



Encouraging children to eat more fruit and vegetables: Health vs. descriptive social norm-based messages



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ARTICLE INFO

Article history:

Received 29 September 2015

Received in revised form

21 January 2016

Accepted 23 January 2016

Available online 26 January 2016

Keywords:

Social eating

Social norm messages

Social norms

Fruit and vegetable intake

Perceived eating norms

ABSTRACT

Traditional intervention approaches to promote fruit and vegetable consumption outline the health benefits of eating fruit and vegetables. More recently, social norm-based messages describing the healthy eating habits of others have been shown to increase fruit and vegetable intake in adults. Here we report two experimental studies which investigated whether exposure to descriptive social norm-based messages about the behaviour of other children and health-based messages increased fruit and vegetable intake in young children. In both studies children were exposed to messages whilst playing a board-game. After exposure to the messages, children were able to consume fruit and vegetables, as well as high calorie snack foods. Although findings were inconsistent across the two individual studies, in a pooled analysis we found evidence that both health messages and descriptive social norm-based messages increased children's fruit and vegetable intake, relative to control condition messages ($p < .05$). Whether descriptive social norm-based messages can be used to promote meaningful changes to children's dietary behaviour warrants further study.

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1. Introduction

High fruit and vegetable consumption is associated with a reduced risk of major chronic diseases (Bazzano et al., 2002; Hung et al., 2004), however, children eat less fruit and vegetables than recommended (Dennison, Rockwell, & Baker, 1998; Yngve et al., 2005). Eating behaviours are believed to develop through social learning during childhood (Birch & Fisher, 1998; Birch, Savage, & Ventura, 2007), with the presence of dining companions, such as parents, peers and siblings influencing the development of food preferences and eating behaviours (Birch & Fisher, 1998; Birch et al., 2007; Sharps et al., 2015). Eating behaviours developed during childhood also track into adolescence and adulthood (Kelder, Perry, Klepp, & Lytle, 1994; Singer, Moore, Garrahe, & Ellison, 1995), therefore, understanding how we can encourage children to acquire healthy eating habits is important.

Traditional intervention approaches to encourage fruit and vegetable intake outline the health benefits of eating fruit and vegetables. However, the effectiveness of this approach is unclear. Some studies support that health messages can motivate

healthier food choices in adults and children (Bannon & Schwartz, 2006; Lawatsch, 1990; Robinson, Harris, Thomas, Aveyard, & Higgs, 2013). For example, in one study, exposure to nutrition messages about apples in a video influenced children to choose an apple rather than a cracker (Bannon & Schwartz, 2006). Likewise, exposing adults to information suggesting that limiting junk food consumption can be beneficial to health, reduced junk food consumption relative to a control condition in a recent study (Robinson, Harris, et al., 2013). However, there are also studies which suggest that, in some contexts, health messages may not be an effective way to increase fruit and vegetable intake (Maimaran & Fishbach, 2014; Musher-Eizenman et al., 2011; Wardle & Huon, 2000). For example, Maimaran and Fishbach (2014) showed that presenting food as instrumental to achieving a goal, for example, outlining the health benefits of eating certain foods, decreased consumption in pre-school children. This may be explained by a form of boomerang effect (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007; Werle & Cuny, 2012), whereby increasing the perceived healthfulness of a food reduces consumption. This is also in fitting with suggestions that when a person believes a food is 'healthy' it will be less appealing and enjoyable to eat (Raghunathan, Naylor, & Hoyer, 2006).

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Although there is mixed evidence regarding the effectiveness of health messages, a significant body of research indicates that eating behaviour can be socially influenced. Adults and children have been shown to adjust their food intake to that of a present peer (Bevelander, Anschütz, & Engels, 2012; Feeney, Polivy, Pliner, & Sullivan, 2011; Robinson & Higgs, 2012). There is also consistent evidence that adults adjust their food intake based on their beliefs about the eating behaviour of others (Pliner & Mann, 2004; Robinson, Sharps, Price, & Dallas, 2014; Robinson, Thomas, Aveyard, & Higgs, 2014; Sharps & Robinson, 2015). The role that beliefs about others' eating behaviour have on eating behaviour has been less thoroughly examined in children. However, in a recent study children were exposed to information suggesting that other children taking part in the study had been eating a large amount of vegetables, and this resulted in children increasing their own vegetable intake (Sharps & Robinson, 2015). Growing evidence suggests that it may be possible to promote healthier eating behaviour in adults through the use of descriptive social norm-based messages. Descriptive social norm-based messages are messages which highlight the healthy eating behaviour of others, and have been shown to influence food intake in adults and adolescents (Robinson, Fleming, & Higgs, 2013; Robinson, Harris, et al., 2013; Stok, De Ridder, De Vet, & De Wit, 2014). For example, Robinson, Fleming, et al. (2013) found that exposure to a descriptive social norm-based message suggesting that other young adults frequently ate fruit and vegetables, influenced young adults to increase their intake of fruit and vegetables relative to a health message about the benefits of fruit and vegetable consumption. However, there is some evidence that descriptive social norm-based messages may not always be effective in increasing fruit intake (Stok, de Ridder, de Vet, & de Wit, 2012), whilst in other studies, descriptive social norm-based messages have been shown to be no more effective than a health message (Robinson, Harris, et al., 2013) or an instructive message (e.g. have a salad) (Mollen, Rimal, Ruiters, & Kok, 2013). The effect that descriptive social norm-based messages have on the eating behaviour of children has not been investigated. Given that descriptive social normative information (e.g. an information sheet showing the intake of the previous children) has been shown to influence vegetable consumption in young children in a previous study (Sharps & Robinson, 2015), it is plausible that descriptive social norm-based messages about children's fruit and vegetable consumption could be an effective way of encouraging children to 'fit in' and eat more fruit and vegetables.

