

The cognitive processes at play in Food Consumer Confusion

Consumers often encounter overwhelming, conflicting information about food, potentially leading to confusion. However, the mechanisms at play in consumer confusion remain unclear. Using a quantitative study, we therefore investigate how conflicting environmental food labels impact consumer confusion, and any spillover effect (i.e., when confusion related to a product engenders confusion related to other products). We show how cognitive load and skepticism drive consumer confusion, while cognitive dissonance does not, and the existence of a potential spillover effect. As such, we offer insights for consumers, managers, and policymakers and contribute to consumer confusion research.

Key words: consumer confusion; information proliferation; cognitive processes

Track: consumer behaviour

1. Introduction

Consumers are frequently exposed to extensive and sometimes conflicting information about food attributes through sources such as government campaigns, advertisements, and Front-of-Pack (FOP) labels. This information overload can lead to confusion and counterproductive choices. However, the psychological mechanisms driving confusion in food purchasing are not well understood. Our exploratory study identified three core psychological mechanisms underlying consumer confusion: 1/ Cognitive Load – the strain on working memory caused by excessive information demands (Schnitz & Kürschner, 2007); 2/ Cognitive Dissonance – the discomfort arising from holding inconsistent beliefs or engaging in conflicting behaviors (Cooper & Carlsmith, 2015) and 3/ Situational Skepticism – a momentary state of distrust and suspicion regarding corporate motives (Forehand & Grier, 2003). Previous research has associated cognitive load, cognitive dissonance, and skepticism with consumer confusion as antecedents, outcomes, or moderators (Chauhan & Sagar, 2021; Fitzgerald, Donovan, Kees and Kozup, 2019). Moreover, these factors have been identified as consequences of increasing sustainability labels (Bratt, Hallstedt, Robèrt, Broman and Oldmark, 2011). However, they have not yet been fully conceptualized as the core cognitive processes that compose consumer confusion.

We conducted an exploratory qualitative study that suggests these three concepts as cognitive processes of Food Consumer Confusion. Thus, this present research aims to confirm that cognitive load, cognitive dissonance, and skepticism are at play in FCC-and to examine relationships between these three cognitive processes. The second objective is to examine whether consumer confusion about one food product can transfer to confusion about unrelated products, a possibility suggested by the spillover effect—where one behavior influences engagement in another (Nilsson, Bergquist and Schultz, 2017). To our knowledge, spillover effects have not been studied in consumer confusion, though their existence could have significant implications for both managers and policymakers.

2. Theoretical Background

Information proliferation results from various sources, including social media, governmental health recommendations, scientific reports, and front-of-pack labels (Mazzù, Pozharliev, Andria and Baccelloni, 2024). In this research, we focus on food labels as a source

of information. In the literature, they are usually considered as signals (Brach, Walsh and Shaw, 2018), aiding consumer decision-making by revealing hidden product qualities (Bauer, Heinrich and Schäfer, 2013) and providing simple heuristics to reduce complexity and choice overload (Thøgersen & Nielsen, 2016). However, like any other information formats, food labels can also lead to confusion through overwhelming, ambiguous, or similar labels (Torma & Thøgersen, 2024).

Consumer confusion (CC) is defined as “a negatively valenced state of mind with emotional and cognitive components in which consumers lack comprehension or understanding of marketplace stimuli” (Fitzgerald et al., 2019, p. 308). This confusion can disrupt information processing (Mitchell & Papavassiliou, 1999), decrease label informativeness (Harbaugh, Maxwell and Roussillon, 2011) and even lead to purchase abandonment (Wobker et al., 2015).

Overloading information (i.e., too numerous pieces of information that appear simultaneously or at different moments) has been identified as a cause of consumer confusion (Torma & Thøgersen, 2024). This phenomenon can be explained by cognitive load theory, which posits that when the amount of information presented exceeds the capacity of working memory, it leads to information overload (Graf & Antoni, 2020). Therefore, we hypothesize:

H1. The combination of two opposite-valence labels in comparison with one positive label increases cognitive load, which increases general confusion.

Congruity theory posits that conflicting information arises when two pieces of information represent opposite arguments (Osgood & Tannenbaum, 1955). This is evident with opposite-valence labels, which can lead to consumer confusion (Sirieix, Delanchy, Remaud, Zepeda and Gurviez, 2013). Cognitive dissonance – the discomfort arising from holding inconsistent beliefs or engaging in conflicting behaviors (Cooper & Carlsmith, 2015), may explain this, as internal conflicts can trigger confusion. Therefore, we hypothesize:

H2. The combination of two opposite-valence labels in comparison with one positive label increases cognitive dissonance, which increases general confusion.

