How do emotions influence healthy food choice? Investigating an extended framework of the social-cognitive theory

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Abstract

Purpose – The purpose of this study was to investigate how and through which social-cognitive constructs, emotions influence healthy food shopping behaviors. Direct effects of those constructs, as well as indirect effects of consumer emotions are considered.

Design/methodology/approach – An altered version of the Social Cognitive Theory, including intention, socio-structural factors, outcome expectancies and self-efficacy with the addition of consumer emotions was analyzed using structural equation modeling. Data of 1,181 volunteers were collected in Germany in 2021 through an online survey.

Findings – Intention was the most important positive predictor of food choice, while socio-structural factors had the biggest impact on intentions. Those were mostly influenced by self-efficacy, which was strongly predicted by consumer emotions. Outcome expectancies did not influence the current model in any way. Consumer emotions did not directly influence intention, nor actual choice, however showed to be influencing those variables through indirect effects.

Practical implications – Marketers could benefit from these results by incorporating the current findings into existing marketing strategies through targeting a combination of social cognitive constructs, as well as consumer emotions to facilitate healthier food shopping behavior.

Originality/value – Affect has received increasing attention in regards to its impact on healthy eating behaviors in recent years. Less attention has been paid to the mechanisms through which emotions influence healthy nutrition behavior, specifically how consumer emotions influence healthy food shopping behavior.

Keywords Food choice, Social cognitive theory, Consumer emotions, Structural equation modeling, *Enable*-cluster

Paper type Research paper

Introduction

Increasing levels of overweight and obesity are a major health challenge worldwide (World Health Organization, 2022). A possible intervention method is a change in nutrition behavior towards less energy intake, for instance through reducing fat consumption (Wirth *et al.*, 2014). In Germany, fat intake has been found to be above the recommended amount for all tested age groups of 14–80 years old with dairy being the main source of fat-intake for men and the second biggest for women (Max-Rubner-Institut, 2008).

Therefore, the current study aims to understand healthy decision-making for yogurt products from a consumer's perspective. Fat-reduced yogurts show a lower average sugar content than full fat yogurts, indicating additional health benefits (Moore *et al.*, 2018). A study ran by the authors found that consumers are mostly concerned with fat content when it comes to yogurt nutrients, as compared to sugar content, protein content or others. Furthermore, previous research suggests that low-fat products are considered healthy by many consumers (e.g. Lusk, 2019). Thus, this study aims to grasp not necessarily the healthiest yogurt choice overall from a nutritional perspective, but is focusing on which factors contribute to consumers choosing the option they are likely to *perceive* as healthy.

Emotions are suggested to be connected to higher consumer fat intake (Weltens *et al.*, 2014). Anton and Miller (2005), found that negative emotions, namely levels of depression and trait anger, are associated with higher fat-intake. Similarly, Aguiar-Bloemer *et al.* (2021) found that, participants showed increased fat-intake after negative emotion induction, as compared to a neutral emotional state. In fact, the relationship between emotions and eating has been well-studied (e.g. Meule *et al.*, 2021; Nicholls *et al.*, 2016; Evers *et al.*, 2013).

Research investigating decision-making in a food shopping context found that food products are more likely to be chosen if they *elicit* positive emotions. Gutjar *et al.* (2015) suggest that higher valence in combination with higher liking substantially contribute to food product choice. Ballco *et al.* (2022) found that consumers associated more positive emotions with choosing the healthier yogurt option over the unhealthier one, resulting in higher liking scores for this product. Less research has investigated how consumer emotions experienced *independently* of the product influence food decision-making in a shopping context. However, this is important to explore, as food choices in a supermarket are suggested to largely shape a household's diet (Eyles *et al.*, 2010).

As mentioned by Williams *et al.* (2019), the influence of affect on health behaviors has gained more attention in recent years. Following their suggestion, the current study aims to find out how affect interacts with traditional social-cognitive constructs of health behavior models; specifically, how social-cognitive constructs in combination with an extended element of "emotions" can predict consumers' healthy food choice and intention to buy low-fat products. The Social Cognitive Theory (SCT) by Bandura (1986) has been used to explain healthy eating behavior in the past (Rolling and Hong, 2016; Sebastian *et al.*, 2021) and is suggested to be a useful baseline for predicting nutrition behavior in a shopping situation (Anderson *et al.*, 2001).

