



## Social cognitions about food choice in children aged five to eight years: Feasibility and predictive validity of an age appropriate measurement



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### ABSTRACT

There are currently no instruments available to measure social cognitions towards food choice in children. This study aimed to test the feasibility and predictive validity of a novel measurement tool to assess food-related social cognitions.

Sixty-eight children, five to eight years old, were asked to sort cards with photographs of four fruit and four sweet/savoury snacks as a mean to measure attitudes, subjective norms, perceived behavioural control (PBC), and intention. Subsequently, food choice (dependent variable) was assessed using a laboratory food choice task in which children could gain access to sweet and savoury or fruit items, or a combination.

All participants completed the tasks successfully, demonstrating feasibility of the procedure. The order in which the cards were sorted for each construct differed sufficiently and correlations between constructs were in line with previous studies. Measures of PBC, intention, attitude, and subjective norm from the mother, but not from teachers or friends, correlated significantly with subsequent food choice.

It is possible to measure food-related social cognitions in children aged five to eight and these measures were predictive of observed behaviour. The new instrument can contribute to our understanding of psychological determinants of food choice in young children.

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Excess dietary energy intake and consequent increases in prevalence of obesity in children are major public health concerns (Ebbeling, Pawlak, & Ludwig, 2002; Wang & Lobstein, 2006). Food intake can be conceptualised as a range of behavioural choices between more and less healthy options. The consumption of energy-dense, nutrient-poor snacks has increased considerably over the past decades (Larson & Story, 2013). While there is good evidence that regular intake of fruit and vegetables as ‘healthy snacks’ reduces the risk of non-communicable diseases (Boeing et al., 2012; He, Nowson, & MacGregor, 2006; Vainio & Weiderpass, 2006; WHO, 2002), many children are not meeting

recommended guidelines for fruit and vegetable intake (Bates, Lennox, Prentice, Bates, & Swan, 2011; Vereecken, Ojala, & Jordan, 2004). For example, a national survey of Portuguese children under 10 years found that only 2% consumed fruit every day, while more than 90% consumed salty snacks or sweets on four days of the week (Rito, Paixão, Carvalho, & Ramos, 2010).

Childhood is an important stage in the development of food preferences and eating behaviours and these often track into adulthood (Craigie, Lake, Kelly, Adamson, & Mathers, 2011). There is limited knowledge about modifiable correlates of children’s food intake. Previous research has identified a range of environmental and educational factors (Van Der Horst et al., 2007) as well as social cognitions such as perceived modelling, dietary intentions, norms, liking and preferences (McClain, Chappuis, Nguyen-Rodriguez, Yaroch, & Spruijt-Metz, 2009) associated with children’s dietary intake behaviours and food choice.

Exploring the influence of social cognitions on behaviour has

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proved useful in improving intervention programmes for older children (Araújo-Soares, McIntyre, & Sniehotta, 2009). One approach which has been used to conceptualise and measure children's social cognitions regarding food intake is the Reasoned Action Approach (RAA; Fishbein & Ajzen, 2010; based on theories of planned behaviour and reasoned action). The RAA hypothesises that intentions and perceived behavioural control (PBC) are the main direct predictors of behaviour. In turn, intentions are hypothesised to be a function of three main underlying constructs: 1) attitudes toward behaviour, i.e., behavioural beliefs about positive or negative consequences of performing the behaviour; 2) subjective norm, i.e., normative beliefs about the approval/disapproval of relevant others; and 3) PBC, i.e., control beliefs about barriers and facilitators. The RAA assumes contextual factors can influence behaviour through perceived control and intention. There is an ongoing debate about the role of RAA and similar models as theories of human behaviour (Ajzen, Brown, & Carvajal, 2004; Ogden, 2003; Sniehotta, Pesseau, & Araujo-Soares, 2014, 2015). Most of the critique focuses on the causal assumptions, but there is little disagreement that RAA measures are generally good and potentially modifiable predictors of behaviour (McEachan, Conner, Taylor, & Lawton, 2011).

