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The persuasive effect of advergames promoting unhealthy foods among children: A meta-analysis

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ABSTRACT

Multiple studies have examined the effects of advergames promoting unhealthy foods on eating behavior among children. Although the individual results of the existing studies suggest that advergames have a significant influence on (predictors of) eating behavior, a lack of clarity concerning the size of the effect may impede policy actions. Therefore, a meta-analysis was conducted to examine the strength of the effect of playing advergames that promote unhealthy foods on (predictors of) eating behavior among children. Five electronic databases were searched for relevant publications (Web of Science, PsychInfo, Pubmed, JSTOR, and SCOPUS). Fifteen articles were considered eligible for inclusion and analyzed in the meta-analysis. Employing a random-effects model to estimate the composite effect of advergames yielded a small-to-moderate and significant effect of $g = 0.30$. Results showed that advergames promoting unhealthy foods induced unhealthy eating behavior among children. Although only a limited number of studies were included, this meta-analysis supports public health policy action that seeks to reduce children's exposure to unhealthy digital food marketing. Stricter regulation to protect children against new forms of (online) marketing techniques that promote unhealthy foods should be developed and implemented.

1. Introduction

A number of systematic research reviews into the extent, nature and effects of food advertising directed at children conclude that advertising is extensive and widespread, and that it has a significant effect on unhealthy eating behavior (Boyland & Halford, 2013; Boyland et al., 2016; Cairns, Angus, & Hastings, 2013; Folkvord, Anschütz, Boyland, Kelly, & Buijzen, 2016; Harris, Pomeranz, Lobstein, & Brownell, 2009). Currently, food advertising almost entirely promotes high-fat, -sugar, and -salt foods (Boyland et al., 2016; Kelly et al., 2010; Powell, Schermbeck, Szczypka, Chaloupka, & Braunschweig, 2011) and is very effective in influencing children's food choices (Boyland et al., 2016; Folkvord et al., 2016). Regulations with regard to (digital) food marketing to children differ between countries (Kelly et al., 2010; Lupiáñez-Villanueva et al., 2016), where some countries have no regulations, self-regulation, co-regulations, or statutory regulations. However, there is convincing evidence that marketing policies are effective in reducing the consumption of unhealthy foods (Kovic, Noel, Ungemack, & Burleson, 2018).

Most of the studies on food advertising targeted at children have focused on traditional media forms, with only limited attention for newer forms of food advertising, like online food marketing (Buijzen, Owen, & Van Reijmersdal, 2010; Cairns, Angus, Hastings, & Caraher, 2013; Folkvord et al., 2016; Rifon et al., 2014). However, advertisements for snack products are increasingly embedded in a variety of media messages, aiming to create positive associations with particular brands and products. Importantly, it has been suggested that the effects of these newer forms of food advertising are stronger than more traditional forms (Buijzen, van Reijmersdal, & Owen, 2010; Folkvord et al., 2016). In the present study, we conducted a meta-analysis to investigate the effects of so-called 'advergames' on (predictors) of snacking behavior.

A recent Ofcom (2017) report suggests that the use of the internet is increasing rapidly among children and surpasses television watching time. Food marketers have adapted to this trend and are using newer advertising techniques to advertise their brands and products. Advergames constitute one relatively new marketing tool, that has been designed in particular for children (Nairn & Hang, 2012). Advergames are

