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Evaluative conditioning of food technologies in China: Moderating effect of social trust

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ABSTRACT

This study provides an initial examination of the evaluative conditioning (EC) of consumers' attitudes toward food technologies in China, including how EC can affect consumer acceptance of new technology when participants possess different levels of social trust. In a study using the EC paradigm and a combination of between-subjects control groups and within-subjects control conditions, participants considered three food technologies (conventional, enzyme, and genetic), paired with affectively positive, neutral, and negative images. Subsequent evaluative measurements revealed that EC can explain attitude formation toward food technologies in China when consumers see affective images, but the strength of the effects varies at different levels of social trust. Participants with a high level of trust in the institutions that promote and regulate the technologies can be conditioned both positively and negatively, independent of food technology. Participants with a low level of trust can be conditioned too, but only when the technology is paired with negative unconditioned stimuli. If social trust is low, positive conditioning of food technologies is not demonstrated in this study.

Introduction

Consumer attitudes toward new food technologies vary across countries: Public opinions in Europe are generally ambivalent or critical towards high-tech foods, whereas in China, consumers seem more positive toward them (Zhang, Huang, Qiu, & Huang, 2010). These attitudes in turn influence purchasing decisions, leading managers and food researchers to seek out explanations of how consumers' attitudes toward different food technologies form. Although researchers have documented widely divergent attitudes to different food technologies (e.g., organic production versus genetic modification), our knowledge about how consumers develop these attitudes remains limited.

In this context, we turn to the concept of evaluative conditioning (EC), which refers to a change in the valence of a conditioned stimulus (CS) due to its pairing with another, unconditioned stimulus (US) (De Houwer, 2007). Many studies demonstrate EC effects in a food context and show that EC can explain the acquisition of food preferences (Kerkhof, Vansteenwegen, Baeyens, & Hermans, 2009; Verhulst, Hermans, Baeyens, Spruyt, & Eelen, 2006). Although some scholars allude to EC as a post hoc explanation of consumer acceptance of food technologies (Olsen, Grunert, & Sonne, 2010; Olsen et al., 2011), only one study adopts an EC framework to investigate attitude formation (Loebnitz & Grunert, 2013). At least two issues demand further exploration. First, previous studies primarily consider the EC paradigm in relation to developed, mostly Western nations (i.e., United States, European countries). Yet China is one of the largest producers of genetically modified crops in the world (Curtis, McCluskey, & Wahl, 2004), and Chinese attitudes toward new food technologies appear to diverge from those of European consumers, so it is imperative to understand how Chinese consumers form attitudes toward new food technologies. In an extension of recent findings that indicate EC can explain attitudes toward food technologies (Loebnitz & Grunert, 2013), we ask, Does evaluative conditioning apply in the context of attitudes to food technologies in China? Second, past research indicates that Chinese consumers have more positive attitudes regarding food technologies (i.e., genetic modification; Zhang et al., 2010) and higher trust in institutions promoting and regulating these technologies than consumers in other countries (Curtis et al., 2004). Social trust is an important determinant of technology's acceptance (Siegrist, 2000), so is social trust perhaps driving Chinese attitudes toward food technologies? In answering these questions, we seek to accomplish two objectives: (1) investigate if attitude formation toward food technologies in China can be explained by EC and (2) discover if social trust moderates the evaluative conditioning effect on consumers' attitude toward food technologies. Accordingly, we collected data from consumers in China.

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Literature review

Consumer acceptance of food technology

Two main lines of thought attempt to explain how attitudes to technologies form and become integrated into overall product judgments. First, in a top-down approach, socio-political attitudes predict consumers' attitudes toward different food technologies. Thus for example, views on nature and the environment (Frewer, Howard, Hedderley, & Shepherd, 1997), science and technology (Hamstra & Smink, 1996), social trust (Siegrist, 2000), and industrial food production (Beckmann, Brokmose, & Lind, 2001) guide overall attitude formation and serve as a higher-order anchor for evaluations of a food technology (Grunert, Bredahl, & Scholderer, 2003). Consumers who have highly positive attitudes toward nature and the environment then should have less favorable attitudes toward high-tech food technology, especially if they seem to interfere with nature, such as genetic modification. Social trust is one of the strongest predictive factors for the formation of attitudes toward food technologies (Qiu, Huang, Pray, & Rozelle, 2012), though Søndergaard, Grunert, and Scholderer (2005) find considerable differences in the influence of social trust on attitude formation across European countries, so it may be culturally specific (Poppe & Kjærnes, 2003). In China, consumers appear more trusting of institutions that promote and regulate food technologies (Curtis et al., 2004); in Europe, social trust is heterogeneous, with Scandinavian consumers conveying more trust than British consumers (Frewer, 1999). Generalizing from these international differences in social trust, we anticipate that consumers' attitude formation is culturally dependent (Gaskell, Allum, & Stares, 2003; Poppe & Kjærnes, 2003). Independent of the country of investigation though, prior results suggest a positive relationship between social trust and consumers' acceptance of food technology (Lin, Somwaru, Tuan, Huang, & Bai, 2006).