Relationships between RAA social cognitions and eating behaviours have been studied in children and adolescents (Bazillier, Verhaci, Mallet, & Rouëssé, 2011; Berg, Jonsson, & Conner, 2000; Conner, Martin, Silverdale, & Grogan, 1996; Fila & Smith, 2006; Hewitt & Stephens, 2007; Lien, Lytle, & Komro, 2002). Intentions and PBC of eating were consistently found to be predictive of eating behaviour (Berg et al., 2000; Hewitt & Stephens, 2007). To our knowledge the youngest sample in which the relationship between children's RAA social cognitions and eating behaviours was investigated among children aged eight to nine years (Bazillier et al., 2011). Research in younger children's (under eight/nine years old) health behaviours has mostly focused on parental reports and environmental influences (e.g. Dennison & Edmunds, 2008; Halford, Boyland, Hughes, Oliveira, & Dovey, 2007; Kröller & Warschburger, 2008; Wardle, Carnell, & Cooke, 2005). The absence of studies exploring eating behaviour-specific social cognitions in children under eight years old may be due to conventional assessment of social cognitions using Likert scales, which have been found to be poorly understood by younger children (Rhodes, Macdonald, & McKay, 2006). An age-appropriate measurement tool for younger children is desirable to investigate social cognitive alongside parental and environmental influences on food choice.

Children as young as four develop problem solving skills and start making choices, improving autonomy from their primary carers (Erikson, 1950; Mogharreban & Nahikian-Nelms, 1996). Young children are aware of the different types of food available in distinct contexts of their lives (e.g. school or home) and their preferences are influenced by the access permitted by their parents. Understanding children's cognitions and their relationship with food choice could potentially inform the development of effective interventions to support healthy eating choices; be useful in the process evaluation of interventions; or explain differential responses of children to interventions. This illustrates the importance of using a new tool that will allow the assessment of young children's food choice determinants.

A recent study by Araújo-Soares, Sniehotta, Laing, Gellert, Jackson, and Speakman (2015) measured physical activity and social cognitions related to physical activity in a sample of four to six year-olds with a newly developed measurement tool. Children were introduced to four physical activities and four sedentary activities. Eight photographic cards displaying these activities were presented to each child sequentially. They were asked to sort the

cards (by removing a card at a time) into ascending order of preference for: 1) liking (attitudes), 2) perceptions on what others would prefer them to choose (subjective norms relating to friends, parents, and teachers), 3) ease of performance (PBC), and 4) intentions to engage in both types of activities. The novel measurement tool was found to be feasible in young children and predictive of objectively measured physical activity cross-sectionally and prospectively over six months. Measures of cognitions presented good retest-reliability and good discriminant and predictive validity (Araujo-Soares et al., 2015).

The aim of the present study was to test the feasibility and the predictive validity of a new measurement tool developed to assess social cognitions for food choice in young children aged five to eight years (adapted from Araujo-Soares et al., 2015). Two research questions were explored: a) can social cognitions about food be measured in young children using this tool? b) are measured social cognitions in young children related to each other and to behaviour as expected by theoretical assumptions?

It was expected that attitudes, social norms and PBC would be associated with intentions and that intentions and PBC would be directly associated with behaviour.

## 1. Methods

### 1.1. Participants and procedure

A total of 68 children (63.2% girls) aged five to eight years participated in this study.<sup>1</sup> The sample was recruited from a nursery and an out-of-hours children's club in the north of Portugal. In order to include normal weight, overweight and obese children, participants were also recruited from a paediatric obesity department, in a central hospital in Portugal.

The study received ethical approval from the university and from the ethical board of the hospital. Afterwards, all parents of children aged five to eight years old included in the sample were contacted. Parent information leaflets and consent forms were sent home. After written parental consent was provided, verbal assent from the child was obtained and the social cognitions assessment was conducted with each child individually in a room allocated specifically for the study. The assessment was conducted after meal time in order to control for appetite levels. The protocol was divided in four consecutive sections: 1) initial baseline measurements (age, sex, height, weight); 2) familiarity assessment of each snack; 3) ranking of social cognitive variables; 4) food choice task (measure of actual behavioural choice). These measures and procedures will be detailed below.

### 1.2. Measures

#### 1.2.1. Biometric measure

Height was measured to 0.1 cm with the same tape measure and weight measured to 0.1 kg with the same scales. Sex and age were also recorded to calculate the BMI-percentile using the 'child and teen calculator' provided by the Center for Disease Control and Prevention (CDC, 2010). Sex, age, and BMI-percentile were subsequently included as covariates.

#### 1.2.2. Social cognitions assessment for children

The measures were adapted from Araújo-Soares et al. (2015) to assess social cognitions related to food choice in young children. The approach is based on choices between popular healthy and

<sup>1</sup> In the Portuguese educational system, children first enter school if their 6th birthday occurs until the month of September of that school year.

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