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The Influence of Consumption Context on Indulgent Versus Healthy Yoghurts: Exploring the Relationship between the Associated Emotions and the Actual Choices

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Abstract: This work examines the associated emotions of consumers transmitted from extrinsic attributes (fat-related nutrition claims (full-fat, low-fat, and fat-free) and ingredient features (plain, berries, and double chocolate chunk)) labelled on yoghurt packages. It differentiates by consumption context (health versus indulgent) at the time of the survey and studies the relationship between the associated emotions (e.g., positive versus negative) attached to extrinsic attributes and the actual choices. The research was conducted in the Netherlands in 2019, with 209 regular consumers of yoghurt. Participants were divided into two treatments according to each consumption context and a control group (no context); they were instructed to imagine purchasing yoghurt to consume it as a healthy snack or as a dessert or received no instructions. After choosing their preferred option from a discrete choice experiment, participants indicated how the choice made them feel from a list of emotions. The results revealed significant differences between positive emotional profiles for choosing healthy (low-fat) yoghurts with berries and negative profiles for choosing less healthy alternatives (full-fat) with double chocolate chunk sensory features. The findings from a random parameter logit model showed that participants who continuously chose the same type of yoghurt in all choice tasks selected mostly positive rather than negative emotions. The overall findings suggest that the associated emotions affect yoghurt choices. However, the emotions were mainly affected by the consumption context.

Keywords: food choices; associated emotions; yoghurt; healthy; indulgent



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1. Introduction

In the last decade, increased consumer awareness of healthy eating [1] has stimulated food companies to reformulate their existing food products and market them as healthier alternatives [2]. Conceptually, these healthier alternatives are marketed as an “improved” version of food generally perceived as less healthful, often consumed for either convenience (e.g., a pack of low-salt potato chips to satisfy current hunger), and/or indulgence (e.g., a pack of sour cream and cheddar naturally flavoured potato chips while watching a movie). In addition, they carry a nutrition claim (typically, nutrition claims stress either the presence or the increased amount of nutrients perceived as beneficial for health (e.g., antioxidants, vitamins) or the absence or the decreased amount of attributes regarded as harmful to health (e.g., sugar, fat) [3]), suggesting that the food is healthy and thus, “better” compared to its conventional version. Prior research indicates that although consumers acknowledge food with nutrition claims as healthier options [4–6], the purchase intention is low due to consumers’ anticipation of negative hedonic benefits from the product [7]. This occurs

especially for food with reduced sugar, fat, and salt contents, which affect the sensory properties of the product [8]. This occurrence is a negative halo effect [8,9] suggesting a health-pleasure trade-off.

In their attempts to combine healthy eating with the pleasure of indulgence, consumers increasingly seek products that offer both hedonic and utilitarian benefits. They usually associate hedonic food, such as snacks, with emotions of fun and pleasure [10], and utilitarian foods, such as fruits and vegetables, with performance benefits (e.g., provide energy) to eat and satisfy hunger [1,11]. However, food choice is a complex behavioural process that depends on multiple interdependent variables (e.g., motivation, which is not the focus of this research) that can be grouped under the goals and emotions/feelings of the person who makes the choice, and the characteristics (named as cues onwards) of the product itself [12,13]. From a theoretical perspective, understanding how consumers differ in their ability to pursue both utilitarian and hedonic goals is important.

Goal theories assume that goals are organised within a hierarchical structure [14]. Higher-order goals (e.g., living a healthy life) are associated with a superordinate level and are broken down into subgoals (e.g., consuming low-fat yoghurt). Short-term versus long-term goals are associated with the prolongation or not of the final goal achievement (i.e., instant gratification versus delayed consequences) as in the case of consuming an indulgent versus a healthy food [15]. Barsalou (1991) [16] illustrates that goals influence products' cognitive representations in line with "goal-derived categories" that represent the extent to which a common goal defines an established food category. For example, consumers often consider fruits and vegetables essentially nutritious and therefore characterise them as beneficial due to their aim in achieving the higher-order goal of living a healthy life. Conversely, consumers tend to categorise indulgent foods (e.g., ice cream) as vices because they serve instant gratification, which will delay the achievement of the higher-order goal of staying healthy. Combining the consumption of vice food products with nutrition claims may result in a goal conflict due to a contradiction between the indulgent and the healthy attribute attached to the food package [17,18]. To complicate things even further, emotions are a consequence of us attaining or not a goal, which, depending on the active/salient goal triggered in a specific consumption context and the product and its attributes, will affect purchase decisions. In other words, hedonic and utilitarian foods likely activate different goals (e.g., indulgent versus health) and then different emotions (e.g., positive versus negative) depending on the goal we had in mind. Emotions then motivate action (e.g., purchase) to realise the salient goal structure.

It is well-documented that consumers' emotional reactions differ as a function of their consumption experiences [19]. In decision-making contexts, people often anticipate how they will feel about future outcomes and use those feelings to guide their decisions [20]. Anticipated or associated emotions (named onwards) refer to the prospect of feeling positive or negative emotions after performing or not performing a behaviour (e.g., visualising the extrinsic attributes of a product or choice) [21]. Associated emotions differ from experienced emotions in their influence on people's behaviours in decision-making contexts, although experienced emotions partially influence anticipated emotional states [22]. Experienced emotions are immediate affective responses that arise almost instantaneously when people are in a decision-making context [23]. Although these emotions wear off fast, when they are intense, they tend to influence impulse behaviours (e.g., impulse buying) [22]. On the other hand, associated emotions are more conscious affective responses where people think about future emotional consequences based on whether or not a particular behaviour is enacted [23]. Associated emotions provide feedback on prospective behaviours and guide subsequent behaviours by commanding attention and stimulating analysis, learning, and adapting to behavioural outcomes [21–24]. Associated emotions last longer and help people to make better decisions [22]. Previous research suggests that associated emotions make an independent contribution to the prediction of behavioural intentions since people alter their behaviours based on feedback from associated emotions to obtain the preferred feedback [21,24].

Consumers' healthy food consumption behaviours are closely related to the pursuit of long-term benefits as a return on consumers' decisions. Hence, consumers' behaviours are influenced more by conscious emotional responses, such as associated emotions, than immediate affective responses [25]. Associated emotions can stimulate cognitive processing (e.g., health-related information) and encourage cautious choices (e.g., eating healthy foods). Previous research has identified that associated emotions are stronger predictors of behaviours compared to experienced emotions [26] and promote safer choices as well [27].

