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Research challenges and methods to study food preferences in school-aged children: A review of the last 15 years

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ABSTRACT

Until only a few decades ago, there was little interest in research about children as consumers. Today, the food market for "the small consumers" is continuously growing and many foods and beverages are developed specifically for this target group. Furthermore, a better understanding of children's food preferences could help design strategies to reduce obesity and malnutrition. The present review examines the main research domains in which measurements of children's food preferences are applied. It also gives an overview of the progress made during the last 15 years in the field of consumer testing with children, highlighting the need of investigating and using new methods in addition to existing ones. Attention is devoted to the choice of specific methods according to the child's age.

An intense interest in consumer and sensory research with children is demonstrated by the systematic increase of scientific publications on this topic. A shift in research methodology has been observed in the last 15 years, being research more focused on feeding behavior and healthy eating. Recent investigations confirm that children in the age range of 4–11 years are able to perform most traditional consumer tests in addition to more sophisticated methods (e.g. projective mapping, memory and emotion evaluation) if age-appropriate procedures are adopted.

Contents

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1. Introduction

Traditionally, there has been relatively little interest in children's food preferences. However, considering that food market for children is continuously growing, a wide variety of foods and beverages has been developed for this younger target group. In fact, children greatly influence purchases or even buy food themselves, and accordingly, the interest of food companies towards children in product development programs seems justified (Laureati, Pagliarini, Mojet, & Köster, 2011). Developing products for children requires their input since their wants and needs differ from those of adults. Differences in preferences or sensory acuity between children and adults, or both, are well established (De Graaf & Zandstra, 1999; Drewnowski, 1997; Liem, Mars, & de Graaf, 2004; Zandstra & De Graaf, 1998). Literature data have reported marked age-related differences in sweet taste discrimination and preference (Liem, Mars, et al., 2004) as well as in sour taste preference (Liem & Mennella, 2003). Likewise, texture preference has been found to vary from childhood to adulthood (Lukasewycz & Mennella, 2012; Zeinstra, Koelen, Kok, & de Graaf, 2010). Therefore, it is impossible to predict the nature of these differences without actual information from the intended target group. Furthermore, a better understanding of children's food preferences could also help design strategies to reduce obesity and malnutrition. Recently, international guidelines have been established on prevention and control of the so-called non-communicable diseases, with specific emphasis on childhood obesity (WHO, 2012). Several actions are proposed, one of which is shaping taste preferences from an early age through information and awareness campaigns addressed towards schools, families, and childhood aggregation centers. Food preferences, particularly in children (Birch, 1999; Laureati, Bertoli, et al., 2015), are indeed believed to play a central role in the prediction of human food choices (Drewnowski, 1997; Köster, 2009). In this context, sensory preferences and thus the methods used to explore them, play a key role for understanding children's the food behavior and directing them towards healthier choices.

The sensory methods used with children have been reviewed by Guinard (2001) and Popper and Kroll (2005). In these two review articles, the authors stressed the importance of using procedures that are appropriate for different age groups, considering the sensory, cognitive and social factors that may impact testing with children. These issues are also included in the recently revised international standard guideline on sensory evaluation by children and minors (ASTM, 2013).

Starting from these two articles, the present review reconstructs the framework regarding the study of children's preferences from 1980 to 2000. The progress made from 2000 to 2015 in the field of consumer testing (i.e. study of liking and preference) with children is examined to identify the main research domains and to show trends in application of consumer research with children in terms of new methods used, either together or in addition to existing ones. Specific attention is also devoted to the appropriateness of methods according to children's age.

2. Research domains for conducting sensory testing with children

A search for relevant papers and categorization of the research challenges of food sensory studies on children is not an easy task since it is a highly multidisciplinary and heterogeneous area. Some considerations may come from the number of cited papers in two relevant databases: Scopus (science, technology, health, medicine, social sciences, arts and humanities) and Pubmed (more related with health and medicine).

Considering the keywords "children food preferences" or "children food sensory" from 2000 to 2014, without applying any filter, Scopus (http://www.scopus.com/) returned 3172 documents and Pubmed (http://www.ncbi.nlm.nih.gov/pubmed) 1812; the increase over time is almost linear for both databases with similar peaks in 2008 and 2012. The number of published papers increased approximately 4.1-fold (Scopus) and 4.6-fold (Pubmed) from 2000 to 2014 (Fig. 1). In 2013, there was a decrease in the number of publications (ratio of publication 2013/2012 = 0.8), confirmed by the same trend in 2014.

Looking at the subject areas present in databases, around one-third or one-fourth of the cited papers concern "Health and Medicine", and it would appear that the sensory research on children has "Medicine" and "Nursing" as main subject areas (Scopus), followed by "Agricultural and Biological Sciences" even if many other areas have contributed to the increase in the number of publications during the period analyzed.

Articles were further categorized to identify specific research topics. To do so, after the initial search with the main keywords

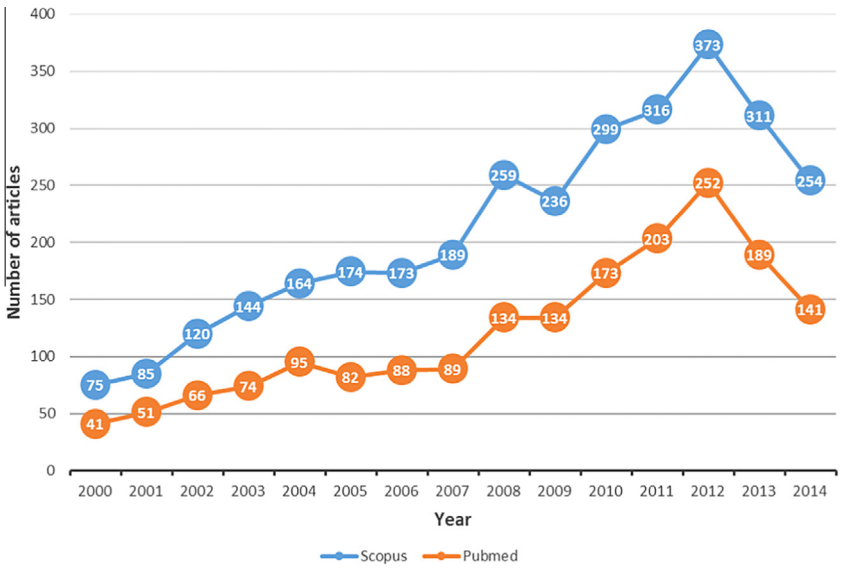

Fig. 1. Number of papers cited by Scopus and PubMed in 2000–2014, sorted by the keywords "children food preferences" or "children food sensory".