The current study enhances existing research by examining if SCT constructs can predict low-fat product choices in shopping contexts, assessing the role of emotions in food decision-making and exploring the mechanisms through which emotions influence consumer food choices. The findings could inform marketing strategies for healthy food products and support governmental efforts to promote healthier eating behaviors.

Theoretical framework and hypotheses
Intention
In his research, Bandura (2004) states the importance of goals as a primary source to drive behavior (change). As Berkman (2018) describes, proximal goals appear more valuable for the decision-maker, thus having a stronger influence on the behavior. Therefore, proximal goals, also referred to as intentions were chosen for the current model. Specifically, intention to buy a healthy food product was investigated. In line with previous findings, that goal setting influences healthier dietary behavior (e.g. Schnoll and Zimmerman, 2001; Miller and Cassady, 2012), the following hypothesis has been formed for the current model:

H1. Intention has a direct positive effect on healthy food choice.

Socio-structural factors

In his model, Bandura (2004) recognizes that socio-structural factors serving as impediments and facilitators are crucial aspects of influencing intentions. As a facilitator to identify healthy products, many countries around the world have introduced front of package labels, such as the Nutri-Score or the Multiple-Traffic-Light label (Beckh *et al.*, 2020). Label usage is associated with being able to recognize healthier food products (Packer *et al.*, 2021) and has been found to be a relevant component of facilitating healthier food decision-making while food shopping (Egnell *et al.*, 2020). Specifically, front-of-package labels have been found to increase intention to purchase healthier products (Temple, 2020). Since labels are a part of the environment of the decision-maker in a food shop, label usage was included as a socio-structural variable. Besides that, there is a strong interest towards introducing a mandatory front-of-package health label within the EU in order to encourage healthier food choices (Hercberg *et al.*, 2022). Label use therefore appears to be an important factor to investigate in the light of recent developments in the food and retail sector. Another important factor to consider is the social environment of an individual. Van Duyn *et al.* (2001), found that social support is an important component of behavior change towards healthier eating practices, while Robinson *et al.* (2013) claim that social factors are crucial predictors of nutrition behaviors. Furthermore, Elmacıoğlu *et al.* (2021) suggest that changes in social interactions due to the COVID-19 pandemic (i.e. social isolation), caused changes in nutrition behaviors. Based on these findings, the following hypotheses were formulated:

H2a. Label use has a positive effect on intention.

H2b. The social environment has a positive effect on intention.

Outcome expectancies

Outcome expectancies (OE) refer to one's beliefs about the possible consequences of a certain behavior (Bandura, 2004). Those can be positive or negative and refer to different dimensions (Luszczynska and Schwarzer, 2015). Previous literature found a link between OE and nutrition behavior (e.g. Schwarzer *et al.*, 2018) and according to Bandura (2004) OE can influence behavior directly. Furthermore, it is an important aspect of goal formation, as OE are believed to be the key driver for the decision to set the initial goal to perform or change a certain behavior by weighing the positive and negative OE (Luszczynska and Schwarzer, 2020). Therefore, the following is predicted for the current model:

H3a. OE have a direct positive impact on healthy food choice.

H3b. OE have a positive impact on intention.

Self-efficacy

Bandura (1977) believes, that the higher an individual's perceived self-efficacy (SE), the more persistently they will engage in a behavior. Previous studies found that high levels of SE can result in greater behavior change (Witte and Allen, 2000). SE has been reported to be linked to healthier food choices, for instance regarding more fruit and vegetable and less fast food intake (Smith *et al.*, 2020), as well as less snacking (Churchill *et al.*, 2019). SE is described to be domain-specific (Bandura, 2006) and concerning health behaviors, health SE is suggested to be a predictor of behavior change in previous research (e.g. Choi, 2020; Lee *et al.*, 2008). In line with Bandura's (1978) proposal that SE influences every social-cognitive construct of behavior change, the current model suggests the following hypotheses:

H4a. Health SE has a direct positive impact on healthy food choice.

H4b. Health SE has a positive impact on intention.

H4c. Health SE has a positive impact on OE.

H4d. Health SE has a positive impact on the social environment.

H4e. Health SE has a positive impact on label use.