Within associated emotions, positive and negative are considered important emotions in healthy food consumption contexts since consumers generally have two conflicting food consumption values: the utilitarian value of staying healthy and the hedonic value of enjoyment [28–30]. Negative emotions arise during an unpleasant emotional state. For example, feelings of guilt and/or worry stem from the belief that one thinks that he/she is doing something wrong or undesirable [28]. Hence, these feelings result from an individual's knowledge that he/she is acting against their own moral or ethical standards [31]. When consumers feel negative emotions about a food product, this experience is perceived in the individual's memory along with other cues (e.g., current emotions, personal interest in health concerns, or type of food) and influences their actions in similar situations. These associated negative emotions (e.g., guilt, worry, dissatisfaction, boredom) may steer a person away from certain behaviours, such as eating indulgent or junk food [23]. Conversely, positive emotions (e.g., pleasure, joy, desire, satisfaction) are part of a pleased, happy, and delighted emotional state. In a food consumption context, these emotions can stem from the oro-sensory stimulation of eating food (e.g., taste or palatability), satisfying one's hunger [32], or achieving one's diet goals, especially in a health priming consumption context [30]. Although the role of emotion in consumer behaviour and marketing is well-documented (see [19,33] for an overview), there is limited research that combines emotions with the stated preferences (e.g., discrete choice experiments). To the best of our knowledge, there is scant literature that examines the relationship that goals (set up by a specific context) and associated emotions have in food choice behaviour.

The present study tries to fill this gap in the literature. The main objective of this research is twofold: (1) it examines the associated emotions of an individual transmitted from a product's extrinsic attributes (nutrition claims and sensory features in labelling) given a consumption goal activation (health versus indulgent) at the time of the survey; (2) it explores the relationship between the associated emotions (e.g., positive (proud, joy, desire, satisfied) or negative (worried, dissatisfied, disgust, bored)) attached to the extrinsic attributes and the actual choices.

This study contributes to the literature that explores consumption contexts in indulgent versus healthy food and the influence of associated emotions on choice behaviour in several ways. First, there is scant literature that examines the relationship that goals (set up by a specific context) and emotions have in food choice behaviour. These are important aspects to be examined together, as their combination allows consumers to evaluate indulgent versus healthy food as in a real purchasing situation. Second, there is an extensive amount of literature that explores emotional impacts, profiling emotions of unhealthy snacks that are energy-dense in sugar and fat, which evoke more intense (positive and negative) emotions [34]. However, there is limited research that examines how healthy products, such as dairy products, which evoke fewer emotions [35,36], affect consumers' emotions and their final choices. Obtaining more insight into this issue would be of major importance in designing optimal marketing strategies for healthy food.

Conceptual Framework and Hypotheses

Research on consumer decision-making deals with processes that determine product choice in a situation that mimics a real-life purchase, where multiple options are available, and explores how choice is affected by the attributes/information of the choice alternatives [37,38]. The conceptual framework in Figure 1 is developed considering this stream

of research and is considered a basic structure of the classical step model of consumer decision-making (e.g., [39]).

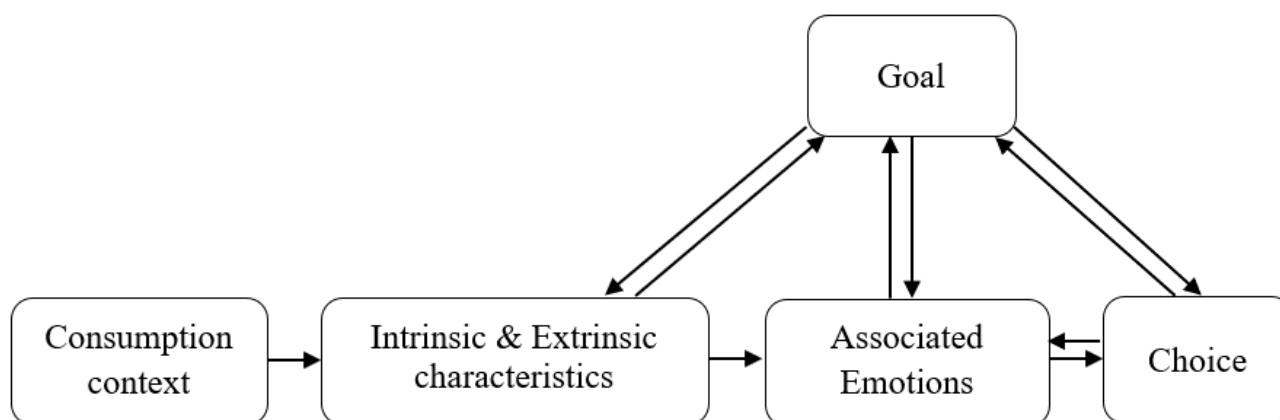


Figure 1. A conceptual framework illustrating the mediation process.

Much of consumer behaviour is goal-directed [33]. This can be found in the marketing of services (e.g., joining a health club to keep body weight under control) or food products, as in this case, to search for, choose, and purchase healthy food for a long-lasting healthy life. Consumption goals are not limited to end states but encompass experience sequences of interconnected happenings and ongoing processes (see [33] for more details on the role of goals in consumer behaviour), which here we refer to as consumption contexts. Previous research has suggested that consumption contexts strongly affect food intake and food choices [40,41]. Some of the actions of these consumption contexts might be congruent with our goals (e.g., switching high caloric snacks for fruits and vegetables to achieve our long-lasting healthy life goal). However, other actions might conflict with our goals (e.g., choosing a double chocolate chunk cake instead of fruits as dessert).

Part of choosing the most appropriate product for a specific consumption context and reaching a specific goal relies on the products' quality cues, which can be differentiated into extrinsic (e.g., price, claims, and labels) and intrinsic (e.g., taste or flavours) cues [42,43]. These quality cues combined with the desired specific outcome (e.g., purchasing the chocolate cake instead of fruits because my friends and I will enjoy it more on this occasion) enter the mind of the decision-maker and generate associated emotions, which in the case of positive emotions will more likely lead to the food purchase and vice versa. This process is based on the conceptual framework summarised in Figure 1. The consumer behaviour in this conceptual framework might be clear when the contrast between healthy products (e.g., fruits) versus unhealthy indulgent ones (e.g., chocolate cake) is obvious. However, it is not clear how the consumption context (health versus indulgent) and the relationship with the associated emotions (e.g., positive versus negative) attached to the product or the cues affect the actual choices of healthy food such as yoghurt with indulgent attributes and nutrition claims.

Following this conceptual framework and the results from previous research we predict three specific hypotheses.

