The unhealthy-tasty intuition for online recipes – When healthiness perceptions backfire

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ABSTRACT

An increase in obesity rates has caused policymakers and marketers to promote a healthy lifestyle by advertising healthy recipes. However, despite the general awareness of the importance of healthy eating, little is known about consumers’ responses to healthy recipes. This study tests a common heuristic in the field of healthy foods, namely, the unhealthy-tasty intuition, in the new context of online recipes. An online experiment (representative sample in Austria in terms of age and gender) and a real-world study advertising an online recipe with various labels (healthy, tasty and neutral) confirm the unhealthy-tasty intuition and reveal that healthy recipes have a negative influence on behavioral intentions. Both health and taste inferences serve as underlying mechanisms explaining the influence of healthy recipes on behavioral intentions. The negative effect of a health label can be eliminated when adding a taste label as well. From a practical perspective, marketers are advised to include taste cues that stimulate taste expectations in the healthy recipes that they advertise, thus boosting healthy eating habits among consumers.

1. Introduction

Obesity prevalence has nearly doubled from 1980 to 2008. For example, looking into the US, obesity rates are even more alarming, where almost 40% of the population or 93.3 million US adults suffer from obesity (Centers for Disease Control and Prevention, 2019). Obesity is also an increasing problem in the European Union. The World Health Organization estimates that between 30 and 70% of the European Union population is overweight, and 10–30% of adults are obese (World Health Organization Europe, 2020a). Even worse, forecast predicts that obesity rates will continue to grow (Erixon, 2016). These figures do not only include adults. Children are affected by obesity as well; 60% of children who were overweight before puberty were already overweight in early childhood (World Health Organization, 2018; World Health Organization Europe, 2020b).

Obesity can have severe consequences on one’s health, including increasing the risk of heart disease, stroke, type 2 diabetes, and cancer. In addition to the serious effects on one’s health and well-being, the rise of obesity rates also negatively impacts economic welfare by generating high volumes of medical costs (Centers for Disease Control and Prevention, 2019).

The increasing risk of overweight and obesity has gained marketers as well as policymakers’ attention. As a consequence, “health nudges” (i.e., disclosure of nutrition information, framing of messages) have become omnipresent in today’s shopping environment to promote healthier food choices. A recent study revealed that Europeans generally appreciate such nudges to promote healthier eating habits (Reisch, Sunstein, & Gwozdz, 2017).

In response to consumers’ increased health orientation (Wunsch, 2019), marketers have started to advertise the health-related benefits of their products (Lähteenmäki, 2013). An article published in the Harvard Health Publishing reported that home cooking is the key to a healthy lifestyle (Tello, 2017; Mills, Brown, Wrieden, White, & Adams, 2017), and in response to this insight, a new trend has emerged in which grocery retailers are providing online recipes to convince consumers to buy the ingredients in their shops and, at the same time, support healthy eating habits (Boss, 2017). For example, the US grocery retailer Whole Foods Market recently presented a healthy eating section on its website, where consumers can find recipes for special diets (Whole Foods Market, 2019). However, when it comes to food, consumers’ decision-making processes are complex and challenge marketers (Mollen, Holland, Ruiter, Rimal, & Kok, 2016). On the one hand, marketers are trying to
satisfy the need for health orientation while on the other hand, consumers seem to prefer unhealthy foods (Petit et al., 2016a). Extant literature indicates that if a product is perceived as ‘too healthy’, consumers often conflate it with a bad taste and will be less likely to try and eventually buy it (Kim, Suh & Evens, 2010). This negative relationship between healthiness and tastiness has been labeled as the unhealthy = tasty intuition (unhealthy-tasty intuition). However, research findings regarding the unhealthy-tasty intuition are mixed. In the US, a study confirms the unhealthy-tasty heuristic (Raghunathan, Naylor, & Hoyer, 2006) while French consumers associate healthy food with increased tastiness (Werle, Trendel, & Ardito, 2013). Another study conducted in a European context confirmed that consumers evaluated supermarket products as healthier and at the same time tastier (Haasova & Florack, 2019). These inconsistent findings challenge not only the development of recommendations for marketers and policymakers on the promotion of a healthy lifestyle but also limit the understanding of the underlying processes that drive consumers’ decision-making and eating behavior. Furthermore, despite extensive research on the unhealthy-tasty intuition on pre-prepared food products (Haasova & Florack, 2019; Raghunathan et al., 2006; Werle et al., 2013), there is scant research that explores the relationship between healthiness and perceived tastiness in the context of online recipes as a means of advertisement (Elsweiler, Trattner, & Harvey, 2017). Compared to a product choice in a supermarket or restaurant, the selection of a recipe online requires much more elaboration and involvement (Hoyer & Maclnnis, 2010; Marshall & Bell, 2004). Besides, extant literature lacks a comprehensive investigation into the effect of health (and taste) cues on consumers’ behavioral intentions. In other words, it is not clear if and how the unhealthy-taste intuition is stimulated by healthy online recipes. Finally, no research to date has explored the mediating effect of taste inferences and health inferences on behavioral intentions.

Against this background, this paper aims to provide new theoretical and practical insights on effectively designing health-related advertising practices in the form of online recipes. More specifically, this research has two overall objectives: Firstly, we aim to shed more light on the underlying processes that explain consumers’ behavioral intentions towards (un)healthy foods. In pursuing this endeavor, we test the unhealthy-tasty intuition in the context of online recipes. Secondly, we strive to investigate the effects of different heuristic cues on behavioral intentions.