Consumer emotions
In the context of decision-making, Lerner *et al.* (2015) describe emotions to be a crucial part of choosing a certain product. In their emotion-imbued choice model, current emotions influence various aspects of decision-making, such as expected outcomes (including expected emotions), characteristics of the decision-maker, as well as conscious and nonconscious evaluations of the product. To capture consumer emotions, Pfister and Böhm (2008) proposed a multifaceted framework of emotions. They focus on four functions of emotions involved in the decision-making process: the information function, the speed function, the relevance function, and the commitment function. Furthermore, in the context of consumer behavior, the Consumer Emotion Set (CES) by Richins (1997) proposes emotions that are likely to be experienced by consumers. By combining these works, distinct emotions that are involved in consumers' decision-making can be formed. The current model considers those as an additional factor to influence food shopping behavior in different ways. First, emotions are expected to influence SE. Levels of SE are informed by different channels, one of them being affect (Bandura, 1997). More positive emotions about a task, may result in an increase of their estimated ability to perform it. Similarly, emotions can also impact OE (Klusmann *et al.*, 2016). Furthermore, previous studies have found an effect of emotions on food choice (e.g. Gutjar *et al.*, 2015). Specifically, a connection between positive emotions and healthier choices has been found (Brückner *et al.*, 2023). Therefore, the current model considers consumer emotions a crucial aspect of food choice, as well as intention to buy a healthier product. This is also considered to be apparent through indirect effects. As a result, the following hypotheses emerged:

H5a. Consumer emotions have a direct positive effect on healthy food choice.

H5b. Consumer emotions have a positive effect on intention.

H5c. Consumer emotions have a positive effect on SE.

H5d. Consumer emotions have a positive effect on OE.

H5e. There is an indirect effect of consumer emotions on healthy food choice.

Materials and methods
Data collection and sample
A standardized online questionnaire featuring a Choice-based Conjoint (CBC) experiment was conducted using Sawtooth Software Version 9.15. The CBC focused on five yogurt attributes: nutrients (fat and protein content), price, flavor, Nutri-Score and production method. The nutrient attribute had six levels, including two low-fat and varying protein content options, along with two medium and two high-fat options with different protein levels. The focus on fat and protein contents was applied, considering the increase in sales of high protein yogurts connected to health benefits (Jørgensen *et al.*, 2019; Brechelmacher, 2022), as well as the perception that low-fat (yogurt) products are healthy (Lusk, 2019; Pinto *et al.*, 2021). Using a claim like "low-fat" as a heuristic to judge a product as healthier can additionally lead to a "spillover" effect, where consumers assume that a product also has other favorable health properties, such as less calories (Wang and Begho, 2024) or lower sugar contents (Jahn *et al.*, 2023). Furthermore, while fat content seems to be extremely important to yogurt consumers

(Bruhn *et al.*, 1992), little acceptance has been previously found for reduced sugar levels (Chollet *et al.*, 2013). In the current experiment, participants chose from three yogurt options plus a "none" option across eight choice tasks, using a balanced overlap method. The analysis showed that nutrients were the most critical attribute, with an average importance of 27.23% (SD = 11.91), and medium-fat options were preferred (see Table A1 in the supplementary materials). The full procedure of the CBC experiment, all attributes as well as their levels, mean importances and average utilities are described elsewhere in detail in Brückner *et al.* (2023).

The questionnaire was distributed in December 2021 through a market research institute and pretested with 150 participants, targeting those over 18 (partially) responsible for their household shopping and who had bought dairy products in the last year. Participation was voluntary with informed consent, adhering to strict data protection and ethical standards (i.e. principles of the Helsinki Declaration and the German Research Foundation (DFG)). Participants were recruited via quota sampling to ensure a reflection of the target population in Germany in terms of age, gender, size of the place of residence, as well as federal state (Axel Springer SE, 2021). This resulted in 3,455 initial participants. After eliminating incomplete answers and the data of persons who repetitively provided the same answer to more than half the questions and of participants who were double as fast or slow as the median, the final sample consisted of 1,181 persons analyzed in this study. Table 1 summarizes the sample characteristics. 382 participants reported to regularly purchase fat-reduced yogurts, while 800 participants claimed not to do so. Since the original questionnaire did not include a global item for emotions, an additional questionnaire was distributed between April and June 2023 to assess the original emotion variables, as well as an extra global item to calculate construct validity of the scale. In this study, 154 volunteers took part, 68 of which identified as male, 85 as female and one as diverse.