Third, consumers may distrust scientific information about food due to perceived contradictions between labels. This uncertainty can lead to negative attitudes (Chang, 2015), reduced trust in science-based health information (Lyons, Merola and Reifler, 2020), and poorer health behaviors, such as increased consumption of unhealthy foods (Vijaykumar,

McNeill and Simpson, 2021). Instead of using the concept of trust, we rather refer to situational skepticism – a momentary state of distrust and suspicion regarding corporate motives (Forehand & Grier, 2003), as confused consumers are not necessarily completely distrusting information, but rather doubting the information. The consequences of distrust may be the same than that of skepticism due to the closeness of the two concepts. Therefore, we hypothesize:

H3. *The combination of two opposite-valence labels in comparison with one positive label increases skepticism, which increases general confusion.*

Confusion triggered by a specific stimulus may lead to a general sense of confusion about food consumption, potentially extending to unrelated products. We propose that repeated exposure to confusing situations (e.g., perceived contradictory packaging claims or diet-related health advice conflicting with prior beliefs) could foster a broader feeling of confusion. This, in turn, might heighten consumers' sensitivity to other potentially conflicting situations, even when the initial confusion-triggering stimuli are not salient or even entirely absent (e.g., if conflicting Nutri-Score and Eco-Score labels raised doubts about their credibility, consumers might feel confused when encountering the Nutri-Score alone). Thus:

H4. *The combination of two-opposite valence labels in comparison with one positive label increases general confusion, which increases specific confusion regarding unrelated products.*

Figure 1 displays our conceptual model.

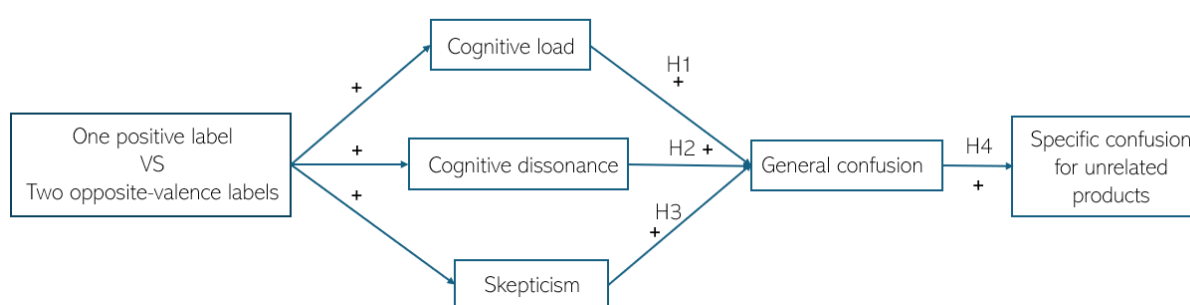


Fig. 1. Conceptual model

3. Experiment

To test our conceptual framework, we explore the effect of the addition of a bad Eco-Score to a MSC label. Both Eco-Score and MSC labels address sustainability: the Eco-Score evaluates the entire environmental footprint of a product (French Ministry of Ecological Transition and Territorial Cohesion, 2023), while the MSC label specifically focuses on sustainable fishing practices (MSC official website, 2024). Participants were asked to imagine themselves in a shopping context by asking them to consider the purchase of a piece of fish, and were randomly assigned to the experimental conditions. Our stimuli are inspired by retailer websites. They include a picture and the price of the fish, the name of the fish, the weight, the label(s), and a fictitious brand, designed to closely resemble real-world scenarios, as can be seen on Figure 3.

One positive label	 Smoked salmon "The old fisherman" 140 grams € 7,99 
Two opposite-valence labels	 Smoked salmon "The old fisherman" 140 grams € 7,99  

Fig. 3. Experimental conditions

Consent was obtained, and anonymity was assured at the start of the questionnaire. Data was collected from an online panel provided by a marketing research institute. To ensure data reliability, respondents who reported not consuming fish, who failed the attention checks or the label understanding questions, and who answered too quickly or too slowly (i.e., completing the survey in less than 160 seconds or more than 1500 seconds) were excluded. The final sample consisted of 202 participants, 60% women ($M_{age} = 44$ years, $SD = 13.77$).

