



Responsiveness to healthy advertisements in adults: An experiment assessing beyond brand snack selection and the impact of restrained eating



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ABSTRACT

The objective of this study was to explore the impact of different advertising messages on adults' snack choice. Eighty participants (18–24 years old) were offered the choice between two snack packs following exposure to one of three advertising conditions. The snack packs contained either healthy or high fat, sugar or salt (HFSS) foods. Participants were exposed to commercials containing either non-food products, healthy food products or HFSS food products and their subsequent choice of snack pack was recorded. The Dutch Eating Behaviour Questionnaire (DEBQ) was used to assess the impact of external, restrained and emotional eating behaviour on snack pack selection following exposure to advertisements. The majority of unrestrained participants preferentially choose the HFSS snack pack irrespective of advertisement condition. In contrast, high restrained individuals exposed to the healthy eating advertisement condition preferentially selected the healthy snack pack while those in other advertisement conditions refused to take either snack pack. The healthy eating message, when distributed through mass media, resonated with restrained eaters only. Exposure to healthy food adverts provoked restrained eaters into choosing a snack pack; while exposure to other messages results in restrained eaters refusing to take any foods.

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1. Introduction

Television is a powerful method of mass communication and, along with the internet, is the primary vehicle to deliver commercial food and drink advertising to a mass audience (Boyland, Harrold, Kirkham, & Halford, 2011; Kelly et al., 2010). As a result, exposure to food advertisements has been proposed as an important factor in influencing short-term food intake (Boyland et al., 2016). Unsurprisingly, a number of narrative, systematic and meta-analytic reviews have concluded that food advertising leads to a greater preference for, and intake of, the products advertised. What is interesting is that these same advertisements also increase consumption of similar products in the same category. (e.g. Batada, Seitz, Wootan, & Story, 2008; Boyland et al., 2016; Hastings et al.,

2003; Sixsmith & Furnham, 2010). This beyond-brand phenomenon of the television advertisement suggests that when an individual is exposed to commercials it primes the desire to eat all foods within the same category (Bargh, 2006; Halford, Boyland, Hughes, Oliveira, & Dovey, 2007; 2008). Despite regulations to restrict the advertising for HFSS foods in many developed countries, people are still exposed to significantly more advertisements for HFSS foods than products that promote high nutrient or low calorie alternatives (Cairns, Angus, Hastings, & Caraher, 2013). This presents a significant problem for health professionals attempting to instil healthy eating programmes at the population level.

Due to the overwhelming presence of HFSS foods in media advertising, little research has focused on advertising nutritious foods with a healthy eating narrative and how these subsequently impact on the viewers' eating behaviours. Exposure to healthy food advertising results in small effect size increases in habitual fruit and vegetable consumption (Liaukonyte, Rickard, Kaiser, Okrent, & Richards, 2012; Pollard et al., 2008). Two competing perspectives

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have been offered concerning how the change in behaviour following exposure to healthy food advertisements operates. The first perspective suggests a simple manipulation effect, whereby the healthy food advertisement operates by directly increasing positive attitudes towards healthy eating habits within the viewer(s) (Dixon, Scully, Wakefield, White, & Crawford, 2007). The alternative perspective extends from the work of Bruner (1957) and suggests that the healthy advertisement achieves behaviour change through goal directed attention (Brunner, & Siegrist, 2012). Within this socio-cognitive domain, the television advertisement only reaches those people who have already instilled the healthy eating narrative.

The limited data exploring the impact of healthy advertisements appears to support both an attitude change and goal directed attention interpretation. Studies exploring attitude change following exposure to health-related campaigns have found small to moderate effects in line with the changes in diet (Emery et al., 2012). Specific goal-directed motivations following exposure to healthy advertisements have also been observed in children. Children with low levels of food neophobia decrease consumption of the HFSS items at a subsequent snack opportunity, but do not shift to healthier options (Dovey, Taylor, Stow, Boyland, & Halford, 2011). Overall, susceptibility to changes in food intake in children following exposure to media advertisements is known to be dependent on other characteristics such as weight status (Halford et al., 2008) and impulsivity (Folkvard, Anschutz, Nederkoorn, Westerik, & Buijzen, 2014). Similar goal-directed motivated observations in response to television advertisements have not been identified in adults (Anschutz, Engels, Becker, & van Strien, 2009). This has led some authors to conclude that older age groups are not susceptible to changes in eating behaviour following exposure to television advertisements (Boyland et al., 2016). However, when paradigms include food choice (Harris, Bargh, & Brownell, 2009) or offers foods that are similar to those advertised (van Strien, Herman, & Anschutz, 2012) subsequent changes in eating behaviour have been observed in adults.