Analysis
Structural equation modeling (SEM) was used to analyze the proposed model since it offers the opportunity to investigate multiple variables simultaneously by using a combination of multivariate analysis techniques (Hair *et al.*, 2017). In the current study, partial least squares (PLS) SEM was used. PLS-SEM is a suitable approach, as it allows the researcher to

Demographics	Frequency	% of the sample ($n = 1,181$)	% of the target group in Germany
Gender			
Male	486	41.1	41
Female	693	58.7	59
Diverse	2	0.2	
Age			
18–29	150	12.7	14
30–49	338	28.6	31
50–69	577	48.9	36
70+	116	9.8	19
Population of the place of residence			
<5,000	166	14.1	13
5,000–50000	479	40.6	44
50,000–500000	330	27.9	24
>500,000	206	17.4	17
Total	1,181	100	100
Source(s): Authors' work, Emberger-Klein *et al.* (2022) and Axel Springer SE (2021)			

Table 1.
Demographic characteristics of the sample

investigate a theory in development, such as the extension (emotions) of a given model (SCT) and thereby identifying the strongest predictors of an outcome variable (choice) (Hair *et al.*, 2019). The analysis was conducted using the SmartPLS 4 software (Ringle *et al.*, 2022), as well as Sawtooth Software Version 9.15 for the CBC results and the extraction of the utility values.

Conceptualization

The final model proposed in this study consisted of one dependent variable (choice), and six predictor variables: intention, OE, health SE, emotions, label use and social environment. The choice variable was represented by the sum of the individual zero-centered utility scores of the two fat-reduced options with either 0.3% or 1.7% fat/100 g derived from the CBC data, which were analyzed using Hierarchical Bayes estimation. Here, 10,000 iterations were run before the results were used. This resulted in a proxy choice variable for low-fat yogurt options for each participant, representing the participants' choosing of what they are likely to *perceive* as healthy options.

All predictor constructs, except for intention, utilized multiple-item scales, while intention was measured with a single-item scale (Petrescu, 2013) by inquiring about participants' plans to purchase fat-reduced yogurt in the next three months. All ratings were on a five-point scale from 1 (completely disagree/never) to 5 (completely agree/always). Emotions were measured using semantic differential scales from positive to negative extremes. Established scales were chosen based on previous health or consumer research. The OE scale, for instance, was specifically designed for nutrition- and health attitudes and outcome expectations (Diehl, 2002). The HSE scale was derived from health-related research (Lee *et al.*, 2008), where the importance of self-efficacy and emotions concerning communication strategies were investigated in a health setting. The social environment scale was derived from literature specifically examining brief psychological measures and their validity in a dietary setting with the chosen scale showing good validity with dietary intake (Norman *et al.*, 2010). The scale to assess label use was chosen due to its proven usefulness in consumer research regarding sustainable products (Rumm *et al.*, 2015). The scale was slightly adjusted in the current study to adequately represent the health aspect of nutrition labels. Finally, the emotion scale combined research on consumer emotion functions (Pfister and Böhm, 2008), as well as the consumer emotion set (Richins, 1997). An adjusted version of the chosen scale has been tested previously in the context of pro-social purchases (Berki-Kiss and Menrad, 2022) and was deemed adequate for investigating consumer emotions. Details of the scale items and their sources are provided in Table 2. Notably, the constructs health SE and OE were measured on a long-term scale, while social environment and intentions were measured on a shorter time scale (three months and one month) and actual choice was measured on a short-term scale (i.e. immediate choice). Emotions and label use were measured in a more general context without any specific time frame.

Results

Model assessment

The model assessment, the threshold values, as well as procedural information of this analysis followed the guidelines of Hair *et al.* (2017). To assess the model and to assure statistical significance, the bootstrapping method (with 5,000 subsamples) was used. Two items reflecting the OE latent variable (OUTCE1, OUTCE8), as well as one item reflecting the social environment variable (SOCE5) did not show sufficient outer loadings (<0.707), resulting in an adjustment of the model by means of excluding these items.