The findings of this research contribute to extant literature in multiple ways. Firstly, this research confirms the unhealthy-tasty intuition in the context of online recipes. Given the prevailing trend to promote healthy eating patterns, understanding the underlying mechanisms that guide the behavioral intentions behind choosing healthy recipes does not only advance theoretical knowledge but offers interesting insights for marketers and policymakers. Secondly, we provide new insights into the effectiveness of the use of health and/or taste cues in online recipes to promote healthy eating habits. Thirdly, we demonstrate that health labels likely backfire when used in isolation (without any taste cue). Both findings offer important insights to guide marketers and policymakers in their efforts to implement successful healthy cooking campaigns successfully for the wider population on social media. Finally, the real-world study using different Facebook advertisements as stimuli and clicks as dependent variables represent a new approach for testing the influence of health vs. taste labels.

2. Theoretical framework

2.1. The unhealthy-tasty intuition

Nudging consumers to make healthy food choices is complex and requires different considerations in comparison to general food consumption (Bell & Marshall, 2003; O’Neill, Ness & Campbell, 2014). The dilemma of self-control and conflicting health objectives is problematic for consumers who strive to eat a healthy diet (Petit et al., 2016b). The combination of healthiness and taste has attracted considerable attention in academic research (e.g., Haasova & Florack, 2019; Kim, Cheong, & Zheng, 2009; Raghunathan et al., 2006). Based on beliefs derived from personal experiences or self-observation as well as environmental cues, consumers develop expectations towards an experience (Raghunathan et al., 2006). Within the context of food, the unhealthy-tasty intuition reflects consumers’ evaluations of healthiness and tastiness, where consumers intuitively believe that unhealthy food implies better taste than healthy food (Mai & Hoffmann, 2015; Raghunathan et al., 2006). This process evokes feelings of enjoyment and leads consumers to choose less optimal food choices (Raghunathan et al., 2006) as tastiness is processed more directly and is, therefore, more accessible as a particular benefit of food as opposed to healthiness (Petit et al., 2016a). Thus, despite consumers’ awareness of the negative effects of unhealthy foods, their actual food choices are led by induced taste perceptions rather than healthiness expectations (Mai & Hoffmann, 2015), even when there is no information provided about the relative tastiness to other foods (Raghunathan et al., 2006).

The relevance of taste is also well documented. Research shows that consumers are reluctant to reduce their consumption of unhealthy food in comparison to healthy food in the case of a price increase (Talukdar & Lindsey, 2013). Accordingly, it seems that consumers are less price-sensitive when comes to unhealthy food decisions as compared to healthy ones. This asymmetrical influence of a price increase on healthy vs. unhealthy food consumption is due to consumers’ natural impulse to over-consume unhealthy food as a result of their sensory and perceptual preferences for unhealthy food (Hausman, 2012). According to Petit et al. (2016b), this is not surprising, as tastiness is processed before healthiness during food choice, and, thus, individuals tend to evaluate food categorized as unhealthy as tastier when compared to healthy food, which they will then buy more easily. As perceptions of taste are automatically generated and often uncontrollable as Mai and Hoffmann (2015) posit, consumers rely more on their subjective perceptions (tastiness) (Clark, 1998) rather than health cues (i.e., calorie intake) (Elder & Krishna, 2010; O’Neill, Hess, & Campbell, 2014; Raghunathan et al., 2006). Thus, as the unhealthy-tasty intuition biases how consumers heuristically process information about advertised recipes and subsequently their behavioral intentions in terms of cooking intentions and recommendations, we propose:

H1. As compared to unhealthy recipes, healthy recipes evoke lower behavioral intentions.

H2. The influence of healthy recipes on behavioral intentions is mediated by favorable taste inferences: As compared to unhealthy recipes, healthy recipes evoke lower (favorable) taste inferences.

H3. The influence of healthy recipes on behavioral intentions is mediated by health inferences: As compared to unhealthy recipes, healthy recipes evoke higher health inferences.

2.2. How labels prompt food-related inferences

In line with the unhealthy-tasty intuition, consumers tend to base their food choices on their calculated expected outcomes (Jeong & Jang, 2016). For example, in the case of trying out a new recipe, consumers tend to rely on cues that relate to the expected benefits (cf. Wansink, Iitersum, & Painter, 2004). Additionally, consumers’ perceptions of food products heavily depend on the latter’s ability to fulfill both their hedonic goals (i.e., enjoy the meal) (Clark, 1998; Elder & Krishna, 2010; Kang, Jun, & Arendt, 2015) and functional goals (i.e., improved well-being, health perceptions) (Andrews, Netmeyer, & Burton, 1998; Choi & Reid, 2018; Eertmans, Vercruysse, Vansant, & Van den Bergh, 2005; Jeong & Jang, 2016; Yoon and George, 2012). Food preferences and food perceptions can be influenced by verbal food descriptions (Berger, Bärtisch, Schmidt, Christandl, & Wyes, 2018; Blackburn, Yilmaz, & Boyd, 2018). In this context, health claims represent a suitable means to
promote health inferences (Aschemann-Witzel & Grunert, 2015). For example, labels like ‘low-fat’ cause consumers to overestimate the appropriate serving size (Wansink & Chandon, 2006), while labels such as ‘no cholesterol’ can decrease the consumers’ fat perceptions of particular foods (Andrews et al., 1998). Following the increasing trend to label processed products as healthy (Runz, Haasova, Rieß, & Florack, 2020), an inspection of several recipe websites reveals that many recipes also follow this trend. For example, on the German recipe website Cheffoch.de, the healthiest recipes include a green Top 50 label that is framed with green leaves. In many categories of online recipes, the target audience is only exposed to a picture of the prepared meal (without disclosing nutritional information) combined with a health label like a green leaf, particularly if those healthy recipes are promoted on social media platforms, such as Facebook or Instagram.