The measurement of total caloric intake following exposure to food advertisements fails to consider the purpose of the food advertisement. The intention of a food advertisement is to familiarise the viewer with the product and help them better achieve their purchasing objectives (Resnik & Stern, 1977). In children, increased caloric intake following exposure to food advertisements may operate in a similar manner to any other external food cue. This beyond brand effect observed in children (Halford et al., 2007; 2008) may stem from children's lack of understanding about the intention of the food advertisement, leading to a global/category-specific increase in food intake following exposure to television programming (Hastings et al., 2003). In adults who are aware of an advertisements intention, observed changes or reactivity to exposure may only occur when the core advertisement message and the viewer's current goals are aligned (see Bargh, 2006; Papies, 2016 for reviews). Therefore, it is reasonable to suggest that factors such as cognitive restraint, emotional eating and external eating may have a significant role in responsiveness to healthy advertisements.

Focus on the negative impact of food advertisement has negated the potential impact that this medium may have for positive behaviour change. Further investigation regarding the impact of healthy food advertisement on food choice is warranted. The aim of the current paper was to investigate the impact of food advertisements (both healthier and HFSS) on eating behaviour in adults. We hypothesized that participants would be more likely to choose healthy snacks following the congruent food advertisements and are expected to choose HFSS snacks after exposure to HFSS food adverts. A second aim was to investigate the role of individual differences in eating-related characteristics and their interaction

with food advertisements on subsequent food choice. We believed that individual differences as measured by high/low external, restraint and emotional eating status will have an impact on participants' food choice after exposure to advertisements.

2. Method

2.1. Participants

A sample of eighty participants (38 female and 42 male) aged 18–24 years ($M = 20.86$, $SD = 1.33$) were recruited through opportunity sampling around a London university campus and a West London Community Centre. The vast majority of the sample were either staff or students at the university and had a healthy body mass index (BMI) with 63 participants falling into the lean category and 17 in the overweight category ($M = 23.19$, $SD = 3.19$). BMI was not a significant factor in snack pack selection ($\chi^2(3) = 5.23$; $p = 0.12$) and did not interact with the three DEBQ subscales (all $p > 0.1$). Participants were randomly allocated to the three advertisement conditions. Twenty-five participants were exposed to advertisements for HFSS food, 26 participants were exposed to the healthy food advertisements and 29 participants were exposed to non-food advertisements (which did not contain any references to food). The only exclusion criteria for the study were individuals who reported any form of food allergy or subsequently reported not liking any of the foods in either of the snack packs.

3. Materials

The current experiment was given full ethical approval from the Brunel University London School of Life Sciences ethics board. A between-subject design was used in this study, with the dependent variable of 'snack pack choice' used to measure behaviour change. Participants were exposed to one of three advertisement types (HFSS, healthy, or neutral/non-food products). Eating-specific individual differences of restraint, emotional and external eating were assessed through the Dutch Eating Behaviour Questionnaire (DEBQ) and acted as independent variables.

Snack Packs. Participants had a choice of two snack packs at the end of the experiment. One snack pack included nutritious (natural ingredient) food items such as a banana, an organic granola bar and dry fruit raisins. The HFSS snack pack consisted of 5 hero/celebration chocolates, a pack of ready salted Walker's crisps and a chocolate muffin. Previous studies have used snacks to assess food and calorie intake in adults and children following exposure to food advertisements (Halford, Gillespie, Brown, Pontin, & Dovey, 2004; Harris et al., 2009). The composition of products included in the study was determined through pilot testing. It was important that the foods in the healthy snack pack were perceived to be healthy by the potential participants and would constitute a suitable alternative to the HFSS. Although the final selection of the healthy snack packs contained food items that had high glycaemic indices, these were all considered natural food items in the pilot testing phase. In general, the public believe that foods low in fat, sugar and salt are healthy; with fat and/or calories being the principal decision-making criteria for what is considered healthy (Chen, Legrend, & Sloan, 2006; Kang, Jun, & Arendt, 2015). Therefore, the differentiating factor designating the snack pack as healthy or not was based on perceived fat content. The healthy snack pack contained foods low in fat/salt, while the HFSS snack pack comprised of foods high in fat/salt.