Regarding the associated emotions, previous research suggests that consumers reveal mostly positive (e.g., pleasure, desire, joy, satisfaction) rather than negative (e.g., guilt, worry, boredom, dissatisfaction) associated emotions in response to food products [44,45], and these associated emotions for foods depend on consumers' goals [17,18]. More precisely, the study of Kim et al. (2013) [46] in a healthy food consumption context found that the perceived healthiness of a restaurant's food menu (e.g., nutritionally balanced diet, low in calories, fresh, organic, and healthy cooking methods) increased consumers' pleasure regarding the visit, although they perceived the healthy food as less tasty compared to conventional food. When people are asked to think about associated positive emotions (pleasure), this compromise would be strengthened since associated emotions stimulate

cognitive processing, which leads to more advisable outcomes or behaviours (e.g., health benefits). Thus, in a healthy food consumption context, associated positive emotions from health benefits are more important than taste. These associated emotions may influence which actions to take [23,30], resulting in positive behavioural intentions (e.g., purchase intentions or choice).

When consumers view healthy food alternatives, a cognitive process based on intrinsic (e.g., goals) and extrinsic (e.g., nutritional claims) cues generates consumers' perceptions of the healthiness of the food items. In a healthy food consumption context, the cognitive response of perceived healthiness influences the affective response of associated emotions and the goal congruence of staying healthy [25]. Consumers may infer associated emotional outcomes from their evaluation of the healthiness of the food and the consequences of consuming it (i.e., whether it is in congruence with their long-term goal of staying healthy or not). When consumers who want to stay healthy positively evaluate the healthiness of promoted healthy food extrinsic cues, associated positive emotions increase [25]. In other words, increased healthiness may engender feelings that an individual is in the "right" direction for achieving a long-term goal (e.g., staying healthy). Likewise, if consumers perceive that the extrinsic information of a food product is healthier, the associated positive emotions increase. A positive evaluation of food health makes people feel like they are doing the right thing [25]. Based on these notions, the present study hypothesises an increase in positive rather than negative associated emotions when the product version matches an individual's consumption context (health versus indulgent) (**H1**). In other words, participants in the "health" consumption context are expected to experience more positive than negative associated emotions when choosing the healthier version of the products than the less healthy, and vice versa for choices in the "indulgent" consumption context.

Regarding consumer choices, when yoghurt per se is considered a healthy food [36,47] and aligns with a higher-order goal of living a healthy life, it is expected to generate more choices for the product version that matches with the individual's consumption context (i.e., health), and vice versa for the choices in the "indulgent" consumption context. In other words, we expect consumers in the "health" consumption context to more often choose the healthier versions of the product than the less healthy versions, and vice versa for choices in the "indulgent" consumption context. Overall, we expect participants to choose the version of the product that matches the consumption context (i.e., goal activation) to which they belong (**H2**).

Lastly, Bublitz et al. (2010) [47] in their study found that positive associated emotions are related to food product choices. Hence, we expect consumers who continuously choose the same type of product version to state more positive than negative associated emotions for their choice (**H3**).

2. Methods

To fulfil the main objective of the research, we designed a survey, which was divided into three parts and included: (i) a discrete choice experiment, (ii) the food-associated emotion (PrEmo2 tool), and (iii) several questions related to consumers' sociodemographic characteristics.

The discrete choice experiment (DCE) was used to elicit consumer stated preferences (i.e., choices in Figure 1) for alternative yoghurts. The DCE is based on the consumer theory of utility maximisation [48], where the total utility depends on the characteristics of the product. DCEs are one of the most popular stated-preference methods used in consumer behaviour to investigate individuals' preferences for a certain good or service because they evaluate different attributes and levels simultaneously. Moreover, this approach is similar to a real purchasing situation where consumers are asked to make trade-offs between products characterised by different attributes [49]. DCEs provide several hypothetical purchasing scenarios. In each scenario, participants are asked to make choices between alternatives that represent products with different attributes and levels with a no-buy option. The familiarity with the decision mechanism in a DCE is one of the main advantages of this approach. Lastly, the DCE has a strong foundation in the economic

theory of Lancaster's microeconomic approach [48] and the random utility theory (RUT) of McFadden (1973) [50], which both assume that individuals are rational and make choices to maximise their utility derived from the attributes that a good possesses, taking into account their budget constraint.

To capture consumers' food-associated emotions, we use the product emotion measurement instrument (PrEmo2) tool, which defines the feelings in a graphical picture (i.e., associated emotions in Figure 1). Measuring food-associated emotions is not an easy task as emotions depend on many psychological and cognitive elements that cannot capture the full range of relevant aspects by a single measure (see [51] for an overview). Verbal self-reporting surveys are the most common technique used to measure food-associated emotional responses, due to their easiness in terms of application, cost-effectiveness, and discriminative power [52]. However, they present several shortcomings, including (i) generally, emotions are difficult to verbalise [53]; (ii) the lexicon of emotions varies across cultures and languages, especially for foods [44]; and (iii) verbalising emotions might obstruct the food experience itself [51]. To overcome some of these barriers, we use the PrEmo2, which is a cross-cultural validated tool [54]. In addition, PrEmo2 has the advantage of being an easy tool to apply cross-culturally [54,55], which aligns with our case, as participants come from different countries and different cultures.

2.1. Participants

A total of 209 participants were recruited by the University of Wageningen from a managed panel of the Marketing and Consumer Behaviour research group to participate in the online survey (Qualtrics®, Provo, UT, USA). Participants were older than 18 years (mean = 28.7), with 66% females ($n = 137$) and 34% males ($n = 72$). It would have been more appropriate to have a sample balanced based on gender. However, having more females than males might be expected since it is demonstrated that women are more likely to participate in surveys than men [56]. All consumed yoghurts (see Table 1 for the sociodemographic details).

Table 1. Descriptive analysis of the sample and sociodemographic characteristics (%).

	Sample	Treatments		
		Health	Indulgent	Control
Number of participants	209	70	72	67
	Gender [$\chi^2 = 2.185, p\text{-value} = 0.335$]			
Male	34.5	34.3	40.3	28.4
Female	65.5	65.7	59.7	71.6
	Age (years) [$\chi^2 = 7.391, p\text{-value} = 0.286$]			
Age of responders: mean (SD)	28.7 (9.9)	27.4 (6.8)	30.5 (11.9)	28.2 (10.1)
18–25	44.5	44.3	38.9	50.8
25–30	28.7	35.7	25.0	25.4
30–40	18.7	15.7	25.0	14.9
>40	8.1	4.3	11.1	9.0
	Completed education level [$\chi^2 = 11.981, p\text{-value} = 0.286$]			
Less than high school degree	0.5	-	-	1.5
High school graduate	18.7	12.9	22.2	20.9
Associate degree (2 years)	1.4	1.4	1.4	1.5
Bachelor's degree	39.7	41.4	36.1	41.8
Master's degree	32.1	38.6	26.4	31.3
Doctoral degree	7.7	5.7	13.9	3.0
	Body Mass Index (BMI) [$\chi^2 = 319.540, p\text{-value} = 0.590$]			
Underweight	55.0	55.7	50.0	59.7
Normal weight	23.9	14.3	26.4	31.3
Overweight	6.2	10.0	8.3	-
Pre-obese	8.1	11.4	8.3	4.5
Obese	6.7	8.6	6.9	4.5

Note: SD refers to the standard deviation.

