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Factors influencing changes in sustainability perception of various food behaviors: Results of a longitudinal study

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ABSTRACT

It is important to understand better how people evaluate the environmental impacts of different food aspects. A longitudinal panel study design ($N = 2600$) was used to examine whether the perceptions of various environment-related, food consumption patterns changed between 2010 and 2014 and what factors influenced such changes. The results indicated that participants evaluated the eating less meat (maximum of once or twice per week) behavior as substantially more beneficial for the environment in 2014 compared with 2010. The study design allowed us to examine which factors influenced the changes in the perception of the environmental benefits of eating less meat. Participants who perceived the arguments that reducing meat consumption is better for the environment, better for the health, and prevents animal suffering as more convincing in 2014 compared with 2010 also perceived eating less meat as more beneficial for the environment in the 2014 survey compared with the 2010 survey. An increase in participants' health consciousness and the change scores in their convictions that seasonal fruits and vegetables taste better and are cheaper strengthened their belief that such behaviors would be beneficial for the environment. Therefore, the results suggest that the halo effect may have influenced participants' evaluations. Consumers lack general factual knowledge about product-specific environmental footprints. Highlighting the direct benefits for consumers will likely increase their willingness to reduce environment-unfriendly consumption patterns.

1. Introduction

Food consumption strongly contributes to the environmental impacts of households in European countries (Tukker & Jansen, 2006). However, a huge variation has been shown in greenhouse gas emissions from different meals containing the same amounts of calories or protein (Carlsson-Kanyama, 1998). It is possible to reduce the environmental impacts related to food production and consumption and at the same time, adopt a healthier diet (Westhoek et al., 2014). With their daily food choices, consumers more or less consciously make important environmental decisions that have huge impacts. Therefore, it is essential to gain a better understanding of people's decision-making processes in terms of ecological food consumption and how they evaluate the environmental impacts of different food aspects.

Previous research already examined factors that influenced consumers' willingness to buy and to consume organic food products (Lockie, Lyons, Lawrence, & Grice, 2004; Magnusson, Arvola, Hursti, Aberg, & Sjoden, 2003), as well as factors influencing ecological consumption (Feldmann & Hamm, 2015; Lee & Yun, 2015; Schösler, de Boer, & Boersema, 2014; Tobler, Visschers, & Siegrist, 2011a; Wandel & Bugge, 1997; Yazdanpanah, Forouzani, & Hojjati, 2015; Zhu, Li, Geng, & Qi, 2013). A different but related research question focused on what product attributes people based their evaluation of the environmental friendliness of food products (Lea & Worsley, 2008; Tobler et al., 2011a; Tobler, Visschers, & Siegrist, 2011b). It is vital to address both these questions because consumers need the proper motivation to buy green products as well as the ability to correctly distinguish more environment-friendly options from less environment-friendly ones. Our study focused on the latter question.

Life cycle analyses show that reducing the consumption of meat and dairy products considerably decreases both the environmental impacts (Jungbluth, Tietje, & Scholz, 2000) and greenhouse gas emissions (Popp, Lotze-Campen, & Bodirsky, 2010) associated with food production and consumption in developed nations. Avoiding the use of products transported by air is another important way to reduce the overall environmental impact of foods (Jungbluth et al., 2000). Furthermore, heated greenhouse production should

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be avoided if the environmental impacts of food production are to be reduced. It seems difficult for many consumers to correctly evaluate the environmental friendliness or impacts of food products (Lea & Worsley, 2008; Tobler et al., 2011a,b). Past research results suggest that consumers inaccurately estimate the environmental impacts of various product attributes. The environmental impact of food packaging tends to be overrated, for example (Lea & Worsley, 2008; Tobler et al., 2011a,b). Consumers are confronted with the packaging because they unpack the food and dispose of the package. However, they underestimate the environmental impacts of food production, specifically of meat and dairy products. Many people do not perceive meat production as related to climate change (de Boer, Schösler, & Aiking, 2014). Similar results were found in a study that asked participants to evaluate the environmental benefits of various food consumption patterns. Reducing meat consumption was perceived as the least environmentally beneficial behavior (Tobler et al., 2011a).

To be properly motivated, consumers need to be convinced that behavioral changes can have positive environmental effects. A study examining perceived barriers to climate-friendly food choices among Finnish university students found that besides habits, disbeliefs in the effects of food consumption on climate change were important reasons for not adopting more climate-friendly, food consumption patterns (Mäkiniemi & Vainio, 2014). Additionally, significant gender effects suggest that females are generally more convinced that changes in food consumptions have beneficial effects on the environment (Tobler et al., 2011a).