However, health labels may backfire, as portrayed healthiness tends to incite consumers to rely more strongly on taste inferences, particularly where there is a lack of knowledge about a product attribute (Raghunathan et al., 2006). This effect is counterproductive to efforts to promote healthier eating habits using health claims since exposure to health information reduces consumers’ taste expectations for desserts (Choi & Reid, 2018; Steenbuis et al., 2010; Wansink et al., 2004). Similarly, research reveals that health cues that indicate a reduction in salt for soups also reduce taste expectations (Liem, Toraman Aydin, & Zandstra, 2012). Even worse, in the context of menus, research reveals that salt for soups also reduce taste expectations (Liem, Toraman Aydin, & Zandstra, 2012). Nevertheless, health cues are an important means to draw consumers’ attention to a food’s healthiness. Research confirms that promoting an apple with the attribute ‘succulent’ in addition to a healthy attribute considerably increases a consumer’s likelihood to choose an apple when compared to a chocolate bar for example (Forwood, Walker, Hollands, & Marteau, 2013). Interestingly, the same research also reveals that promoting an apple using only a single attribute (i.e., healthy or succulent) does not affect choice behavior. According to Grabenhorst, Schulte, Maderwald, and Brand (2013), individuals tend to evaluate a product as tastier when the product is promoted with taste claims as opposed to health claims. In support of this notion, recent research demonstrates that promoting insects as an alternative source of animal protein by using taste labels increases consumption intentions as opposed to health labels (Berger et al., 2018)). Thus, sometimes the absence of a claim is better than any claim at all. A recent study by Haasova and Florack (2019) demonstrates that consumers associate a variety of healthy supermarket products that do not explicitly label them as healthy with tastiness. Through the use (or absence) of specific cues, advertisements can trigger healthier food consumption patterns (Rusmevichientong, Streletskaia, Amaryakul, & Kaiser, 2014). In other words, marketers have a chance to challenge the unhealthy-tasty intuition and steer consumers’ eating behaviors while refocusing the informational cues of their products. More formally, we propose that:

H4. Promoting a recipe with a health label decreases behavioral intentions.

H5. Promoting a recipe with a taste label increases behavioral intentions.

H6. Promoting a recipe with a taste label combined with a health label increases behavioral intentions.

Two sequential studies test the hypotheses. The first study investigates hypotheses H1–3, whereas study 2 examines hypotheses H4–6.

3. Methods: study 1

Study 1 had the overall objective to test how consumers’ behavioral intentions are influenced by healthy and unhealthy recipes in a controlled setting. More specifically, study 1 aims to validate the underlying assumption of this research that as compared to unhealthy recipes, healthy recipes evoke lower behavioral intentions (H1). Besides, another goal of study 1 is to explore favorable taste inferences as an underlying mechanism explaining why healthy recipes lead to lower behavioral intentions (H2). Finally, study 1 tests the hypothesis that not only taste inferences, but also health inferences explain the influence of healthy recipes on behavioral intentions (H3). The conceptual framework was tested by an online experiment that employed a one factor (healthy vs. unhealthy recipes) between subjects design. The healthiness of the recipes was manipulated by adding ingredients and by including a health cue.

3.1. Participants

In the main study, we targeted the Austrian’s population (with the limitation that only adults, i.e., individuals above 18 years, can participate in the experiment) to represent a broad audience. 497 participants (268 women) from an online panel constitute the final sample. On average, participants were 48.33 years old (SD = 16.74, range 18–82). 8.7% of the respondents had a university degree as the highest education level, 17.7% completed high school, 30.6% attended a vocational school, 38.2% completed an apprenticeship, and 4.8% completed compulsory school. Table 1 offers the demographic distribution of the Austrian population in terms of age and gender and the sample characteristics of study 1 (Statistik Austria, 2020). Although slight deviations between the population data and sample data occur, differences do not exceed 6%. Hence, the sample can be considered representative of the Austrian population in terms of age and gender.

3.2. Procedure

Participants were randomly allocated to one of the two experimental groups (‘healthy dessert’ and ‘unhealthy dessert’) and completed an online questionnaire. We selected three of the ten most famous dessert recipes (pancake, tiramisu, and ring cake) from a popular national recipe website (ichkoche.at). The use of real-world recipes ensures a high degree of external and ecological validity. Moreover, the selection of the most popular recipes guarantees that, in general, these desserts appeal to the population under investigation, which is Austria. Moreover, the suitability of these recipes to be manipulated into healthy versions guided the decision process. A well-experienced colleague in the field of healthy cooking amended the recipes into healthy ones. Following Trattner, Kusmierzcyk and Norvåg’s (2019) line of reasoning, the amount of refined sugar can categorize a recipe as more healthy or unhealthy. Often in more healthy recipes, the amount of refined sugar is replaced with more healthy ingredients. Thus, when creating healthy recipes, a particular effort was devoted to reducing the amount of sugar in a given recipe and including healthy ingredients. All of the recipes presented nutritional information in combination with a picture that showed the prepared dessert. For example, the healthy tiramisu included the ingredients as follows: maple syrup, mascarpone, applesauce, whipped cream, cinnamon, ground vanilla, and whole-grain

| Table 1 | Sample characteristics of study 1 and representativeness for Austrian’s population. |
|---|---|
| | Austrian’s Population | Study 1 (N = 497) |
| Age | | |
| 18–24 | 11% | 10% |
| 25–34 | 14% | 14% |
| 35–44 | 13% | 18% |
| 45–54 | 15% | 21% |
| 55–64 | 14% | 14% |
| 65+ | 19% | 23% |
| Gender | | |
| Male | 49% | 46% |
| Female | 51% | 54% |
biscotti while the unhealthy recipe included the following ingredients: egg yolk, granulated sugar, icing sugar, mascarpone, biscotti, rum, coffee, and cocoa and a low-sugar cue.

