies to jointly assess ad recall and perceived influence among adults in a Latin American setting, contributing to a literature that has predominantly focused on children and adolescents in WEIRD (Western, Educated, Industrialized, Rich and Democratic) countries [4, 5, 28].

Spontaneous recall of food and beverage ads

Approximately half of the participants reported having seen a food or beverage ad during the week preceding the survey, and almost all of them were able to spontaneously recall at least one specific ad. The proportion of participants who were able to recall a food or beverage ad is noteworthy, particularly considering that spontaneous recall represents a relatively demanding measure of advertising awareness [10, 11]. Recall requires not only exposure but also attention, encoding and retrieval of advertising content from memory [10, 11, 29]. The fact that nearly half of the total sample could identify a specific ad suggests that food and beverage marketing occupies a prominent place within adults' everyday environments. This finding aligns with previous research showing that food marketing is ubiquitous and capable of generating strong memory traces [29–31], even among adults who possess greater cognitive resources and advertising literacy than children and adolescents [28, 32].

Television was the most frequently recalled advertising medium, followed closely by social media and websites. Although digital marketing has received increasing attention in recent years [33–35], the results indicate that television continues to play an important role in reaching Uruguayan adults. At the same time, the high recall of online advertising reflects the growing importance of digital environments for food and beverage promotion. However, recall of ads on social media and websites among Uruguayan adults (51.2%) was substantially lower than that reported in a previous study with Uruguayan adolescents (87.6%) [23]. This difference suggests age-related variations in media consumption patterns, with adolescents spending considerably more time on digital platforms and being more frequently exposed to marketing content in these environments [36]. In addition, the fact that more than one-third of participants reported exposure through multiple media channels further illustrates the integrated nature of contemporary marketing strategies, in which campaigns are designed to reinforce brand messages across diverse platforms.

The content of recalled ads was dominated by fast food and ultra-processed foods and beverages. Soft drinks accounted for the majority of recalled ads, and Coca-Cola was by far the most frequently mentioned brand. Other commonly recalled products included snacks, burgers, fast food, cookies, crackers and processed meat products, whereas natural or minimally processed foods were rarely mentioned, if at all. These findings are consistent with evidence from content analyses conducted in multiple countries, including Uruguay, showing that food marketing is heavily concentrated on products of low nutritional quality [24, 37–44]. The prominence of Coca-Cola in participants' memories may reflect both the intensity of their advertising investments and the cumulative effects of long-term brand-building strategies that maintain high levels of brand salience in consumers' minds. In this regard, the prominence of Coca-Cola in participants' recall is consistent with previous evidence from Uruguay, where it was both the most frequently recalled brand among adolescents when asked about digital food marketing and the most heavily promoted brand outside food outlets in Montevideo [23, 44].

Several socio-demographic differences emerged in relation to ad recall. Younger adults were more likely to recall ads, particularly those appearing on social media and websites, reflecting generational differences in media consumption patterns and digital engagement [45]. Education level was positively associated with recall across several media types, suggesting that greater educational attainment may facilitate attention to, processing of or memory for advertising content [46]. In addition, it may also reflect differential patterns of media use: higher-educated adults tend to be heavier users of digital platforms, where food advertising is increasingly prevalent and algorithmically targeted [45]. Participants residing in Montevideo were also more likely to recall food and beverage ads than those living elsewhere in the country, potentially reflecting higher advertising density, greater exposure to outdoor advertising or differences in media consumption patterns in urban settings [45].

An unexpected finding was the positive association between certain diet-related risk factors and diseases and ad recall. Participants with overweight or obesity were more likely to recall food and beverage ads overall and on television, while participants with diabetes and cardiovascular disease showed higher recall of advertisements on specific media types. Although the cross-sectional nature of

the study precludes causal interpretations, several explanations are possible. Individuals with diet-related health conditions may pay greater attention to food-related information in general, resulting in enhanced recall. In this regard, evidence suggests that individuals with overweight or obesity exhibit heightened attentional responses to rewarding food cues [47, 48], which could partially explain their greater spontaneous recall of food and beverage ads, especially those featuring ultra-processed foods and fast-food products. Alternatively, greater responsiveness to food cues could contribute both to higher recall and to dietary behaviors associated with these conditions. Further research is needed to clarify the mechanisms underlying these associations.

Self-perceived influence of food and beverage advertising

Despite the high levels of recall observed, participants generally perceived that advertising had little influence on their own purchasing decisions. Less than one-third reported that advertising influenced them to a moderate or high extent, while nearly half indicated that it had little-to-no influence. This finding is consistent with the so-called third-person effect, whereby individuals tend to believe that persuasive communications exert stronger effects on others than on themselves [17, 18].

The discrepancy between high ad recall and low perceived influence suggests that adults may underestimate their own susceptibility to food marketing. This may have important implications for public perceptions of the need for marketing regulation. If individuals believe that advertising has little influence on their own behavior, they may be less likely to support mandatory restrictions on the marketing of unhealthy foods and beverages. In turn, limited public support for regulatory measures may contribute to policy inertia and hinder the implementation of effective public health interventions [49, 50]. These findings highlight the need for communication and education campaigns that increase awareness of the ways in which food marketing influences food choices, often through subtle and unconscious mechanisms. Such efforts could help foster a better understanding of the rationale for marketing regulations and strengthen support for policies aimed at protecting both adults and, in particular, children and adolescents from the detrimental effects of unhealthy food marketing.

The socio-demographic predictors of perceived influence differed from those associated with ad recall. Younger adults perceived greater influence of advertising on their purchasing decisions than older adults, whereas participants of lower socioeconomic status reported greater perceived influence than those of higher socioeconomic status. These findings may reflect differences in media literacy, purchasing constraints or attitudes toward advertising. Further research is needed to explore these differences.

Conclusion

The findings of this study indicate that a substantial proportion of Uruguayan adults spontaneously recall food and beverage ads, with recalled content dominated by sugar-sweetened beverages, ultra-processed foods and a small number of globally recognized brands. Ad recall varied according to socio-demographic characteristics, with education, age, gender and region of residence shaping recall patterns

across different media channels. Despite these high levels of recall, most participants perceived advertising as having little influence on their own purchasing decisions, a pattern consistent with previous evidence suggesting that individuals often underestimate their individual susceptibility to persuasive communications. Together, these findings highlight the pervasive reach of unhealthy food marketing among Uruguayan adults and reinforce the need for comprehensive regulatory frameworks that address advertising across both traditional and digital media environments. They also point to the importance of developing communication and media literacy initiatives that increase awareness of the influence of food marketing on consumer behavior, thereby potentially strengthening public support for policy measures aimed at reducing exposure to the marketing of unhealthy foods and beverages.

Declarations

Ethics approval and consent to participate

The study was approved by the ethics committee of the School of Chemistry of Universidad de la República (Protocol 101900-000002-26). Participants provided oral informed consent, which was formally recorded, and the procedures adhered to the guidelines and regulations specified in the Declaration of Helsinki.

Consent for publication

Not applicable

Availability of data and materials

The data generated during the current study are available from the corresponding author on reasonable request

Competing interests

Virginia Natero works at the Ministry of Public Health in Uruguay. All other authors declare no competing interests.

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Authors' contributions

GA and LV contributed to conceptualization, methodology, formal analysis, writing of the original draft, review and editing of the manuscript. TO contributed to conceptualization, methodology, writing of the

original draft, review and editing of the manuscript. All other authors contributed to conceptualization, methodology, and manuscript review and editing.

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Tables

Tables 1 to 4 are available in the supplementary files section

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