2.2. Stimuli

The experimental procedure was implemented on yoghurts, which is a product category that captures a high level of differentiation from less healthy and less tasty conventional options (e.g., full-fat plain) to healthier (e.g., low-fat or fat-free yoghurts with fruits), and tastier versions (e.g., salted caramel, chocolate, etc.). Because increased yoghurt consumption and production are attributed to the perceived health benefits and its consumer appeal [57], yoghurt was selected as the product of interest. To select the attributes and the levels, we conducted market research and created a database of yoghurts bearing nutrition claims related to the fat content and other information (sensory features, brands, prices, quantity content) (see the levels of nutritional claims and the sensory properties in Table A1 in Appendix A). The creation of the database considered four supermarkets in Wageningen (Aldi, Jumbo, Alber Heijn, and Spar) (these four food retailers have the highest market share in the Netherlands (66.3% of the market share in total) compared with the rest [58]), and included a total sample of 334 yoghurts. From this total, 180 yoghurts were full-fat, 44 were half-fat or semi-skimmed, 50 were low-fat, 57 were fat-free, 36 contained berries, and 9 contained chocolate. The preliminary results from this database suggested two attributes to be included in the choice design: “nutrition claims” related to the fat content (full-fat, low-fat (2%), and fat-free) and the “sensory features” of yoghurt (plain, with berries, with double chocolate chunk). The reference quantity was 500 g because it was the size with the greatest presence in the market. For each of the nutrition claims and the sensory features, two levels were considered: present or not present. The design of the two presented yoghurt packages followed Street and Burgess (2007) [59] (The Street and Burgess method constructs optimal choice experiment designs that are constructed to estimate the main effects and two-factor interaction effects. The first alternative (attribute levels are expressed as integer values) is derived from an orthogonal main effect design, and the j -th ($j = 2, 3, \dots$) alternative is created by adding special combinations of integer values (i.e., generators) to the first alternative. Refer to Street and Burgess (2007) [59] for more details.), using the full factorial design with 24 ($2^3 \times 3$) original combinations, resulting in a practical set of nine pairs, with a D-efficiency of 97.8%. The design was estimated in Ngen 1.2 ChoiceMetrics Ltd. (<http://www.choice-metrics.com>).

2.3. Procedure

After giving informed consent, participants were randomly assigned to one of the treatments ($n = 70$ for the “Health”; $n = 72$ for the “Indulgent”; and 67 for the “Control” treatment). The survey design was divided into three parts, which included: (i) a discrete choice experiment, (ii) the food-associated emotion (PrEmo2 tool), and (iii) several questions related to consumers’ sociodemographic characteristics. Before entering the online survey, participants were pre-screened for qualification. The screening question asked participants whether they consume yoghurts (yes/no). The participants who answered positively were then directed to one of the two consumption contexts (indulgent or health) or the control treatment (no consumption context). In the “health” consumption context, participants were asked to imagine they were in the supermarket to purchase yoghurt to consume as a healthy snack and to choose their most preferred alternative. In the “indulgent” consumption context, participants were asked to imagine they were in the supermarket to purchase yoghurt to consume as a dessert and to choose their most preferred alternative. The participants in the control group were asked to imagine they were in the supermarket to purchase yoghurt and to choose their most preferred alternative.

During the DCE, participants were asked to choose nine times between two different yoghurt products or a no-buy option (Figure 2). The no-buy option was added to increase the similarity with a real shopping experience. The nine choice tasks were randomly presented to the participants and avoided ordering effects.

Next, participants were presented with all yoghurts (presented sequentially in random order) and were asked the following question (an example from the health treatment): “Imagine you are searching for a yoghurt to consume as a healthy snack. How would you feel if

you were consuming this product as a healthy snack? Please select the feeling that applies". Then, they selected one emotion for each product from a list of eight emotions (four positive and four negative) using the PrEmo2 tool (as shown in Figure 3). (From a focus group with several consumers, it was observed that some people confused the pictorial emotions when presented without a description. For example, the pictorial emotion of "satisfied" was confused with someone who is "relaxed"; the pictorial emotion of "joy" was related with "happy" and the one of "bored" was related with "sleepy". Finally, instead of including all twelve emotions of PrEmo2, we excluded four terms (hope, fascination, shame, sadness) since they were not suitable to characterise the evoked emotions for yoghurts. Instead of "fear", we used "worried" as a more suitable term as suggested by the participants) They indicated whether it corresponds to their current experience using a five-point scale, from one "I do not feel this" to five "I do feel this strongly". Participants provided a rating for each emotion before moving to the next product [54].



Figure 2. Example of a choice task used in the DCE.



Figure 3. PrEmo2 emotions were used in the study.

The second part of this task used a manipulation check and measured consumers' perception of the appropriateness of consuming each of the yoghurts according to the context treatment that they were assigned. This manipulation check was used to measure whether the associated emotions reported matched with the rating of the appropriateness of consuming the food category in the specific consumption context. For this, participants answered "How appropriate would it be for you to eat this product as a healthy snack?" using a scale from 1 (not at all) to 9 (very).

Afterwards, they filled in several questions regarding sociodemographic characteristics such as participants' age, gender, weight and height, level of education, and nationality.

2.4. Data Analysis

2.4.1. Statistical Analysis of the Emotional Variables

Emotion variables were analysed using STATA 17 (StataCorp, College Station, TX, USA). Descriptive statistics were used to report percentages, means, and standard deviations of the associated emotions in each treatment (Table 2). Then, a dummy variable (1 = positive (desire, satisfied, proud, joy) and 0 = negative (disgust, dissatisfied, worried, bored)) was created to measure possible differences between treatments using the chi-square (χ^2) test (Table 3, Scheme 1) for the associated emotions. ANOVA was used to measure consumers' perception of appropriateness on a 9-pt scale (1 = "not at all"; 9 = "very appropriate") of consumption of each of the yoghurts.