Television Stimuli/Advertisements. Eight well known adverts were imbedded into an episode of 'Friends' (VideoPad Video Editor Free version 4.23). The first condition contained advertisements for HFSS and two non-food advertisements these were: Dior J'adore

(The future is Gold advertisement); Pringles (Cancion Anuncio advertisement); Azzaro pour homme (Ian Somerhalder advertisement); and Dairy Milk (Cadbury's Yes Sir I Can Boogie advertisement). The second condition contained advertisements for healthy food and two non-food advertisements these were specifically: Dior J'adore (The future is Gold advertisement); Nakd Bars (Make the Switch- Why Nakd Bars are Good advertisement); Azzaro pour homme (Ian Somerhalder advertisement); and Organic Food Market (Midwest whole foods market commercial: food from a happy place) advertisements. Finally, condition three employed non-food adverts to provide a non-food advertisement control condition. These included: Dior J'adore (The future is Gold advertisement); Easy Jet (Europe by Easyjet advertisement); Azzaro pour homme (Ian Somerhalder advertisement); and Andrex Toilet Roll (The Guide Dog Appeal). The inclusion of the same non-food advertisement at the beginning of each condition prevented participants guessing which condition they were in through an obvious collection of food/neutral advertisements. Advertisements did not promote any of the products within the snack packs. In addition, all conditions contained the same non-food related adverts to simulate a typical commercial break and to mask the purpose of the study. All advertisement segments were embedded into the middle of the Friends episode and lasted for 2 min \pm 10 s depending on condition. The episode lasted for 22 min and was interrupted after 12 min for the commercial break. The delay between the end of the exposure to the television advertisements and snack pack selection was roughly 10 min. Following selection of the snack pack, participants were asked to complete a short questionnaire.

Questionnaires. Participants were initially asked a short series of questions concerning their demographics (e.g. age, sex, known food allergies). Individual differences in eating behaviour were measured with the DEBQ (van Strien, Frijters, Bergers, & Defares, 1986). The DEBQ is a 33-item questionnaire and consists of three sub-scales – external (e.g. If you walk past the baker do you have a desire to buy something delicious?), restrained (e.g. If you have put on weight, do you eat less than you usually do?), and emotional (e.g. Do you have a desire to eat when you are upset?) eating. Participants responded to the items by completing Likert scales that ranged from 1 (seldom) to 5 (very often). Total scores for each subscale were calculated based on average per item responses. The DEBQ has been widely used in appetite research and has high reliability, internal consistency and validity for predicting food intake in a variety of experimental paradigms. In the current study, the mean \pm standard deviation scores for the three DEBQ subscales were: external = 3.4 \pm 0.47, restraint = 2.5 \pm 0.90 and emotional = 2.3 \pm 0.72 eating.

Median split was used to categorise participants as high or low on each of the DEBQ subscales. The median score for the sample on the restraint subscale of the Dutch Eating Behaviour Questionnaire (DEBQ) was 2.4. This led to the sample being split between high ($n = 39$) and low ($n = 41$) restraint scorers. Although sex did not play any significant part in the experimental analysis ($\chi^2(3) = 1.72$; $p = 0.63$), females did report significantly higher restraint scores than males ($t(79) = 3.15$; $p = 0.002$). This led to a slight sex difference in the final group allocation of restraint with females accounting for a higher proportion of the high restraint scoring group (females $n = 24$; males $n = 15$) compared to low scorers (females $n = 14$; males $n = 27$). It was deemed appropriate to measure both males and females in this analysis, as the primary objective was to measure the impact of healthy food adverts on adults' food selection similar to past research (e.g. van Strien et al., 2012).

3.1. Procedure

The general procedure of the study was explained to the

participants on entry and they were encouraged to seek clarification of any component they did not understand. Participants were invited to attend a standard experimental cubicle situated in a university building between 2pm and 4pm on a specific working day at a prearranged and mutually suitable time. All of the participants reported eating lunch prior to attending their session and were not hungry. All participants were tested in isolation in a quiet room free from external disturbances. The two snack packs were situated behind them and were in the environment throughout the test. All testing took place between December 2014 and March 2015.