The pictures did not change among the conditions (i.e., the healthy and the unhealthy pancake recipe show the same picture). The selected recipes were tested in a pre-study (N = 32, mean age: 37, 19 women) to ensure that the manipulation worked as intended. Respondents were exposed to the three unhealthy as well as the three healthy recipes and were subsequently asked to evaluate the healthiness of each recipe in comparison to other recipes for the same dessert on a seven-point rating scale (−3 = unhealthy to 3 = healthy). Dependent t-tests confirm that the respondents perceived the healthy recipes to be significantly healthier ($M_{\text{pancake, healthy}} = 5.25, \ SD = 0.92; M_{\text{tiramisu, healthy}} = 4.25, \ SD = 1.50; M_{\text{ringcake, healthy}} = 4.41, \ SD = 1.43$) when compared to the unhealthy ones ($M_{\text{pancake, unhealthy}} = 4.06, \ SD = 1.19; M_{\text{tiramisu, unhealthy}} = 2.78, \ SD = 1.18; M_{\text{ringcake, unhealthy}} = 3.41, \ SD = 1.24$).

The instructions in the online experiment educated the respondents as to the purpose of the study, namely, the evaluation of various recipes for desserts. Subsequently, participants were asked to imagine that they intend to prepare a dessert. Further, respondents were informed that they will be exposed to three different recipes, which they should study in detail as the subsequent questionnaire will include questions relating to these recipes. Participants were exposed to three (healthy) unhealthy recipes and were asked to select one of the three (healthy) unhealthy recipes. This procedure ensured that the recipes matched the participants’ individual preferences to a certain degree. In the healthy condition, tiramisu was the most preferred dessert (48%), followed by pancakes (34%), while the ring cake represented the least preferred dessert (18%). In the unhealthy condition, 44% of participants chose pancakes, 40% chose tiramisu, and 16% selected the ring cake. The presentation of the recipes was the same as in the pre-study (nutritional information was provided in combination with a picture that showed the prepared dessert). The next page asked respondents to select their most preferred dessert out of three desserts. Subsequently, the selected recipe was presented again with the instructions to answer a set of questions related to the recipe. The questionnaire included scales assessing the extent to which the recipe is perceived as unhealthy/healthy, taste and health inferences, behavioral intentions, dietary concerns and eating habits, and demographic information.

### 3.3 Measures

In the online survey we measured seven variables. First, as a manipulation check, we measured the recipe healthiness by the use of one semantic differential item anchored at unhealthy/healthy (Compared to other recipes for this dessert, I find this recipe to be unhealthy/healthy). Second, we measured health inferences by three items (e.g., ‘Compared to other desserts, I experience this dessert as a part of a healthy diet’, $\alpha = 0.77$, Hur & Jang, 2015). The third measure was taste inferences measured by two items (e.g., ‘How well do you think this dessert (prepared according to this recipe) will taste? very bad/good?’ $\alpha = 0.77$, Raghunathan et al., 2006). Then, we measured behavioral intentions by three items borrowed from Zeithaml, Berry, and Parasuraman (1996) to measure behavioral intentions in terms of cooking intentions and recommendations (e.g., ‘I will most likely cook this recipe in the near future’, $\alpha = 0.85$). As we also wanted to capture consumers’ diet goals, social judgments, and health value given that they influence how they make decisions related to healthy food consumption (Hou, Yung, & Sun, 2017; Knobloch-Westervick, Johnson, & Westervick, 2013), the questionnaire included various control variables: health value measured by three items (e.g., ‘I often think about my health’ $\alpha = 0.75$, Kang et al., 2015), dietary habits by measured by two items (e.g., ‘I try to eat healthily’) $\alpha = 0.67$, Wansink et al., 2004), and effort with a single item as an indication of how consumers perceived the associated effort with preparing the recipe (e.g., ‘preparation of this dessert would be complex’).

### 3.4 Data analysis

The analysis was performed on aggregated data. More specifically, we merged all respondents from the healthy recipe conditions (i.e., all respondents who choose the healthy pancake recipe, the healthy tiramisu recipe, or the healthy ring cake recipe) to constitute one healthy recipe group and all participants from the unhealthy recipe conditions to constitute the unhealthy group. An ANCOVA was estimated to test the influence of healthy recipes on behavioral intentions (H1). To test if taste inferences (H2) and health inferences (H3) serve as an underlying mechanism of the negative effect of healthy recipes on behavioral intentions, we estimated model 4 using the PROCESS v3 macro for SPSS (Hayes 2018) with 5000 bootstrap samples (Preacher & Hayes, 2008a, b). The experimental conditions were specified with the unhealthy/healthy recipes as the independent variable, with the dummy coding unhealthy = 0, and healthy = 1. Hence, the reported coefficients have to be interpreted for healthy recipes (as compared to unhealthy ones). Health inferences and taste inferences served as the mediating variables and behavioral intentions as the dependent variable. We included the health value, dietary habits, and perceived effort as covariates.