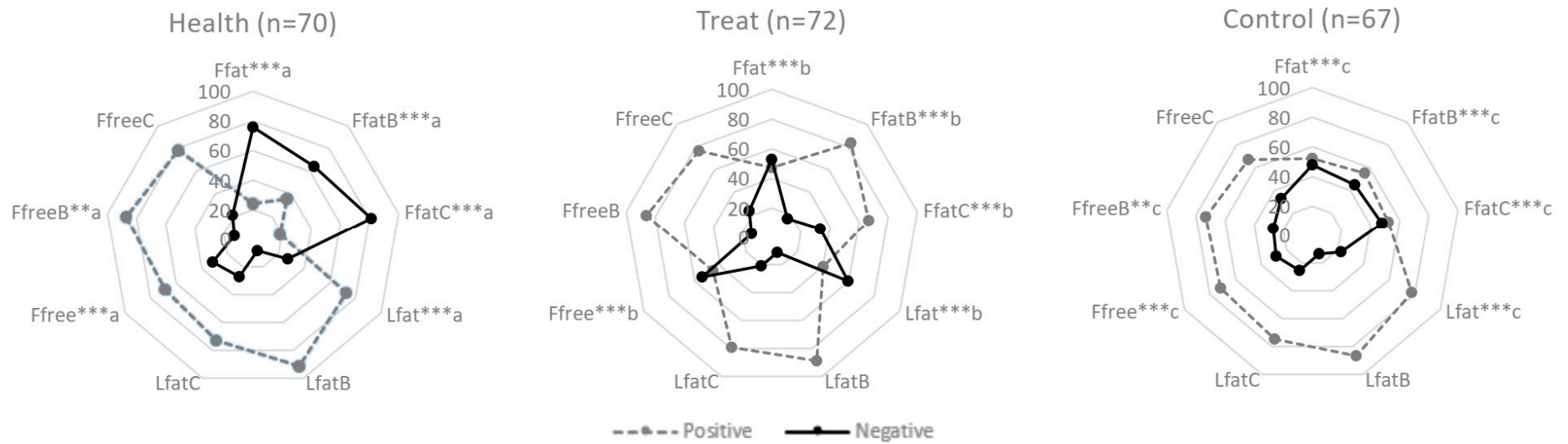
Table 2. Descriptive statistics on the associated emotions for each product and treatment (%).

Emotions		Treatment 1 (n = 70)—Health							
Products	Ffat	FfatB	FfatC	Lfat	LfatB	LfatC	Ffree	FfreeB	FfreeC
Desire	7.1	7.1	11.4	4.3	14.3	11.4	4.3	21.4	20.0
Satisfied	11.4	17.1	5.7	47.2	57.1	35.7	41.4	40.1	35.9
Proud	4.3	0	0	14.3	8.6	5.7	18.5	17.1	5.7
Joy	1.4	11.4	1.4	7.1	11.4	20.0	4.3	8.6	17.1
Disgust	11.4	4.3	8.6	2.9	1.4	4.3	10.0	1.4	0
Dissatisfied	27.2	18.6	21.4	7.1	1.4	2.9	8.6	5.7	10.0
Worried	24.3	38.7	45.8	0	2.9	12.9	0	1.4	8.6
Bored	12.9	2.9	5.7	17.1	2.9	7.1	12.9	4.3	2.7
Emotions		Treatment 2 (n = 72)—Indulgent							
Products	Ffat	FfatB	FfatC	Lfat	LfatB	LfatC	Ffree	FfreeB	FfreeC
Desire	5.6	23.6	26.4	1.4	12.5	11.1	2.8	12.5	12.5
Satisfied	32.0	41.7	23.6	29.1	50.0	41.7	29.2	44.4	29.2
Proud	1.4	2.8	0	5.6	8.3	2.8	8.3	11.1	6.9
Joy	8.3	15.3	16.7	4.2	18.0	23.5	5.6	18.0	27.7
Disgust	6.9	2.8	6.9	8.3	4.2	1.4	6.9	4.2	2.8
Dissatisfied	20.8	4.2	11.1	20.8	4.2	12.5	20.8	5.6	12.5
Worried	6.9	6.8	12.5	0	0	2.8	0	0	4.2
Bored	18.1	2.8	2.8	30.6	2.8	4.2	26.4	4.2	4.2
Emotions		Treatment 3 (n = 67)—Control							
Products	Ffat	FfatB	FfatC	Lfat	LfatB	LfatC	Ffree	FfreeB	FfreeC
Desire	10.5	11.9	19.4	6.0	7.5	20.9	3.0	17.9	11.9
Satisfied	31.3	32.8	17.9	47.8	52.2	31.3	49.3	31.3	31.3
Proud	0	0	0	10.5	4.5	0	11.9	7.5	6.0
Joy	10.5	10.4	14.9	13.4	22.4	22.4	7.5	16.4	17.9
Disgust	6.0	4.5	14.9	1.5	6.0	7.5	4.5	4.5	9.0
Dissatisfied	17.8	10.5	7.5	3.0	1.4	10.4	10.4	9.0	8.9
Worried	10.5	22.4	22.4	0	0	4.5	0	1.5	9.0
Bored	13.4	7.5	3.0	17.8	6.0	3.0	13.4	11.9	6.0

Table 3. Descriptive statistics of the positive versus negative emotions for each yoghurt alternative and treatment (%).

Emotions		Health (n = 70)							
Products	Ffat ^{a,b,c}	FfatB ^{a,b,c}	FfatC ^{a,b,c}	Lfat ^{a,b,c}	LfatB	LfatC	Ffree ^{a,c}	FfreeB ^{a,c}	FfreeC
Positive	24.3	35.7	18.6	72.9	91.4	72.9	68.6	87.1	78.6
Negative	75.7	64.3	81.4	27.1	8.6	27.1	31.4	12.9	21.4
^d Appropriateness—Mean (SD)	3.9 (2.1) ^{a,b}	4.0 (2.1) ^{a,b,c}	3.0 (1.9) ^{a,b,c}	6.9 (1.6) ^{a,b}	7.0 (1.7)	6.3 (2.0)	7.1 (2.0) ^{a,b,c}	7.3 (1.8)	6.6 (2.2)
Emotions		Treat (n = 72)							
Products	Ffat ^{a,b,c}	FfatB ^{a,b,c}	FfatC ^{a,b,c}	Lfat ^{a,b,c}	LfatB	LfatC	Ffree ^{a,c}	FfreeB ^{a,c}	FfreeC
Positive	47.2	83.3	66.7	40.3	88.9	79.2	45.8	86.1	76.4
Negative	52.8	16.7	33.3	59.7	11.1	20.8	54.2	13.9	23.6
^d Appropriateness—Mean (SD)	4.6 (3.3)	7.1 (1.9)	6.6 (2.4)	4.9 (2.5)	7.3 (1.7)	6.9 (1.8)	4.6 (2.5)	7.1 (1.7)	6.7 (2.0)
Emotions		Control (n = 67)							
Products	Ffat ^{a,b,c}	FfatB ^{a,b,c}	FfatC ^{a,b,c}	Lfat ^{a,b,c}	LfatB	LfatC	Ffree ^{a,c}	FfreeB ^{a,c}	FfreeC
Positive	52.2	55.2	52.2	77.6	86.6	74.6	71.6	73.1	67.2
Negative	47.8	44.8	47.8	22.4	13.4	25.4	28.4	26.9	32.8
^d Appropriateness—Mean (SD)	5.4 (2.3)	5.7 (2.2)	5.1 (2.7)	6.5 (2.7)	6.9 (1.5)	6.2 (2.3)	6.2 (2.3)	6.8 (1.9)	6.0 (2.5)
Emotion— $\chi^2(2)$	12.7 ***	33.5 ***	34.6 ***	25.0 ***	0.8	0.8	11.9 ***	5.7 **	2.6
Appropriateness—df (2), F (p-value)	8.5 ***	40.8 ***	42.0 ***	17.6 ***	1.0	2.2	21.0 ***	1.6	1.6