The present studies tested the effect of messages outlining the health benefits of eating fruit and vegetables, and descriptive social norm-based messages suggesting that other children eat fruit and vegetables, on consumption of fruit and vegetables in children aged 6–11 years old. We focused on this age range as previous studies have shown that children of this age are socially influenced by their peers when eating (Bevelander et al., 2012; Romero, Epstein, & Salvy, 2009) and conform to descriptive social norms about food intake (Sharps & Robinson, 2015). Across two studies we exposed children to messages about fruit and vegetables as part of an interactive board-game. In line with previous studies in adults, we predicted that children exposed to descriptive social norm-based messages would increase their intake of fruit and vegetables relative to participants in a control condition. Because of inconsistent findings concerning the effect that health messages have on eating behaviour (Bannon & Schwartz, 2006; Lawatsch, 1990; Maimaran & Fishbach, 2014; Robinson, Harris, et al., 2013), we reasoned that health messages may only have a modest influence on fruit and vegetable consumption.

2. Study 1

2.1. Method

2.1.1. Participants

143 children (60% females) aged 6–11 years old, ($M = 8.75$ ($SD \pm 1.04$)) were recruited from two Primary schools in North-West England. The sample consisted of 93 healthy-weight and 50 overweight children. Participants were led to believe that the study was looking at how people play board games, and were randomly assigned to one of three conditions; descriptive social norm-based message vs. health message vs. control. In both studies we aimed to recruit at least 40 children per experimental condition. In recent work we have conducted examining social norms and children's vegetable consumption we identified a statistically large effect size (Sharps & Robinson, 2015). Therefore, a sample size of 40 children per condition provided more than adequate statistical power to detect a similar sized effect. The study was approved by the University of Liverpool Research Ethics Committee. Fully-informed parental consent was provided.

2.1.2. Procedure

Study sessions took place during week days between 9am and 3.30pm in UK primary schools. First, the researcher informed the child that the research was about the different ways in which children play games, and the child was seated next to the researcher in front of a board-game. The researcher explained the aim of the game; to move around the board, collect cards and reach the end. Both the child and the researcher had a pack of cards which contained a number and were used to move around the board. Movement around the board was identical in each condition. The child always started first and always won the game. As the child and the researcher moved around the board, they landed on three spaces where they selected a message card. Children's cards contained a message, while the researchers' cards contained an image (fruit and vegetables in the descriptive social norm-based and health message conditions, or animals in the control condition). On selecting a card, the child was required to read the message aloud and explain their interpretation to the researcher. At the end of the game the child was required to explain to the researcher what they had learned during the game, and recited the messages to ensure the researcher knew that the child understood the messages. All children were able to correctly describe the meaning of the messages. The game took approximately 7 min.

Next, the child was informed that there would be a short break before the next game, and the child was presented with the tray of snack foods. The child was informed that they could eat as much of the snack foods as they wished, and was left alone for 7 min. Following the 'break', the researcher returned and presented the child with a second game, which involved sorting pictures of fruit and vegetables (e.g. an image of carrots) and high calorie snack foods (e.g. an image of crisps) into one of two piles; fruit and vegetables or sweets and crisps. This enabled the researcher to identify that all children knew what fruit and vegetables were.¹ Finally, the researcher asked the child what they thought the aims of the study were, completed the questionnaire measures with the child, and measured the child's height and weight.

2.1.3. Messages

Participants were randomly assigned to play one of three board-games. One board contained images of fruit and vegetables, which was used in the descriptive social norm-based message and health

¹ All children were able to correctly categorise the fruit and vegetable pictures.

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