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Lost in processing? Perceived healthfulness, taste and caloric content of whole and processed organic food

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ABSTRACT

The "organic" claim explicitly informs consumers about the food production method. Yet, based on this claim, people often infer unrelated food attributes. The current research examined whether the perceived advantage of organic over conventional food generalizes across different organic food types. Compared to whole organic foods, processed organic foods are less available, familiar and prototypical of the organic food category. In two studies (combined $N = 258$) we investigated how both organic foods types were perceived in healthfulness, taste and caloric content when compared to their conventional alternatives. Participants evaluated images of both whole (e.g., lettuce) and processed organic food exemplars (e.g., pizza), and reported general evaluations of these food types. The association of these evaluations with individual difference variables – self-reported knowledge and consumption of organic food, and environmental concerns – was also examined.

Results showed that organically produced whole foods were perceived as more healthful, tastier and less caloric than those produced conventionally, thus replicating the well-established halo effect of the organic claim in food evaluation. The organic advantage was more pronounced among individuals who reported being more knowledgeable about organic food, consumed it more frequently, and were more environmentally concerned. The advantage of the organic claim for processed foods was less clear. Overall, processed organic (vs. conventional) foods were perceived as tastier, more healthful (Study 1) or equally healthful (Study 2), but also as more caloric. We argue that the features of processed food may modulate the impact of the organic claim, and outline possible research directions to test this assumption. Uncovering the specific conditions in which food claims bias consumer's perceptions and behavior may have important implications for marketing, health and public-policy related fields.

Food labeling constitutes an important strategy to help consumers make food choices. These labels include claims that create expectations, which in turn influence consumer's perception, hedonic appraisal, and consumption of products (for a review, see Piqueras-Fiszman & Spence, 2015). Examples of such claims include "low fat" (Ebneter, Latner, & Nigg, 2013; Wansink & Chandon, 2006), or "low carbs" (Labiner-Wolfe, Jordan Lin, & Verrill, 2010). Research has shown that this information is often misunderstood or misinterpreted (for a review, see Provencher & Jacob, 2016). Indeed, even claims unrelated to product composition, such as "fair trade" (e.g., Schuldt, Muller, & Schwarz, 2012) or "organic" (e.g., Schuldt & Schwarz, 2010), have been shown to influence consumer perception and behavior.

The organic claim explicitly informs consumers about the food production method. However, this claim seems to represent a cluster of attributes that goes beyond production-specific characteristics (e.g., pest management, fertilizer usage and soil treatment). Specifically, organic products seem to be associated with ethical, health and environmental concerns, as well as nutrition and food safety aspects (for a review, see Fernqvist & Ekelund, 2014). The literature focusing on the comparison between organic and conventional food production methods is not consensual regarding the nutritional superiority and health benefits of organic food (Barański et al., 2014; Dangour et al., 2010; Smith-Spangler et al., 2012; Williams, 2002). Nonetheless, individuals often infer proprieties that are unrelated to the production method, perceiving organic food more positively than conventional food. This belief

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seems to hold even when consumers are exposed to scientific evidence that refutes it (Olson, 2017). Besides influencing product evaluation, the organic claim seems to impact judgments about the consumer of such products. For example, foregoing exercise is deemed more acceptable when a target person ate organic (vs. conventional) food (Prada, Rodrigues, & Garrido, 2016a; Schuldt & Schwarz, 2010).

The impact of the organic claim on product evaluation has been assessed across different evaluative dimensions, including sensory proprieties, nutritional judgments and value-related judgments. For example, when compared to conventional food, organic food is perceived as having better nutritional qualities (Lee, Shimizu, Kniffin, & Wansink, 2013; Sörqvist et al., 2015b), as safer to consume (Ellison, Duff, Wang, & White, 2016; Hoefkens, Verbeke, Aertsens, Mondelaers, & Van Camp, 2009), as environmentally friendly (Lazzarini, Zimmermann, Visschers, & Siegrist, 2016), and even as having more benefits for mental performance (Sörqvist et al., 2015b). Not surprisingly, consumers are willing to pay more for organic products (Lee et al., 2013; Sörqvist et al., 2015b; van Doorn & Verhoef, 2011; Wiedmann, Hennigs, Behrens, & Klarmann, 2014), and are more likely to recommend such products to others (e.g., Wiedmann et al., 2014). Research also shows that when an unfamiliar brand retails an organic (vs. conventional) product, both the attitude towards that brand and brand trust are enhanced (Ellison et al., 2016). This bias has been interpreted as reflecting a halo effect (i.e., the positive influence of a given positive attribute on other unrelated attributes; Thorndike, 1920; see also Schuldt & Schwarz, 2010).