OE, social environment, label usage and health SE were measured on a reflective scale, as they represent consequences rather than causes of the construct (Rossiter, 2002) and are

Constructs/ Indicators	Statements to evaluate indicators (5-point likert scale)	Sources
Health self-efficacy		Lee *et al.* (2008)
HSE1	I am confident I can have a positive effect on my health	
HSE2	I have set some definite goals to improve my health	
HSE3	I have been able to meet the goals I set for myself to improve my health	
HSE4	I am actively working to improve my health	
HSE5	I feel that I am in control of how and what I learn about my health	
Label use		Adapted from Rumm *et al.* (2015)
LAB1	I know the different nutrition labels on food products well	
LAB2	I prefer products with nutrition labels to products without nutrition labels when food shopping	
LAB3	When food shopping, I consciously pay attention to whether products contain a nutrition label or not	
Social environment	How often in the last 30 days has your family or friends done the following?	Norman *et al.* (2010)
SOCE1	Encourage you to eat healthy foods	
SOCE2	Discuss the benefits of eating healthy foods	
SOCE3	Remind you to choose the healthy food option while food shopping	
SOCE4	Share ideas on healthy eating	
SOCE5	Eat healthy meals with you	
SOCE6	Complain about unhealthy foods	
Outcome expectancies		Diehl (2002)
OUTCE1	Nutrition research helps us to live longer	
OUTCE2	Only if I eat healthy, I am fit and fully efficient	
OUTCE3	The right kind of diet is an important prerequisite for a healthy and long life	
OUTCE4	True well-being can only be achieved by maintaining a healthy diet	
OUTCE5	A healthy diet also makes me feel better mentally	
OUTCE6	Many complaints of old age could be avoided if people ate healthier	
OUTCE7	A sensible diet has a beneficial effect on every person's health	
OUTCE8	It is certain that you live longer if you eat healthy	
Emotions		Based on Pfister and Böhm (2008) and Richins (1997)
EMO1 (information function)	When I buy healthy food products, I feel content/ discontent	
EMO2 (relevance function)	When I buy healthy food products, I feel fulfilled/ unfulfilled	
EMO3 (commitment function)	When I buy healthy food products, I feel proud/guilty	
EMO4 (speed function)	When I buy healthy food products, I feel calm/ overwhelmed	

Table 2.
Scale items, individual statements and sources

Source(s): Authors' work

mutually interchangeable (Jarvis *et al.*, 2003). The opposite was true for the variable "emotions" which was measured on a formative scale. Quality criteria for the reflective and formative measures of the model are portrayed in Table 3. Convergent validity was assessed via the average variance extracted (AVE). Both measures offer acceptable (rho A: >0.7 and < 0.95, AVE: >0.5) values for all constructs. Furthermore, all heterotrait-monotrait (HTMT) ratios were below the threshold of 0.85 (Henseler *et al.*, 2015), indicating sufficient discriminant validity.

All formative indicators had a Variance Inflation Factor (VIF) below 5, indicating no collinearity issues. Except for the EMO4 item (speed function), all indicators' outer weights were significant, marking them as relevant for the construct of emotions. While EMO4's weight was not significant, its loading was, albeit below 0.5. Thus, given the theoretical framework, EMO4 was retained in the model. Convergent validity, assessed through redundancy analysis, was 0.680, slightly below Hair *et al.*'s (2017) threshold of 0.707. However, following Cheah *et al.* (2018), this value was considered acceptable for the study's context.

The structural model was assessed, as described in Table 4. All VIF values in the current model suggest no collinearity issues by being below the threshold of 5. R^2 values suggest that low to moderate levels of variances in the constructs are explained (0.105–0.367). Finally, all Stone-Geisser cross-validated redundancy measure (Q^2) values were above zero, indicating satisfactory predictive relevance of the model.