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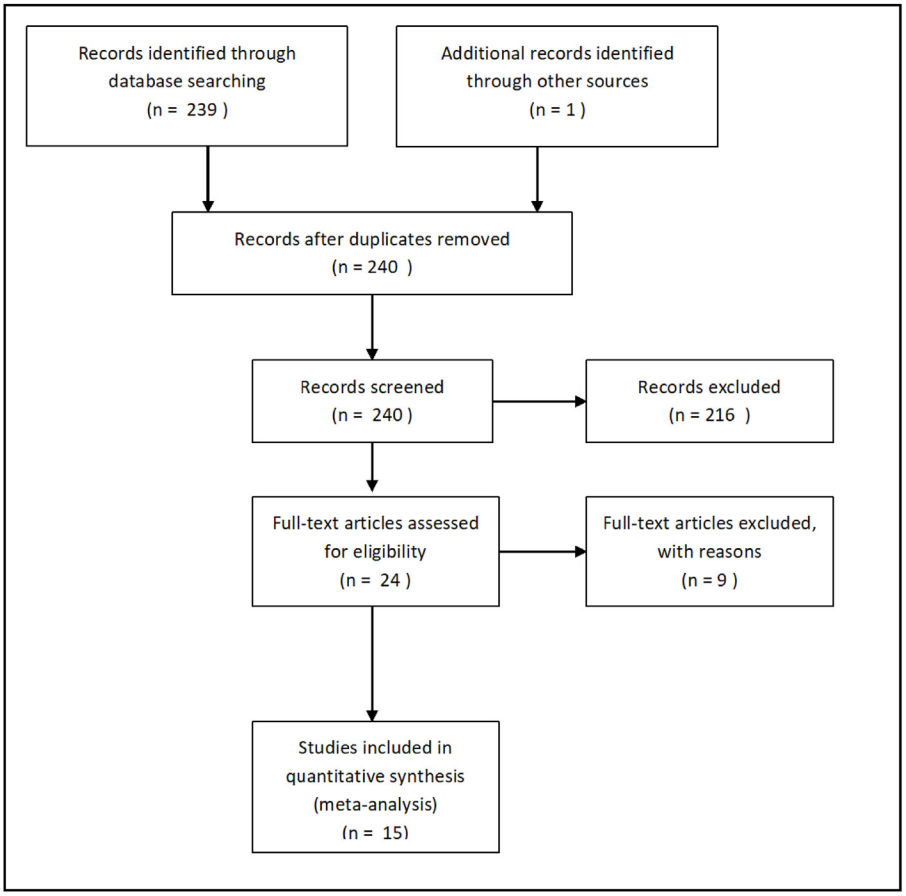

Fig. 1. PRISMA flow diagram.

a form of online advertising that features messages, logos, and trade characters in a video game format (Mallinckrodt & Mizerski, 2007). Advergames contain typical video game features such as the possibility to play multiple levels and create personal avatars - all in an attempt to make children return to company's or the brand's website and play the game multiple times (Nairn & Hang, 2012). As such, they are designed and function in such a way as to be playful and involving, with brand immersion as the main objective of the advergames (Nairn & Hang, 2012).

As a consequence, it is more difficult for children to recognize the persuasive purpose of the game than in traditional forms of advertising. Therefore, children are often not able to activate any skepticism about the source of the message embedded in the game (Buijzen et al., 2010; Folkvord et al., 2016; Nairn & Hang, 2012). In fact, one of the reasons advertisers consider children as an important target market, is precisely the fact that they are more susceptible to advertising than adults due to a still developing literacy in advertising effects.

Research shows that 97% of all food and beverage advergames contain at least one food cue that is considered as a brand identifier, such as a food or package image, a brand character, or a company/brand logo (Culp, Bell, & Cassady, 2010; Moore, 2006). Food cues are firmly integrated into the content of the advergame, making it difficult for children to recognize the persuasive intent of the advertisement and possibly affecting them more strongly (Buijzen et al., 2010; Folkvord et al., 2016). Just as in food advertisements on television, the majority of food-advertising advergames contain cues of food that contain high levels of sugar, salt, and/or fat; advergames promote specific types of candy, cereals, soft drinks, or salty snacks (Lee, Choi, Quilliam, & Cole, 2009).

1.1. Previous findings

There is a growing body of experimental research that explores the direct effects of unhealthy food advertising in advergames on food intake among children (Boyland et al., 2016). Several studies have indicated that, compared to control conditions (nonfood advergames or no advergames), children who play advergames that promote food eat more energy-dense snacks (Folkvord et al., 2016; Harris, Speers, Schwartz, & Brownell, 2012). Drawing conclusions from calculations based on (mixed) effect sizes is a better estimation of the strength of the effect than using p-values (Halsey, Curran-Everett, Vowler, & Drummond, 2015). Therefore, this meta-analyses of experimental studies will test the effect of advergames promoting food on (predictors of) eating behavior amongst children aged 5–17 years.

One previous meta-analytic study investigated the effects of food advertising on eating behavior (Boyland et al., 2016), and showed that acute exposure to food advertising increased food intake among children. In the present study, we aim to contribute to the literature by updating previous work (Boyland et al., 2016) and focusing not only on eating behavior per se, but also on indirect predictors of eating behavior, like intention, preference, and demand for advertising food products, that have been shown to be important factors that are related to eating behavior (Kelly, Vandevijvere, Freeman, & Jenkin, 2015; Ng et al., 2015). By including a wider range of outcome measures, the present study is able to include and analyze a much larger number of studies than previous work (Boyland et al., 2016).