The magnitude of the impact of the organic label on food perception depends on how such attribute is itself perceived. This implies that the halo effect is only likely to be observed in participants that believe in the advantage of organic food over conventional one (e.g., Sörqvist, Marsh, et al., 2016). This idea is supported by previous research suggesting that individuals with pro-environmental attitudes or behaviors are more prone to such halo effect (e.g., Schuldt & Schwarz, 2010; Sörqvist, Langeborg, & Marsh, 2016; see also; Holmgren, Kabanshi, & Sörqvist, 2017; Sörqvist, Haga, Holmgren, & Hansla, 2015a), at least when certain evaluative dimensions are assessed. For example, participants who report more positive attitudes towards sustainable consumer behavior (e.g., those who buy eco-friendly products, or pre-separate waste at source) show a greater taste preference and willingness-to-pay for an "eco-friendly" (vs. conventional) product (Sörqvist et al., 2013), and judge the eco-friendly alternative more favorability across evaluative dimensions (e.g., health benefits; vitamin content; Sörqvist et al., 2015b). Schuldt and Hannahan (2013) have also shown that individuals with low environmental concerns expected organic food to taste worse than conventional food. However, they also found that ratings of perceived healthfulness were independent of environmental concerns. On the other hand, Lee et al. (2013) showed that the effect of an organic claim on perceived calories is weaker for individuals who often engage in pro-environmental activities, or buy this type of food more often.

The main goal of the current paper was to examine whether the impact of organic claims generalizes to different food types. Specifically, we examined the perception of whole and processed organic food products, by considering evaluations of food exemplars and general evaluations of both food types. The evaluations of organic food types were made by comparing them to their conventional counterparts in three dimensions – healthfulness, taste and caloric content. In addition to our primary goal, we also examined the role of individual difference variables – self-reported knowledge about organic food, frequency of consumption of organic food, and environmental concerns – that might be associated with these evaluations (e.g., Schuldt & Hannahan, 2013). Finally, we present normative ratings of food exemplars, as they are likely to be useful to researchers investigating the impact of organic claims on product evaluation.

1. Organic claims bias on healthfulness, taste and caloric content perception

The evaluative dimensions of healthfulness, taste, and caloric content have been used in the context of organic food (Schleenbecker & Hamm, 2013), as well as in other food judgment research, including normative ratings of food images (Blechert, Meule, Busch, & Ohla, 2014; Charbonnier, van Meer, van der Laan, Viergever, & Smeets, 2016; Foroni, Pergola, Argiris, & Rumiati, 2013). Health and taste quality often emerge as the primary reasons for purchasing organic food (Hughner, McDonagh, Prothero, Shultz, & Stanton, 2007; Pearson, Henryks, & Jones, 2011; Schifferstein & Oude Ophuis, 1998).

Research has consistently shown that organic food is perceived as more *healthful* than conventional food. This effect is found both when individuals are judging the general organic food category (e.g., Schuldt & Hannahan, 2013), and when they are judging specific food exemplars (e.g., Lazzarini et al., 2016; Prada et al., 2016a; Sörqvist et al., 2015b). Perceived healthfulness of a food product, in turn, influences food intake (e.g., Provencher, Polivy, & Herman, 2009).

Taste seems to override other organic food sensory proprieties such as appearance (for a review, see Hemmerling, Asioli, & Spiller, 2016). This dimension has often been assessed by having participants sampling a product (taste perception). Several studies comparing taste perception between organic and conventional foods (e.g., Annett, Muralidharan, Boxall, Cash, & Wismer, 2008; Ekelund, Fernqvist, & Tjärnemo, 2007; Kihlberg, Johansson, Langsrud, & Risvik, 2005; Poelman, Mojet, Lyon, & Sefa-Dedeh, 2008; Rousseau, 2015; Sörqvist et al., 2015b; Tobin, Moane, & Larkin, 2013) report inconsistent findings that do not seem to support a general taste advantage for organic food (see also Bourn & Prescott, 2002). In fact, results seem to depend on sampling conditions (Pagliarini, Laureati, & Gaeta, 2013), and on the type of product. For example, yogurt labeled as organic was considered more flavorful than the conventional one, whereas the opposite effect emerged for cookies (Lee et al., 2013); and organic orange juice was preferred over conventional one, but no differences emerged for milk (Fillion & Arazi, 2002).

In line with previous research, in the current studies the taste dimension was assessed without an actual sampling of the product, namely by asking participants to anticipate its taste (i.e., expected taste, see Fernqvist & Ekelund, 2014; Piqueras-Fiszman & Spence, 2015). For example, Schuldt and Hannahan (2013) included a general taste judgment about organic food (i.e., "compared to other foods, please rate how tasty organic foods tend to be") and found that organic food is perceived as less tasty than conventional food. Other authors, in contrast, did not find differences between organic and conventional food regarding it's expected taste (e.g., Ellison et al., 2016; Loebnitz & Aschemann-Witzel, 2016).

Perceived caloric content constitutes a relevant food evaluative dimension that is strongly correlated with actual caloric content (Charbonnier et al., 2016; Foroni et al., 2013). Research comparing organic and conventional food have shown that individuals perceive organic food as having fewer calories than conventional food (e.g., Lee et al., 2013; Prada et al., 2016a; Sörqvist et al., 2015b). For example, Schuldt and Schwarz (2010, Study 1) tested if an organic claim biased judgments of a real food product – Oreo cookies – by examining both conventional and organic versions ("Oreo cookies made with organic flour and sugar"). The organic (vs. conventional) version was perceived as less caloric and as more