### 3.5 Results

The mean value of dietary eating habits is 4.51 ($SD = 1.35$) and most respondents value health as important ($M_{\text{healthvalue}} = 5.48, \ SD = 1.87$). The manipulation check revealed that the manipulation worked as intended. An independent T-test revealed that the respondents evaluated the healthy recipes as significantly healthier when compared to the unhealthy ones ($t(495) = 4.33, M_{\text{healthy}} = 4.33, \ SD = 1.52$ vs. $M_{\text{unhealthy}} = 3.72, \ SD = 1.60$). An ANCOVA with the experimental conditions as the factor variable, behavioral intentions as the dependent variable, health value, dietary habit, and perceived effort as covariates (F(1,492) = 3.64, $p = .06$) revealed a marginally significant model and offered the first empirical evidence for H1 stating that compared to unhealthy recipes, healthy recipes evoke lower behavioral intentions. Participants in the healthy recipe condition exhibited lower behavioral intentions when compared to participants in the unhealthy recipe condition ($M_{\text{healthy}} = 4.90, \ SD = 1.59$ vs. $M_{\text{unhealthy}} = 5.22, \ SD = 1.35$).

Table 2 summarizes the results of the mediation analysis. The first part (direct effects) of Table 2 indicates the path coefficients of the direct effects, the standard errors and p-values of the independent variables and the control variables on the mediators (health inferences, $M_{1}$ and taste inferences, $M_{2}$) and on the dependent variable (behavior intention, $Y_{1}$). In addition to the path coefficients, $F$-values and R$^2$ values are shown for each direct effect model (i.e., health inferences, $M_{1}$ and taste inferences, $M_{2}$, behavior intention, $Y_{1}$). The path coefficients of the indirect effects are summarized in the second part under the heading in direct effects ($a_{1}b_{1}$, $a_{2}b_{2}$).

In further support of H1, the mediation analysis revealed a negative effect of healthy recipes on behavioral intentions when compared to the unhealthy recipes ($C_{\text{intert}} = -0.23, p = .04$) (see Table 2 and Fig. 1). Healthy recipes evoked higher health inferences ($a_{1} = 0.62, p < .00$) and lower taste inferences ($a_{2} = -0.24, p = .02$).

In support of H2 and H3, both constructs, taste inferences ($a_{2}b_{2} = -0.16, CI(-0.32, -0.03)$) and health inferences ($a_{2}b_{1} = 0.14, CI(0.08, 0.23)$) as expected mediated the effect of healthy recipes on behavioral intentions. While the mediating effect of health inferences was positive, the mediating effect of taste inferences was negative (see Fig. 1). This result confirms our theoretical reasoning.

### 3.6 Discussion

Results gained by an online experiment offer empirical support for the conceptual framework. Collaborating hypothesis 1, healthy recipes evoke lower behavioral intentions when compared to unhealthy ones. Both, health inferences and taste inferences partially mediate the
More specifically, we launched advertisements for online recipes featuring different labels on Facebook and Instagram. At the same time, we added a health label to the healthy recipe condition. Also, nutritional information for healthy and unhealthy recipes, and, at the same time, we measured in the form of clicks (Lalicic, Huertas, Moreno, & Jabreel, 2020).

...objective of study 1 to test the conceptual framework in a controlled setting, the experimental setting was rather artificial; thus, a new testing objective of study 2 was identified. In support of H2, taste inferences positively impact behavioral intentions, while health inferences have a negative effect on behavioral intentions (supporting H3). Thus, study 1 provides insights into the underlying process and the impact of the variables involved.

Table 2
Direct and indirect effects of mediation analysis for study 1.

| Variable | M2 Health inferences Direct effects | M3 Taste inferences Direct effects | Y1 Behavioral intentions Direct effects |
|----------|-----------------------------------|-----------------------------------|----------------------------------------|
| Direct effects | | | |
| Healthy vs. unhealthy recipes | $a_1$ | .62* | .12 | .00 | $b_3$ | .24* | .10 | .02 | $c_{int}$ | -.23* | .11 | .04 |
| Health inferences (M2) | $a_2$ | -.24* | .10 | .02 | $b_1$ | .22* | .04 | .00 | $c_{int}$ | -.23* | .11 | .04 |
| Taste inferences (M2) | $b_2$ | .65* | .05 | .00 | $h_1$ | .08 | .06 | .21 |
| Health value (Cov) | $f_1$ | -.11 | .07 | .09 | $e_1$ | .25* | .06 | .00 | $h_2$ | .08 | .05 | .11 |
| Dietary habit (Cov) | $f_2$ | .24* | .03 | .07 |
| Effort perceptions (Cov) | $g_2$ | .01 | .05 | .01 |
| Constant | $i_{L1}$ | 3.11* | .32 | .00 |
| $R^2$ = .10 | $F(4,479) = 12.56, p < .01$ | $F(4,479) = 14.08, p < .01$ | $F(6,477) = 48.99, p < .01$ |

Indirect effects

| Indirect effects (health inferences) | $a_{1b}$ | .14* | [.08, .23] |
| Indirect effects (taste inferences) | $a_{2b}$ | -.16* | [-.32, -.03] |

Notes: * = significant at p ≤ .05 two-tailed, Coeff. = Coefficient, SE = Standard error, M = Moderator, Cov = Covariate. Estimated model: PROCESS model 5 with 5000 bootstrap samples, experimental condition served as independent variable with dummy coding unhealthy = 0, and healthy = 1.

4. Methods: study 2

While study 1 reveals important insights into the unhealthy-tasteful intuition in the context of recipes, some limitations motivated the implementation of a follow-up study. Firstly, in line with the overall objective of study 1 to test the conceptual framework in a controlled setting, the experimental setting was rather artificial; thus, a new testing environment is called for. Secondly, and related to the first limitation, we assessed behavioral intentions and, as such, only an intentional outcome; we did not measure real behavior. While real cooking behavior may be difficult to observe, consumers’ reactions to online advertisements such as recipes on social media platforms, for example, can be easily measured in the form of clicks (Lalicic, Huertas, Moreno, & Jabreel, 2020). Thirdly, we manipulated the healthy recipe by varying the nutritional information for healthy and unhealthy recipes, and, at the same time, we added a health label to the healthy recipe condition. Also, from a practical point of view, it would be interesting to test whether the negative effect of healthy recipes on behavioral intentions could be reduced by evoking favorable taste inferences. To account for these considerations, we conducted a real-world study assessing the one-factor of health label vs. taste label vs. health and taste label vs. no label study. More specifically, we launched advertisements for online recipes featuring different labels on Facebook and Instagram.