Food choices are influenced by several factors (Renner, Sproesser, Strohbach, & Schupp, 2012; Steptoe, Pollard, & Wardle, 1995). Various eating motives can create goal conflicts, and consumers have to make trade-offs (e.g., taste versus healthiness). People's eating motives (e.g., concern about health and reducing meat consumption) can facilitate environment-related food choices, but other eating motives (e.g., hedonic pleasure and meat consumption) can impede more environment-friendly food choices. Some food patterns have both non-environmental and environmental benefits. For example, seasonal and regional fruits and vegetables may also be perceived as better tasting and fresher (Chambers, Lobb, Butler, Harvey, & Traill, 2007), in addition to their environmental friendliness due to shorter transportation and the use of unheated greenhouses. Reducing meat consumption can also be influenced by different motives. Next to health concerns (Beardsworth & Keil, 1991) and issues related to animal welfare (Ruby, Heine, Kamble, Cheng, & Waddar, 2013), environmental concerns may be additional reasons for reducing meat consumption.

Besides the motivation to show green behavior, it is important that consumers believe that certain changes in food consumption are beneficial for the environment (Mäkiniemi & Vainio, 2014). Therefore, our study aimed to examine how the acceptance of various arguments for changing food consumption patterns would influence the perceived environmental benefits of these patterns. A longitudinal study design allowed us to examine whether perceptions of various environment-related, food consumption patterns changed between 2010 and 2014. Additionally, we examined how convincing the consumers found various arguments for reducing consumption of meat and increasing that of seasonal fruits and vegetables. Finally, the longitudinal panel design enabled us to investigate whether changes in how convincing these arguments were perceived had impacts on how environmentally beneficial these two food consumption patterns were perceived. A health halo effect had previously been found regarding consumers' food perceptions (Schuldt, Muller, & Schwarz, 2012). Therefore, we expected that an increase in health consciousness would cause a positive evaluation of environmental impacts. Our research results provide some insights into which aspects of communication should be the focus to convince consumers that reducing meat consumption and eating seasonal fruits and vegetables are beneficial for the environment.

2. Methods

2.1. Participants

This study analyzed data from the Swiss Food Panel, a population-based longitudinal study of the Swiss people's eating behaviors. In 2010, a mail survey was sent out to 20,912 household addresses randomly selected from the telephone book in the German- and French-speaking regions of Switzerland. In the first wave (2010), 6290 of the invited participants completed the food panel questionnaire (30% response rate). Each participant received another questionnaire in February of each consecutive year (2010–2014). The respondents with missing gender, age, or address details; those who had died; those unwilling to participate in the next survey; and those who completed less than 50% of the questionnaire were excluded from the study (Fig. 1). Additionally, data from all waves were matched, and persons with different birthdates or genders, as well as inconsistent body heights at the baseline and follow-up (>5-cm difference), were excluded ($n = 181$) because we assumed that other persons had completed the questionnaires on behalf of these respondents. The final sample consisted of 2600 persons (46% male) with a mean age of 58 years (SD = 14) in 2014. For descriptive purposes, the self-reported educational level (in 2014) was categorized as follows: 6% low (no education or primary and lower secondary school), 39% middle

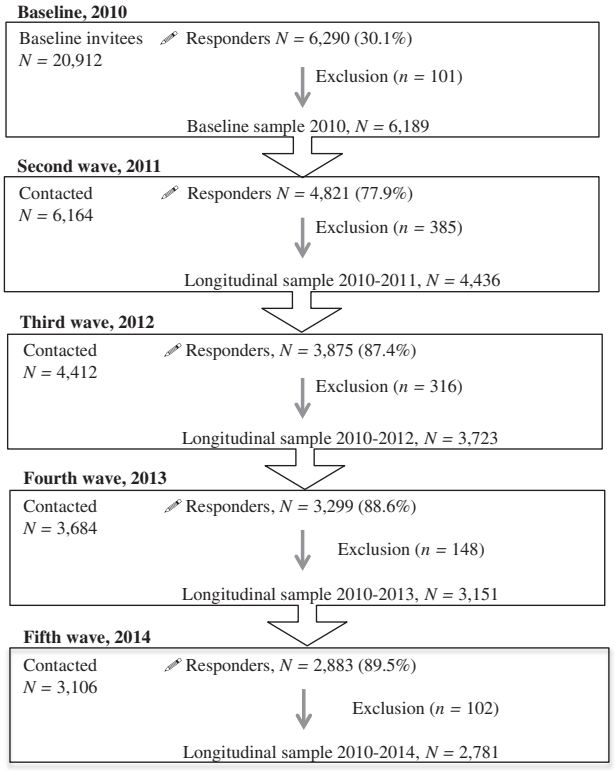

Fig. 1. Flow chart of the study sample development. The flow chart depicts the study sample from the Swiss Food Panel. Excluded were those participants with missing gender, age, or address details; those who died; those unwilling to participate in the next wave; and those who filled in less than 50% of the questionnaire. Participants with inconsistent indicator variables (gender and birthdate) between waves were also excluded.