Note: ** and *** indicate statistical significance at 5% and 1% levels. SD is the standard deviation. ^{a,b,c} Different superscripts indicate statistically significant differences based on χ^2 with (2) degrees of freedom for associated emotions. ^d Measured with ANOVA on a 9-pt scale (1 = “not at all”; 9 = “very appropriate”).



Scheme 1. Positive versus negative associated emotions for each yoghurt alternative and treatment (%). Note: ** and *** indicate statistical significance at 5% and 1% levels. a, b, c: Different superscripts after the significance level of each variable name indicate statistically significant differences based on χ^2 with 2 degrees of freedom for associated emotions and 16 for the appropriateness.

2.4.2. Econometric Specification—Discrete Choice Experiment

The DCE method is consistent with the random utility theory and the Lancaster theory [48] of consumer demand. According to the random utility theory, the utility that individual n derives from product alternative j can be expressed as:

$$U_{njt} = V_{njt} + \varepsilon_{njt} = \beta_j X_{njt} + \varepsilon_{njt} \quad (1)$$

where U_{njt} is the n th consumer's utility of choosing product alternative j in choice task t , V_{njt} is the systematic representative proportion of the utility function that depends on X_{njt} and β_j , where X_{njt} is a vector of product attributes (e.g., nutrition claims (low-fat and fat-free) and sensory features (berries and chocolate)) and β_j are the coefficients to be estimated. The ε_{njt} is the idiosyncratic error and it is independently and identically distributed. To estimate consumer preferences for the multiple yoghurt attributes, we used a random parameter logit (RPL) model, which accounts for random taste variation. Given our DCE, the utility function that individual n derives from alternative j in choice task t is defined as follows:

$$U_{njt} = \text{No-buy} + \beta_1 L\text{Fat}_{njt} + \beta_2 F\text{Free}_{njt} + \beta_3 \text{Berries}_{njt} + \beta_4 \text{Choco}_{njt} + \varepsilon_{njt} \quad (2)$$

where n is the number of the respondent, j represents the available choices in the choice tasks (two experimentally designed yoghurt profiles and the no-buy option), and t is the number of choice task. *No-buy* is the alternative-specific constant representing the no-buy option. The variables related to the two nutrition claims (low-fat, *LFat*; fat-free, *FFree*) and two sensory features (*Berries* and *Choco*) enter the model as dummy variables, and "full-fat and plain yoghurt" represent the baseline. All estimations were conducted using NLogit 6.0 (Econometric Software, Inc.—New York, NY, USA and Waverton, Australia). Assuming homogeneous preferences, we first estimated a multinomial logit model. To allow heterogeneous preferences across individuals we estimated an RPL model, which considers that each individual chooses nine times [60]. For the model estimations, we used Halton draws rather than pseudo-random draws, because they provide more accurate simulations [60]. Comparing the results from these two models, the RPL model attained the best fit (available from the authors upon request) according to the log-likelihood and the pseudo-R. Hence, we discuss only the estimates of the RPL model below.

2.5. Relationship between Product Choices and Associated Emotions

To analyse the relationship between the yoghurt choices and the positive/negative associated emotions, we created a new variable that would measure the choices of individuals who continuously chose the same type of yoghurt (depending on the treatment) in the DCE and select a positive associated emotion. Then, we created another variable that identifies individuals who consistently choose the same yoghurt in all the choice tasks of the DCE and selects a negative associated emotion for their choice.

3. Results

3.1. Sample Characteristics

Table 1 presents the descriptive analysis of the sample for each treatment and the sociodemographic characteristics. The p -values of the chi-square tests indicate that the null hypothesis of equality between treatments cannot be rejected for all the characteristics: gender (0.335), age (0.286), education level (0.286), and body mass index (0.590), indicating that differences between treatments did not exist. The results imply that participants' randomisation was successful across treatments.

3.2. Consumption Context: Descriptive Analysis of the Associated Emotions

Table 2 shows the descriptive statistics of the associated emotions reported by the participants for each yoghurt and treatment. The participants in the "health" treatment felt mostly "satisfied" if consuming the low-fat (plain low-fat, low-fat with berries, and low-fat

with double chocolate chunk) and the fat-free (plain fat-free, fat-free with berries, and fat-free with double chocolate chunk) yoghurts and felt mostly “*dissatisfied*” and “*worried*” if consuming the full-fat alternatives (plain full-fat, full-fat with berries, and full-fat with double chocolate chunk) (variables with their abbreviations: “*Lfat*” plain low-fat, “*LfatB*” low-fat with berries, “*Lfat C*” low-fat with double chocolate chunk, “*Ffree*” plain fat-free, “*FfreeB*” fat-free with berries, “*FfreeC*” fat-free with double chocolate chunk, “*Ffat*” plain full-fat, “*FfatB*” full-fat with berries, “*FfatC*” full-fat with double chocolate chunk). In particular, 27.1% of them felt “*dissatisfied*” if consuming the full-fat plain yoghurt, while 38.6% felt “*worried*” if consuming the full-fat yoghurt with berries, and the full-fat yoghurt with double chocolate chunk (45.7%). Conversely, in the “*indulgent*” consumption context, most participants felt “*satisfied*” if consuming the full-fat yoghurt alternatives. Although individuals in this treatment felt “*satisfied*” if consuming the full-fat plain (32.0%) and the full-fat with berries (41.7%), and “*desire*” the full-fat yoghurt with double chocolate chunk (26.4%), the highest positive feelings were reported if consuming the low-fat yoghurt with berries than the full-fat or low-fat alternatives with double chocolate chunk. These results partially support H1.