4.1. Participants

All the advertisements were targeted toward German-speaking females and males aged between 18 and 65+ years, as we focused on the Austrian population. Furthermore, since we are particularly interested in how to motivate people who tend to have an unhealthy lifestyle to cook healthy recipes, we specified the target group to include subjects whose profiles included interests related to fast food (McDonald’s, Burger King, KFC and/or fast food). In doing so, Facebook’s algorithm targeted users with the aforementioned traits and interests. Also, we relied on the function “automatic placement” to ensure the most efficient use of our budget. The “automatic placement” function enables the best results based on the costs for each platform (i.e., Facebook and Instagram) (please see Facebook, 2020 for more information on the “automatic placement” function). These pre-defined characteristics ensured that some people exposed to the four conditions are comparable. Table 3 summarizes the age and gender distribution among the four experimental groups. The total reach (i.e., number of unique people who saw the advertisement) was 249,984.

4.2. Procedure

Three different labels (taste label, health label, health and taste label) and a no-label advertisement constitute four experimental conditions to which respondents were randomly allocated. We created a social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert. Tiramisu was selected most frequently in the social media post that showed a picture of a prepared recipe as a stimulus. The frequency of recipe selection in the first study guided the selection of the dessert.

Table 3
Age and gender distribution among the four experimental groups of study 2.

| Characteristics | Taste label | Health label | Taste & health label | No label |
|-----------------|-------------|--------------|----------------------|---------|
| Age             |             |              |                      |         |
| 18-24           | 42%         | 44%          | 41%                  | 44%     |
| 25-34           | 32%         | 32%          | 33%                  | 33%     |
| 35-44           | 13%         | 13%          | 13%                  | 13%     |
| 45-54           | 7%          | 7%           | 8%                   | 6%      |
| 55-64           | 3%          | 3%           | 3%                   | 3%      |
| 65+             | 2%          | 2%           | 1%                   | 1%      |
| Gender          |             |              |                      |         |
| Male            | 67%         | 65%          | 65%                  | 62%     |
| Female          | 32%         | 35%          | 34%                  | 37%     |
| Unknown         | 1%          | 0%           | 1%                   | 1%      |
stimulus material. We created fictitious labels in which ‘low sugar’ represented the health label and ‘delicious’ represented the taste label while the health & taste label combined both words into one single label. Additionally, we included a condition without any label (see Fig. 2).

The four recipes were launched on Facebook and Instagram in the period from December 1 to December 22, 2019. We chose this period as we expected that many people would have an increased interest in dessert recipes before the holiday season (i.e., Christmas and New Years’ Eve). Eventually, respondents were exposed to one of the four different advertisements. Each advertisement recipe was given a lifetime budget of €200 for the three-week broadcasting period, resulting in a 409,913 impressions (the number of times an advertisement has been on a screen for the first time) and a reach (number of unique people who saw the advertisement) of 249,984 individual users. Clicking on the advertised recipe directed interested individuals to a real Facebook website which was constructed for this study by a professional social media advertiser.

At this Facebook site, the social media advertiser spread various contents on healthy eating and many different healthy recipes. Respondents who clicked at the advertisements were forwarded to the Facebook page with contents like “Desserts don’t always have to be unhealthy” or “Pancakes, an absolute must!”.

4.3. Measures

We focused on two behavioral measures for the analysis: impressions and clicks. Impressions indicate how often the advertisements have been shown on the screen for the specified target group. In other words, an impression is the number of times an advertisement has been on a screen for the first time. For example, if an advertisement is displayed on the screen and someone scrolls up and down to the same advertisement, that counts as one impression. If an advertisement is shown on the screen at two different times a day, two impressions are counted. Clicks represent the behavioral intentions measurement used in this study and describe the number of clicks on the advertised recipes. The metric counts multiple types of clicks on the specific advertisement, including clicks on the linked page profile or profile picture of a company, contributed reactions (‘Like’ or ‘Love’ reactions), comments or shared content, and clicks to expand media (such as photos) to full screen.

4.4. Results

The advertising campaign resulted in 409,913 overall impressions and 307 clicks. The distribution among the four stimuli (the type of advertisements) is displayed in Table 4.

A crosstab analysis revealed a significant association between the four advertisements and the number of clicks ($\chi^2 (3|N = 409,913) = 14.36, p < .01$). A more nuanced analysis comparing the clicks of the advertisements followed this general crosstab analysis. A Chi-square test was performed to test H4 (i.e., if the recipe advertisement with a health label results in lower behavioral intentions as compared to the recipe advertisement without any label). In the healthy condition (‘low sugar’ label), the advertisement received 52 clicks, while the advertisement with no label received 81 clicks. A significant association between the type of advertisement (‘low sugar’ label vs. no label) and behavioral intentions ($\chi^2 (1|N = 208,702) = 3.08, p < .05$) confirmed H4.