Second, the bottom-up approach emphasizes how information about the potential risks and benefits of a food technology can influence consumer acceptance (Grunert et al., 2003; Scholderer & Frewer, 2003). Various studies investigate the effects of giving consumers information (e.g., benefits, risks, consequences; Olsen et al., 2010) by measuring consumer acceptance in terms of preferences (Lähteenmäki et al., 2002), intentions to buy (Grunert, Bech-Larsen, Lähteenmäki, Ueland, & Aström, 2004), attitude toward the technology (Eiser, Miles, & Frewer, 2002), and perceptions (Siegrist, 2000) as dependent variables. Thus, food researchers seeking to modify attitudes toward new technologies using the bottom-up approach focus on providing educational information (Teisl, Fein, & Levy, 2009), which emphasizes the benefits and deemphasizes their risks.

Both approaches have merits, yet they may fail to account for the emotional aspects of the process. Existing studies only deal with cognitive processes that lead to acceptance or rejection of a technology but ignore any corresponding affective processes that are not grounded in cognitive processing of information. This gap may explain two conundrums in prior research: (1) Although the provision of information is generally effective in increasing knowledge, it cannot change existing attitudes and only reinforces negative attitudes (Frewer, Scholderer, & Bredahl, 2003) and (2) attitude formation still occurs, even in cases with limited information (Olsen et al., 2010).

Evaluative conditioning

Evaluative conditioning refers to the extent to which pairing an affectively meaningful with a neutral stimulus changes the valence of the neutral stimulus (Walther, Weil, & Langer, 2011). The cooccurrence of positive/negative images (US) with a neutral stimulus (CS) may result in a spillover of the positivity/negativity from the unconditioned to the conditioned stimulus (for a review, see Hermans, Baeyens, & Eelen, 2003). Hofmann, De Houwer, Perugini, Baeyens, and Crombez (2010) also describe two characteristics of EC that distinguish it from classical conditioning: (1) EC takes place without contingency awareness (Olson & Fazio, 2001), though EC effects are stronger for participants with higher compares with lower contingency awareness, and (2) EC effects appear resistant to extinction, such that CS-alone presentations will not interfere with them (Baeyens, Diaz, & Ruiz, 2005), though they eventually may decrease in extinction studies (Hofmann et al., 2010).

Some studies fail to confirm EC effects (e.g., Field & Davey, 1999), but researchers across different disciplines have demonstrated that preferences can form and attitudes change through this conditioning (De Houwer, Thomas, & Baeyens, 2001). Furthermore, it is reasonable to assume that real-world factors such as advertising (Gibson, 2008; Stuart, Shimp, & Engle, 1987) and brand placement (Schemer, Matthes, Wirth, & Textor, 2008) result in EC effects when a previously neutral/novel stimulus is contingently paired with another (positive or negative) stimulus, resulting in consumer liking or disliking. Empirical research also indicates that particular technologies (e.g., genetic modification of food) often appear in negative contexts, while others appear in positive contexts. As a result of negative media coverage in Europe for example (Gaskell, Bauer, Durant, & Allum, 1999), genetic technology is often associated with high risk and uncertainty (Bredahl, 2001), whereas conventional technology appears congruent with high consumer benefits (e.g., health, safety; Grunert et al., 2001).

Significant research has applied EC to the acquisition of food preferences, suggesting that food likes/dislikes can be explained according to an EC paradigm (Kerkhof et al., 2009; Verhulst et al., 2006). Beyond studies that use a standard picture–picture paradigm (visual stimuli) to examine food preference formation, researchers confirm EC effects using sensory liking (flavor; Verhulst et al., 2006), expected consequences (Verhulst et al., 2006), odors (Hermans, Baeyens, Lamote, Spruyt, & Eelen, 2005), and gustatory stimuli (Zellner, Rozin, Aron, & Kulish, 1983). A few researchers even have shown that it is possible to change consumer attitudes toward new food technologies by exposing them to a superior sensory product experience, which induces positive sensory-based affect (Grunert et al., 2004; Scholderer, Grunert, & Søndergaard, 2006). For example, Grunert et al. (2004) demonstrate that attitudes to new food technologies grow more positive after trial of products that contain the technology, though only if those products produce a positive sensory experience. Similarly, Scholderer et al. (2006) find that participants evaluate a technology more positively after even a single trial with a superior sensory product experience. Olsen et al. (2011) confirm the effect of a sensory product experience on consumer attitudes to food technologies and further note that the weight consumers grant to different production methods in their product evaluations depend on their product experience. Participants who taste the product prior to their choice place less emphasis on the production method than participants with no sensory product experience. In summary, the cooccurrence of a positive (superior) sensory experience with a novel stimulus (technology) can result in a spillover of the positivity of taste to the stimulus. These findings allude to EC, but most studies use it solely as a post hoc explanation of unpredicted results, making it impossible to conclude that EC is responsible for the attitude change. Olsen et al. (2011) suggest the need to understand EC as an explanatory mechanism of consumer preference formation for food technologies.