Finally, in the “*control*” treatment, individuals felt “*satisfied*” if consuming all versions of yoghurts, except the full-fat yoghurt with double chocolate chunk (“*worried*”). In this treatment, most participants stated higher positive associated emotions if consuming the low-fat yoghurt alternatives (with berries (52.24%), plain (47.76%), and with double chocolate chunk (31.34%)) than the rest.

To provide further meaningful results regarding the participants’ associated emotions for each yoghurt alternative, we created a dummy variable for positive associated emotions (desire, satisfied, proud, joy), and another for negative associated emotions (disgust, dissatisfied, worried, bored). Table 3 reports the percentage of participants choosing positive versus negative associated emotions for each yoghurt alternative and the appropriateness of consuming the product in each treatment. Statistically significant differences for the associated emotions were assessed with the chi-square (χ^2) test and are also visually reported in Scheme 1.

Inequality of appropriateness ratings across the three treatments was tested with ANOVA. Findings showed that the low-fat yoghurt with berries received the highest percentage of positive associated emotion in all consumption contexts (“*health*” (91.4%), “*indulgent*” (88.9%), and “*control*” (86.6%)), and preferences were not statistically significant. Regarding the appropriateness of consuming the low-fat yoghurt with berries, participants in the “*control*” group selected it as the most appropriate for consumption (mean = 6.9, SD = 1.5) compared with the rest of the alternatives. Additionally, individuals from the other two treatments chose this yoghurt as the most appropriate to consume as a healthy snack (mean = 7.0, SD = 1.6), and surprisingly, in the “*indulgent*” treatment (mean = 7.3, SD = 1.7) as well. The second yoghurt alternative with the highest positive associated emotion in two consumption contexts (“*health*” (87.1%), and “*indulgent*” (86.1%)) with no statistically significant differences was the fat-free yoghurt with berries. While, in the “*control*” group, the second yoghurt alternative with the second-highest positive associated emotion was the low-fat plain yoghurt (77.6%). These results partially support H1 for the “*health*” treatment.

3.3. Estimates from the Random Parameter Logit Model

Table 4 reports the results from the RPL model. Three models were specified according to each treatment. As expected, the no-buy alternative was negative and statistically significant, indicating that the utility of participants increased by choosing one of the proposed yoghurt alternatives over the no-buy option.

Table 4. Estimation results of the RPL model and treatments.

	Control		Health		Indulgent	
Random Parameters in the Utility Function						
	Coefficient	T-ratio (z)	Coefficient	T-ratio (z)	Coefficient	T-ratio (z)
No-buy	−2.49 ***	−8.52	−0.68 **	−2.27	−1.32 ***	−5.03
Low-fat	0.77 ***	3.50	2.80 ***	8.86	0.43 *	1.83
Fat-free	0.67 **	2.50	3.73 ***	7.73	0.13	0.52
Berries	0.81 **	2.34	0.71 ***	2.62	2.42 ***	5.13
Choco	−0.71	−1.49	−0.01	−0.04	2.40 ***	4.33
Standard deviations of parameter distribution						
Low-fat	0.95 ***	2.64	0.58 **	2.30	0.91 ***	2.64
Fat-free	1.48 ***	4.66	2.04 ***	5.06	1.43 ***	4.34
Berries	2.13 ***	5.77	1.58 ***	5.01	3.13 ***	4.61
Choco	3.29 ***	6.52	2.18 ***	5.84	4.65 ***	6.00
N	1809		1890		1944	
Log-likelihood	−406.62		−351.23		−373.96	
χ^2	511.69		681.78		577.00	
Pseudo-R ²	0.39		0.49		0.44	

Note: *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

The coefficients of most attributes were positive and statistically significant (i.e., low-fat, fat-free, berries, chocolate), suggesting that the utility of the participants increased when these nutrition claims and sensory features (berries and double chocolate chunk) were included in the yoghurt package. The standard deviations for the four dummy variables (low-fat, fat-free, berries, and chocolate) were statistically significant, indicating unobserved heterogeneity in taste preferences across participants. Participants' utility under the "control" treatment increased when they chose yoghurts with berries rather than plain ones. Conversely, in this treatment, the participants were indifferent to yoghurts with double chocolate chunk. Regarding the nutrition claims, participants' utility increased when choosing low-fat then fat-free and full-fat yoghurts. Under the "health" consumption context, higher utilities were reported when choosing the fat-free and low-fat options compared with a full-fat alternative. Similarly, as in the "control" treatment, participants' utility increased when choosing yoghurt with berries rather than a plain one. Participants were indifferent to yoghurt with double chocolate chunk. Finally, in the "indulgence" consumption context, preferences changed as the consumer utility increased when choosing yoghurts with berries and double chocolate chunk over plain alternatives. Hence, consumers in this treatment chose mainly based on the sensory rather than the healthier aspects of the product. Participants were indifferent when choosing a fat-free alternative. These results support H2.

To provide information related to the relationship between the utility of consumers and the positive versus negative associated emotions, we created a dummy variable that links the choice for a specific variable (e.g., fat-free) from the DCE with the associated emotions of the same variable (i.e., fat-free). The first dummy variable (choices with positive emotions) identified individuals who continuously chose the same type of yoghurt in the DCE and selected a positive associated emotion for that same type of yoghurt. The second dummy variable (choices with negative emotions) identified individuals who consistently chose the same type of yoghurt in all the choice tasks of the DCE and selected a negative associated emotion for the same type of yoghurt. Table 5 reports the results in terms of the number of participants and proportions (%).

Findings from the "control" treatment suggested that most consumers (42%) chose the low-fat yoghurt with berries and reported positive associated emotions if consuming this yoghurt. On the contrary, 5% of the participants who chose the full-fat yoghurt with berries reported negative associated emotions if consuming this alternative. Most participants in the "health" consumption context (67%) chose to purchase the fat-free yoghurt with berries and reported positive associated emotions when consuming this alternative. Conversely, 9% of the participants who chose to purchase the fat-free plain alternative selected negative

associated emotions if consuming it. Finally, in the “*indulgence*” consumption context, most participants (46%) chose to purchase the low-fat yoghurt with berries and selected positive associated emotions if consuming this type of yoghurt. Contrariwise, the participants selected negative associated emotions when choosing the plain low-fat and the full-fat yoghurt with double chocolate chunk in the DCE. These results are consistent with the utilities and the choice of consumers (Table 4) and partially support H3 for the “*health*” but not the “*indulgence*” treatment.

Table 5. Estimation between yoghurt choices and associated emotions (positive versus negative).