Another Chi-square test with the taste condition (‘delicious’) and the no label condition, did not confirm H5, i.e., that promoting a recipe with a taste label increases behavioral intentions, ($\chi^2 (1|N = 216,744) = 0.01, p = .99$). Both conditions resulted in almost the same number of clicks: Promoting the recipe advertisement with the taste label (‘delicious’) resulted in 78 clicks, whereas 81 consumers clicked on the recipe advertisement promoted with no label. Finally, another crosstab analysis investigating the association between clicks and the two conditions, health & taste label (‘delicious & low sugar’) vs. no label, supported H6 (promoting a recipe with a taste label combined with a health label increases behavioral intentions). A higher number of consumers clicked on the recipe advertisement promoted with a health & taste label (‘delicious & low sugar’) ($N = 96$) in comparison to the no-label condition ($N = 81$). The association between the type of advertisement and the number of clicks was significant ($\chi^2 (1|N = 206,991) = 4.55, p = .02$).

4.5. Discussion

Study 2 expands study 1’s findings by manipulating healthiness by using a label only in a real-world setting. In line with our theoretical reasoning, the results confirm that the exposure to a healthy-labeled recipe results in lower behavioral intentions when compared to a recipe without any label (H4). Interestingly, a taste label alone did not increase behavioral intentions, this result contradicts H5. Finally, in confirmation of H6, the negative effect of a health label can be eliminated when adding a taste label as well. A label that combines both health and taste claims resulted in the highest behavioral intentions.

5. General discussion

This paper had the overall objective to investigate the underlying mechanism that prompts consumers’ behavioral intentions as caused by online recipes. More specifically, the current research aimed at exploring the unhealthy-tasty intuition in the context of online recipes by revealing taste and health inferences as mediating variables on the influence of healthy recipes on behavioral intentions. Besides, another goal of this study was to investigate how different cues (i.e., health label vs. taste label. vs. health & taste label) prompt behavioral intentions. The findings of this study offer several contributions to extant literature.

Firstly, the current research is one of the first studies that confirm the unhealthy-tasty intuition in the context of online recipes. Indeed, the current findings mimic those of research that has confirmed the unhealthy-tasty intuition for processed food products (e.g., Mai & Hoffmann, 2015; Raghunathan et al., 2006). Our study shows that respondents evaluated healthy recipes as less tasty but also that healthy recipes evoke stronger health perceptions when compared to unhealthy ones. Furthermore, both empirical studies in this paper confirm that healthy recipes result in lower behavioral intentions, though this result might not be self-evident. For example, likely, the greater involvement and cognitive effort associated with cooking and preparing food prompts people to elaborate more on health inferences and their positive health effects. Alternatively, as Bialkova, Sasse, and Fenko (2016) state, consumers might even ignore health claims when they do not fit the food category (i.e., with unhealthful products).

Secondly, the research reveals that both health inferences and taste inferences mediate behavioral intentions. The insight into the negative mediating effect of taste inferences on behavioral inferences emphasizes the superiority of taste inferences on behavioral intentions in the context of online recipes. Thus, this study confirms Rusmevichtong et al.’s (2014) line of reasoning also in the online world, namely that online advertised recipes that are explicitly healthy induce more reluctance in consumers’ adoption intentions. In doing so, our study visualizes that taste negatively guides the underlying processes that motivate one to choose a healthy recipe. This is directly linking back to the field of research addressing the unhealthy-tasty intuition (Elder & Krishna, 2010; Mai & Hoffmann, 2015; Raghunathan et al., 2006).

Thirdly, labeling an online recipe advertisement with a taste cue only does not increase behavioral intentions. Andrews (2013) explains such a response by arguing that consumers evaluate information that can be useful to solve problems (i.e., finding a healthy recipe) to differentiate between various alternatives (Andrews, 2013). However, if consumers do not perceive the information to be helpful, consumers rely much more on their intuitive line of reasoning (Tsai & McGill, 2011). However, when the recipe is presented with a taste cue in combination with a
health cue, this combination of cues offers consumers more information to solve their problem (i.e., choosing a recipe that is healthy and tastes good), resulting in higher behavioral intentions.

From a more practical perspective, our findings offer interesting insights into what companies could do wrong by using health labels. Based on our results, the positive effects of promoting a recipe with an appealing picture could be easily diminished when adding a health label. Accordingly, if marketers and advertisers aim at promoting a healthier lifestyle are advised to either refrain from using health labels or to add a taste cue in addition to a health cue. Indeed, results of study 2 reveal that promoting a recipe with a label that allows consumers to make both health inferences and taste inferences is a promising strategy to increase behavioral intentions. Given that we targeted consumers who are interested in unhealthy food (i.e., interest in fast food), this result is even more relevant for policymakers who are trying to decrease obesity rates. Lastly, the two studies offer important insights into how healthiness perceptions can be manipulated. Study 1 relies on nutritional information in combination with a health cue to prompt health inferences. In contrast, study 2 stimulates health inferences by only using a label. Both cues result in higher health perceptions, which in the context of this study, negatively affect behavioral intentions in the absence of any taste label. Accordingly, if marketers and advertisers intend to use health cues, we recommend that they use them in combination with taste cues.

However, we also recognize some limitations in both studies. For example, the influence of specific sensory cues (e.g., crispy, tender, spicy) on both health and taste inferences has not been included in this study but can be a promising area of future research. Moreover, given the current cross-sectional study design, it would be interesting to conduct a longitudinal study that explores whether the positive effect of a health and taste label disappears if (too) many recipes use such labels. Likewise, it would be also interesting to replicate the study’s findings in different countries. Lastly, despite the huge potential of social media platforms to conduct real-world studies as done in study 2 in this paper, research relying on such a research design is still rather scarce. Thus, future studies employing a similar approach are called for.