To avoid bias, participants were informed that they were to take part in a pilot study to assess the suitability of a television program to alter their mood. All participants were then informed that they were placed in the 'comedy' condition whereby they would be required to watch a well-known episode of 'Friends'. Participants then completed a consent form. Following viewing of the television episode, participants were asked for their opinions on the program and offered the choice of a 'thank you' snack pack. Participants were informed that the packs were left over from a conference held on site this morning and were made fresh that day. The snack packs were presented in labelled crates with their contents listed on the front and each pack was in clear resealable sandwich bag. Once the participants had made their selection, they were asked to complete the questionnaires. At the end of the questionnaires, participants were debriefed revealing the true aim of the experiment.

4. Results

The overall multinomial logistic regression model for predicting snack pack selection (chose the healthy snacks, the HFSS snacks, took both snacks, or refused to take any snack pack) by exposure to different advertisement types (non-food, high fat/sugar, healthy) and sample differentiation by restraint status (high/low) was significant ($\chi^2(15) = 31.25$; $p = 0.008$). This result was confirmed by the Pearson ($\chi^2(6) = 8.093$; $p = 0.23$) and Deviance ($\chi^2(6) = 9.95$; $p = 0.13$) 'goodness of fit' tests. This difference was caused by the high restrained individuals preferentially selecting the healthy snack pack following the healthy advertisements ($B = -2.93$, $\text{Exp}(B) = 0.54$, 95% CI 0.004–0.64, $p = 0.02$) and tended to refuse both snack packs following other conditions. Low restrained individuals, irrespective of advert condition, tended to take the HFSS snack pack ($B = 1.44$, $\text{Exp}(B) = 4.23$, 95% CI 1.18–15.22, $p = 0.027$) or took both snack packs ($B = 1.68$, $\text{Exp}(B) = 5.35$, 95% CI 1.18–24.75, $p = 0.032$).

In order to follow up on the eating behaviour attributes of restrained, emotional and external eating, a Welch's one-way analysis of variance was employed. This analytic procedure was adopted due to violations in homogeneity of variance. Assessment of the impact of the subscales of the DEBQ revealed that only differences between high/low restrained scores were significant. Therefore, emotional ($F(3,79) = 1.61$; $p = 0.19$; $\eta^2 = 0.17$) and external ($F(3,79) = 1.11$; $p = 0.34$; $\eta^2 = 0.04$) eating were not considered further. There was a significant difference in restraint score based on the snack pack selection (Welch's $F(3,38) = 4.73$; $p = 0.007$). This difference was due to individuals who refused to take either snack pack being significantly more restrained than those who selected the HFSS snack pack ($p = 0.007$) or both ($p = 0.018$). The mean restraint scores for the participants who took the different snack selections were: both snacks (mean = 2.05 \pm standard deviation 0.52); High fat/sugar (2.11 \pm 0.58); healthy (2.56 \pm 0.95); refusal to take either snack pack (3.01 \pm 1.08).

5. Discussion

The focus of this study concerned the interaction between food choice (healthy or HFSS snack pack, or no snack pack) and food advertisement exposure (i.e., healthy/HFSS food ads). We hypothesized that participants were more likely to choose healthy snacks following the healthy food adverts and to choose HFSS snacks after exposure to HFSS food adverts. This hypothesis was only partially supported. Participants snack pack selection altered after exposure to different advertisements and was influenced by their restrained status. For the majority of participants, there was an increased likelihood that they would choose HFSS snack pack irrespective of advertisements they were exposed to. Therefore, when given an option of a free snack pack, the majority of participants tended to prefer to follow their hedonic food choice. The data here does not contradict that of van Strien et al. (2012). Within the current paradigm, food choice was the dependent variable. In van Strien's study, total caloric intake operated as the measured variable. Both findings can co-exist with external eaters eating more in response to concurrent HFSS food advertising and restrained eaters' subsequent food choice can alter in response to healthy advertisements. The fact that past research and the current data have found multiple modes of action, suggests that television advertisements can operate on multiple levels indicative of a complex stimulus. It was also hypothesized that external, restrained and emotional eating will have an impact on participants' food choice after being exposed to food advertisements. Consistent with our hypothesis, high restraint status led to selecting the healthy snack pack following exposure to healthy advertisements.