Attributes	Control (<i>n</i> = 67)				Health (<i>n</i> = 70)				Treat (<i>n</i> = 72)			
	Choices with Positive Emotions		Choices with Negative Emotions		Choices with Positive Emotions		Choices with Negative Emotions		Choices with Positive Emotions		Choices with Negative Emotions	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Ffat	17	25.4	1	1.5	4	5.7	0	0.0	6	8.3	1	1.4
FfatB	20	29.9	3	4.5	10	14.3	1	1.4	31	43.1	1	1.4
FfatC	16	23.9	2	3.0	1	1.4	0	0.0	31	43.1	2	2.8
Lfat	21	31.3	0	0.00	15	21.4	5	7.1	10	13.9	2	2.8
LfatB	28	41.8	1	1.5	23	32.9	2	2.9	34	45.8	1	1.4
LfatC	21	31.3	0	0.0	21	30.0	2	2.9	28	38.9	0	0.0
Ffree	21	31.3	0	0.0	26	37.1	6	8.6	10	13.9	0	0.0
FfreeB	26	38.8	1	1.5	47	67.1	1	1.4	26	36.1	1	1.4
FfreeC	17	25.4	1	1.5	38	54.3	0	0.0	27	37.5	1	1.4

Note: *n* indicates the number of participants.

4. Discussion

In this paper, we examined the associated emotions of an individual, transmitted from the extrinsic attributes on food packages given a consumption context activation at the time of the survey, and studied the relationship between the associated emotions attached to extrinsic attributes and actual choices.

Reaching the desired goal activated by a consumption context (healthy food versus indulgent) affects our associated emotions. Our findings report stronger positive associated emotions when choosing a healthy product when the goal activated by the consumption context is to stay healthy. This is partially in line with H1 and the previous findings of Macht et al. (2003) [61], who show that the intensity of negative associated emotions of consumers increases with the increase of the energy density of the food due to weight control and health concerns. The result is consistent with the recent dairy consumption trend of demanding yoghurts with little or no fat as unhealthy fats are prominent risk factors for diet-related diseases [62–64]. Reporting stronger positive associated emotions for healthy products even when consumed as an indulgent product is consistent with the results of Fu et al. (2018) [65], who relate consumers’ experiences and/or the associated consequences of linking dairy fat with several diseases (e.g., heart disease). The relationship between positive associated emotions and healthy food is consistent, with one previous retrospective study stating that the consumption of more “healthy” food and less “junk” food is linked with positive emotions [66]. Additionally, reporting stronger positive emotions for healthy instead of unhealthy food even when they are tasty is consistent with the results of Macdiarmid and Hetherington (1995) [67], who reported lower positive and higher negative associated emotions before eating chocolate.

Regarding consumer choices from the DCE, we accept H2 and find higher choices when the product version matches with the individual’s consumption context. As expected, consumers’ utility in a “*health*” consumption context increases when choosing healthier product alternatives rather than less healthy ones. Conversely, consumers’ utility in a “*treat*” consumption context increases when choosing mainly based on the sensory rather than the

healthier aspects of the product. Finally, in terms of whether there is a relationship between the associated positive emotions and the actual choices in each consumption context, we accept **H3**. Participants who chose the same product category in all choice tasks selected mostly positive rather than negative associated emotions for their choice. This result is consistent with the findings of Bublitz et al. (2010) [47], who demonstrate that positive emotions are linked with food choices.

Given that associated emotions are rarely examined in the context of healthy foods, more research is needed to replicate the current findings. Methodologically, this study is the first to combine a DCE with the PrEmo2 tool to investigate different consumption contexts at the time of the survey and study the relationship between the associated emotions attached to extrinsic attributes and the actual choices. The combination of these two methods provides new insights into the decision-making process and consumer behaviour, allowing researchers to choose an alternative way to examine consumption context and associated emotions when investigating food choices. Future research might examine whether emotions are also related to healthy food choices in other food categories. Helping consumers to be more mindful of their emotions may promote overall greater nutritional status. A meta-analysis examining the effects of positive and negative emotions on food choices and eating behaviours suggested that negative emotions were associated with greater food intake, while positive emotions were linked to higher caloric intake [68]. Thus, future research should continue to assess more specific food choices as well as how positive and negative associated emotions affect the quantity and the calorie content of the food consumed. In addition, in the present study, the associated emotions of the product were based on the extrinsic product properties. Still, it has been shown that choice behaviour and emotional responses to food products are also influenced by intrinsic properties (e.g., the taste of the product) [44,69]. Hence, future studies should consider the full product experience and include intrinsic and extrinsic attributes. Further, this study examined the differences between consumption contexts using a between-subject design as applied in several studies [36,40,70,71]. However, future research could work with within-subject designs to avoid potential inter-panel differences when examining context effects. Mood can alter food choices, and food choices can alter mood, for various reasons [72]. Therefore, future research should try to characterise the predictive traits using psychological mechanisms to examine the link between food choices and moods. This may allow producers, processors, and retailers to develop food strategies tailored to personal emotional needs. This research uses self-reported data, which may be biased as participants may report what they believe to be the socially desirable answer [73]. To overcome this possible limitation, future research may use implicit methods to measure emotions (e.g., heart rate, brain activity, facial expressions, etc.), as they are indirect and non-self-reported measurements and are not under the conscious control of the consumer [74,75]. The technological advances also give possibilities to break down the walls between hypothetical methods (DCE) and more realistic settings [69,76]. The use of immersive settings but also new material such as 3-D glasses raise possibilities for interesting future research [77,78].

5. Conclusions

This research examined the associated emotions of an individual transmitted from the extrinsic attributes on food packages given a consumption context activation at the time of the survey, and studied the relationship between the associated emotions attached to extrinsic attributes and actual choices. Empirically, the results suggest the degree to which consumers' associated emotions vary in the presence of different consumption contexts, and the presence/absence of product quality attributes in choice behaviour. Associated emotional ratings along with yoghurt choices revealed significant differences between the emotional profile of positive associated emotions for choosing healthy versions of foods and negative associated emotions for choosing less healthy options. Choosing mainly healthy foods not only under a "health" but also under an "indulgent" consumption context shows that the importance of the sensory attribute is slowly being replaced by

health concerns even on healthy food alternatives. This is an important statement, which should be tested by future studies. Methodologically, the consideration of consumption context in DCEs affected consumers' utility as well as identified a relationship between the positive associated emotions and the final choices. These results suggest that associated consumption contexts might offer an interesting methodological alternative to increase the predictive ability in choice experiments, contributing to the development of more effective marketing strategies.

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Abbreviations

NC, nutrition claim; DCE, discrete choice experiment; PrEmo, Product Emotion Measurement Instrument; RUM, random utility theory; RPL, random parameter logit model.

Appendix A

Table A1. Levels of nutritional claims, the sensory features, and the variable names used.

No.	NC Levels	Sensory Properties
1	Full-fat	Plain
2	Low-fat	With berries
3	Fat-free	With double chocolate chunk

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