We assessed general confusion, reflecting participants' overall difficulty with food choices, using three items adapted from Walsh, Hennig-Thurau and Mitchell (2007): *"It is more and more complicated to identify good food products,"* *"It's getting harder and harder to find your way around food products,"* and *"There is so much information on food products that one can feel more and more lost"* ($\alpha = .88$). We also measured their levels of cognitive load, using 3 items from Hunter & Goebel (2008): *"I feel frustrated by the amount of present information",*

“I feel overwhelmed by the amount of information I need to understand to buy effectively”, “I might buy the wrong product because of the amount of information to process”. We asked for each respondent’s level of cognitive dissonance using 4 items from Sweeney, Hausknecht and Soutar (2000): *“It would annoy me to buy this fish”, “I would ask myself if I’m making the right choice”, “I would wonder if there isn’t something wrong with this product?”, and “I would be embarrassed to have to make that decision”*.

In addition, we measured skepticism with 3 items from Hou & Sarigöllü (2022): *“I may be wrong about the information”, “I’m not sure I can trust the information” and “I should be wary of information”*. We finally measured environmental concern using three items from Iqbal et al. (2021): *“It is very important to me that the food has been prepared in an environmentally friendly way,” “It is very important to me that the food has been produced in a way that does not disturb the balance of nature” and “It is very important to me that the food is packed in an eco-friendly way”* ($\alpha = .91$),

To test our mediating hypotheses, we used the recommended indirect bootstrapping procedure (SPSS Macro Process Model 4, 5.000 bootstrap samples; Hayes, 2012) and included respondents’ age, gender, fish consumption frequency and environmental concern as covariates.

We conducted a mediation analysis with the addition of an Eco-Score E to a MSC label as the independent variable, cognitive load, cognitive dissonance and skepticism as mediators, and general confusion as dependent variable. We found a significant effect of the manipulation on cognitive load ($\beta = .41$, $SE = .14$, $t = 2.85$, $p = .003$), skepticism ($\beta = .38$, $SE = .12$, $t = 3.14$, $p = .001$) and cognitive dissonance ($\beta = .26$, $SE = .13$, $t = 1.97$, $p = .026$). The analysis shows a significant indirect effect through cognitive load ($ab = .1296$, $SE = .06$, 95% LLCI = .0241, 95% ULCI = .2794) and skepticism ($ab = .1286$, $SE = .06$, 95% LLCI = .0314, 95% ULCI = .2538) but not through cognitive dissonance as the confidence interval includes zero ($ab = .0251$, $SE = .04$, 95% LLCI = -.0436, 95% ULCI = .1172). We thus validate H1 and H3, but not H2.

We investigated a spillover effect where confusion about a specific product might lead to general confusion and then affect unrelated products. In our experiment, conflicting labels on fish triggered confusion, which could extend to bananas. Participants chose from three banana options (two conventional, one organic) while we measured specific-to-bananas confusion through self-reports and decision times, with longer times indicating higher cognitive effort (Cooper-Martin, 1994). This setup was repeated with apples, offering three similar options.

We found an indirect effect of conflicting labels on specific confusion for bananas ($ab = .14$, $SE = .07$, 95% LLCI = .0234, 95% ULCI = .3015) but not for apples ($ab = .09$, $SE = .06$, 95% LLCI = -.0088, 95% ULCI = .2120) through general confusion. This process is emphasized by the absence of direct effect of the conflicting labels on specific confusion for bananas ($\beta = .11$, $SE = .15$, $t = .72$, $p = .235$) and for apples ($\beta = .06$, $SE = .15$, $t = .41$, $p = .340$). In addition of these findings, an ANCOVA shows a significant difference in terms of time spent choosing both the bananas and apples between conflicting labels and control condition ($M_{MSC} = 35.27$, $M_{MSC+E} = 43.78$, $F_{(1,106)} = 5.07$, $p = .013$, $\eta^2 = .05$). This confirms H4 and the assumption that the confusion raised by conflicting labels gives rise to a spillover effect.

4. Discussion

Unlike prior research suggesting that cognitive load and dissonance are outcomes of consumer confusion, with trust moderating its effects (Chauhan & Sagar, 2021), our findings identify cognitive load and skepticism as key drivers of general confusion, evidenced by two serial mediations between opposite-valence labels and general confusion. Moreover, we found no clear link between cognitive dissonance and general confusion, despite an effect of the manipulation on cognitive dissonance, potentially due to consumer coping mechanisms. Future studies should investigate this relationship further.

Additionally, our findings reveal a spillover effect, where confusion about specific information leads to general confusion in food consumption, affecting unrelated products even without conflicting information—a novel contribution, as no prior research has explored this phenomenon in consumer confusion.

We would advise managers to consider carefully the use of several labels on packaging as cognitive load appears as an antecedent of confusion. Plus, consumers may feel skeptical about opposite-valence labels, this perceived conflict is due to a lack of food literacy, thus, public-policy makers should provide consumers with more educational content, and help them understand better each label's meaning.

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