Previous research has indicated two competing perspectives on the responsiveness to healthy advertisements may exist, either 1) healthy advertisements provide a defence against over consuming HFSS foods (Lemnitzer, Jeffery, Hess, Hickey, & Stroud, 1979; Scammon & Christopher, 1981) or 2) healthy advertisement is ineffective (Goldberg & Gorn, 1979; Goldberg, Gorn, & Gibson, 1978; Lemnitzer et al., 1979). The data collected here appear to support that healthy food advertisements have a limited impact on the general population's food choice when measured in isolation. Responsiveness to healthy food advertisements in adults was only observed in restrained individuals. This may explain the null results and small effects observed in previous healthy advertisement studies (Liaukonyte et al., 2012; Pollard et al., 2008). This novel finding offers some additional complexity underlying the impact of healthy food advertisements. Although the intention of the healthy food advertisement was to alter food choice in the viewer, these data suggest that it only appeals to those for whom the advertisement message is salient (Bargh, 2006). This finding mirrors those of Fishbach, Friedman, and Kruglanski (2003), who suggested that goal congruent diet-relevant cues in individuals concerned about dieting increased selection of healthy foods. Restrained individuals are by definition either engaging in dieting or are attempting to weight maintain (Witt, Ketterman, & Lowe, 2013). The message portrayed in the healthy food advertisement appears to resonate with the restrained eater and alters their habitual food choice. The habitual choice of restrained individuals was to decline to take either healthy or HFSS snack pack. The implication of this result would be that the healthy food advertisement stimulates food choice in high restrained individuals and may constitute a net increase in food intake. This was the first study to uncover the responsiveness of adults to healthy food advertisements. Therefore, there are some limitations that need to be highlighted prior to offering definitive conclusions. In order to hide the nature of the study from the participants, in line with similar studies on adults, a between-subject design was implemented. Future studies may wish to build on this finding by specifically exploring the impact of

healthy food advertisements on restrained individuals through more subtle methods or specific inclusion criteria. Specifically, it is important to understand how the restrained eater is primed by the healthy advertisement message. Analysis of paired word associations will likely reveal if the healthy message is specifically primed or is indirectly primed as an associated triggering the restrained process. To ensure that the healthy message is primed by restrained eating it would be worth replicating this finding by recruiting individuals who score in the top quartile on this DEBQ subscale rather than splitting the sample based on median scores, as well as in a widest possible range of ages.

Another key limitation of the field, as well as the study, was the need to consider the perception of the healthy, rather than considering a snack pack that is nutritionally balanced. It would appear that the perception of what is healthy is complex and the general public consider a variety of factors when ascribing the term 'healthy' to a product (Tudoran, Olsen, & Dopico, 2009). The definition of the term healthy may have specific resonance with the rule governed behaviour of restraint. Additional conceptualisations of 'healthy' food exploring other nutrient targets (e.g. low in sugar) may uncover different outcomes. The robustness of the impact of restraint on responsiveness to healthy food advertisements merits further testing. Based on this limitation, it cannot be concluded that there is not a complex tridirectional relationship between advert type, restraint status and the food offered.

The final limitation of the findings was that food in this paradigm was free. Usually, the advertisement intends to make the viewer buy the product. This component of the process was not considered within the current paradigm as it was not the integral to the hypothesis. It would be expected that the impact of a single advertisement episode on food choice would be further limited if the participant was offered a choice of items to purchase. However, the impact of paying for food items would need to be substantiated in further research before definitive conclusions concerning the impact of healthy advertisements can be fully understood. It is not possible to conclude from these data if other multimedia messages or media would have a similar effect of television advertisements. It would be of value to explore the similarities and differences between all screen based advertisements to fully understand the generalisation of our findings to other platforms.

Despite the limitations noted, this study has significant strengths that provide additional insight into the impact of advertisements on adults. What the paradigm loses in sensitivity, it allows for a more valid measure of the impact of an advertisement. By expressly measuring food choice rather than food intake, allows for an assessment of the impact of the advertisement that reflects its intention. Although total caloric intake or food choices in an ad libitum snack are valid dependent variables, food choice provides insight about how the participant responds to the advertisement directly. Moreover, food choice allows for more direct attributes between exposure to the food advertisement and subsequent behaviour.

To conclude, responsiveness to healthy food advertisements in adults appears to be complex. Healthy food advertisements appear to elicit a behavioural response in restrained eaters only. Exposure to the healthy messages resonated with the restrained eaters and made them select healthier foods when ordinarily they would refuse to take a snack.

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