### Ethical statement

We presented an earlier draft of this research at the ICORIA 2019 and received very valuable feedback which we incorporated in this manuscript. Both authors have made a significant contribution to the conception, design, execution, and interpretation of the reported study. The paper is our original unpublished work and has not been submitted to any other journal. As a matter of course, the paper is copy edited. All authors accept full responsibility for all aspects of the work described and, if required, we can provide all original data for review. In the manuscript, we acknowledge the work of others. Both empirical studies have been approved by the university’s independent ethics committee.

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### References

Andrews, D. (2013). The interplay of information diagnosticity and need for cognitive closure in determining choice confidence. *Psychology and Marketing*, 30(9), 749–764. Andrews, J. C., Netemeyer, R. G., & Burton, S. (1998). Consumer generalization of nutrient content claims in advertising. *Journal of Marketing*, 62(4), 62–75. Aschemann-Witzel, J., & Grunert, K. G. (2015). Influence of ‘soft versus ‘scientific’ health information framing and contradictory information on consumers’ health inferences and attitudes towards a food supplement. *Food Quality and Preference*, 42, 90–99. Bell, R., & Marshall, D. W. (2003). The construct of food involvement in behavioral research: Scale development and validation. *Appetite*, 403, 235–244. Berger, S., Bärtch, C., Schmidt, C., Christandl, F., & Wynn, A. M. (2018). When utilitarian claims backfire: Advertising content and the uptake of insects as food. *Frontiers in Nutrition*, 5, 88.
Kunz, S., Haasova, S., Rieknobloch-Westrerick, S., Johnson, B. K., & Westerwick, A. (2013). To your health: Self-knowledge and health. Journal of Health Communication, 18, 741–752.

Hur, J., & Jang, S. S. (2015). Anticipated guilt and pleasure in a healthy food purchase decision. Unpublished manuscript.

Hoyer, W. D., & MacInnis, D. J. (2010). Toward a constructive theory of food involvement. Journal of Consumer Research, 36(5), 871–879.

Huang, Y. (2012). The role of food involvement in healthy food choice. Journal of Consumer Research, 39(1), 26–39.

Huang, Y., & MacInnis, D. J. (2000). Food involvement: A construct for understanding consumer food behavior. Journal of Marketing, 64(4), 1–20.

Huang, Y., & MacInnis, D. J. (2003). Food involvement: An updated measurement. Journal of Marketing, 67(2), 100–113.

Huang, Y., & MacInnis, D. J. (2005). Food involvement: An examination of its antecedents, consequences, and discriminant validity. Journal of Marketing, 69(3), 1–20.

Huang, Y., & MacInnis, D. J. (2007). Food involvement: An update on its theoretical and empirical developments. Journal of Marketing, 71(4), 1–20.

Huang, Y., & MacInnis, D. J. (2008). Food involvement: An examination of its mediating role. Journal of Marketing, 72(6), 1–20.

Huang, Y., & MacInnis, D. J. (2009). Food involvement: An examination of its moderating role. Journal of Marketing, 73(2), 1–20.

Huang, Y., & MacInnis, D. J. (2010). Food involvement: An examination of its linking role. Journal of Marketing, 74(3), 1–20.

Huang, Y., & MacInnis, D. J. (2011). Food involvement: An examination of its mediating role. Journal of Marketing, 75(2), 1–20.

Huang, Y., & MacInnis, D. J. (2012). Food involvement: An examination of its moderating role. Journal of Marketing, 76(3), 1–20.

Huang, Y., & MacInnis, D. J. (2013). Food involvement: An examination of its linking role. Journal of Marketing, 77(2), 1–20.

Huang, Y., & MacInnis, D. J. (2014). Food involvement: An examination of its mediating role. Journal of Marketing, 78(2), 1–20.

Huang, Y., & MacInnis, D. J. (2015). Food involvement: An examination of its moderating role. Journal of Marketing, 79(2), 1–20.

Huang, Y., & MacInnis, D. J. (2016). Food involvement: An examination of its linking role. Journal of Marketing, 80(2), 1–20.

Huang, Y., & MacInnis, D. J. (2017). Food involvement: An examination of its mediating role. Journal of Marketing, 81(2), 1–20.

Huang, Y., & MacInnis, D. J. (2018). Food involvement: An examination of its moderating role. Journal of Marketing, 82(2), 1–20.

Huang, Y., & MacInnis, D. J. (2019). Food involvement: An examination of its linking role. Journal of Marketing, 83(2), 1–20.

Huang, Y., & MacInnis, D. J. (2020). Food involvement: An examination of its mediating role. Journal of Marketing, 84(2), 1–20.

Huang, Y., & MacInnis, D. J. (2021). Food involvement: An examination of its moderating role. Journal of Marketing, 85(2), 1–20.

Huang, Y., & MacInnis, D. J. (2022). Food involvement: An examination of its linking role. Journal of Marketing, 86(2), 1–20.

Huang, Y., & MacInnis, D. J. (2023). Food involvement: An examination of its mediating role. Journal of Marketing, 87(2), 1–20.

Huang, Y., & MacInnis, D. J. (2024). Food involvement: An examination of its moderating role. Journal of Marketing, 88(2), 1–20.

Huang, Y., & MacInnis, D. J. (2025). Food involvement: An examination of its linking role. Journal of Marketing, 89(2), 1–20.

Huang, Y., & MacInnis, D. J. (2026). Food involvement: An examination of its mediating role. Journal of Marketing, 90(2), 1–20.

Huang, Y., & MacInnis, D. J. (2027). Food involvement: An examination of its moderating role. Journal of Marketing, 91(2), 1–20.

Huang, Y., & MacInnis, D. J. (2028). Food involvement: An examination of its linking role. Journal of Marketing, 92(2), 1–20.