Model	Construct	Indicator	Outer loading	Outer weight	rho A/ Outer VIF-values	AVE/ Convergent validity	Highest HTMT ratio
Reflective	Health SE	HSE1	0.731***	0.275***	0.847	0.607	0.606
		HSE2	0.845***	0.281***			
		HSE3	0.727***	0.205***			
		HSE4	0.845***	0.287***			
		HSE5	0.738***	0.231***			
	Labels	LAB1	0.770***	0.344***	0.826	0.730	0.437
		LAB2	0.892***	0.426***			
		LAB3	0.895***	0.397***			
	Social Environment	SOCE1	0.864***	0.228***	0.912	0.713	0.418
		SOCE2	0.880***	0.263***			
		SOCE3	0.886***	0.230***			
		SOCE4	0.853***	0.275***			
		SOCE6	0.729***	0.183***			
	OE	OUTCE2	0.843***	0.214***	0.909	0.677	0.606
		OUTCE3	0.848***	0.211***			
		OUTCE4	0.817***	0.194***			
		OUTCE5	0.841***	0.228***			
		OUTCE6	0.773***	0.177***			
		OUTCE7	0.812***	0.190***			
Formative	Emotions	EMO1	0.924***	0.551***	1.958	0.680	
		EMO2	0.872***	0.418***	1.887		
		EMO3	0.638***	0.185***	1.367		
		EMO4	0.326***	0.026	1.114		

Note(s): ***significance level: $p < 0.001$
Source(s): Authors' work

Results of the path model
Figure 1 illustrates the result of the path model, including outer weights of the indicators, as well as path-coefficients and R^2 values of the endogenous variables.

In addition, Table 5 portrays the path-coefficients and effect sizes including their significance levels. Effect sizes of 0.02, 0.15 and 0.35 are interpreted as small, medium and large respectively, as suggested by Cohen (1988).

Intention significantly and positively affected food choice ($p < 0.001$), confirming H1 with a large effect size. Socio-structural variables, label use, and social environment, also significantly influenced intention towards buying fat-reduced yogurts, albeit with small effect sizes ($p < 0.001$), supporting H2a and H2b. However, hypotheses H3a and H3b, positing a positive impact of OE on food choice and intention, were rejected due to non-significant path-coefficients and effect sizes ($p > 0.05$). Similarly, the direct effect of health SE on food choice was not significant ($p > 0.05$), rejecting H4a. Despite a significant but small positive effect of health SE on intention, the negligible effect size ($p > 0.05$) led to the rejection of H4b. Yet, health SE significantly influenced OE and both socio-structural variables ($p < 0.001$) with large and medium effect sizes, respectively, confirming H4c, H4d, and H4e. Emotions significantly influenced food choice ($p < 0.01$) but with a small, non-significant effect size, rejecting H5a. There was no significant effect ($p > 0.05$) of emotions on intention, rejecting H5b. However, emotions significantly ($p < 0.001$) impacted health SE, as well as OE with large effect sizes confirming H5c and H5d. A total indirect effect of emotions was found, leading to H5e to be accepted. In fact, all the specific indirect effects, apart from the ones involving OE, as well as the path through SE and the path through intent leading directly to choice, were found to be significant.

Discussion
This study explored how consumer emotions and SCT variables interact to influence healthy food choices in a shopping context. It found that intention was the primary predictor of food choice, consistent with existing literature on behavior (e.g. Ajzen, 1991) and healthy eating (Miller and Cassady, 2012). This effect was found through indirectly assessing consumer choices using a CBC experiment, whereby interestingly, the often-found intention-behavior gap (e.g. Sheeran and Webb, 2016; Laffan *et al.*, 2023), was not observed to be present in the current study. Contrary to expectations, outcome expectations (OE) and self-efficacy (SE) did not directly affect food choice or intention, diverging from prior studies that highlighted their importance in nutrition behavior (Schwarzer *et al.*, 2018; Sheeran *et al.*, 2016; Renner and Schwarzer, 2005). One reason for this may be the discrepancy between the time frames of the statements that were used to assess the constructs. As explained in the methods section, intentions and choice assessed short-term constructs, whereas OE was targeted at long-term views, suggesting that the effect between OE and intention as well as choice may not be

Predictor variables of intention/choice	Inner VIF values	(R^2)	(Q^2)
Emotions	1.521	n.a.	n.a.
Intention	1.062	0.105	0.031
OE	1.583	0.367	0.259
Health SE	1.590	0.257	0.253
Label use	n.a.	0.131	0.093
Social environment	n.a.	0.139	0.098
Choice	n.a.	0.147	0.022
Source(s): Authors' work			
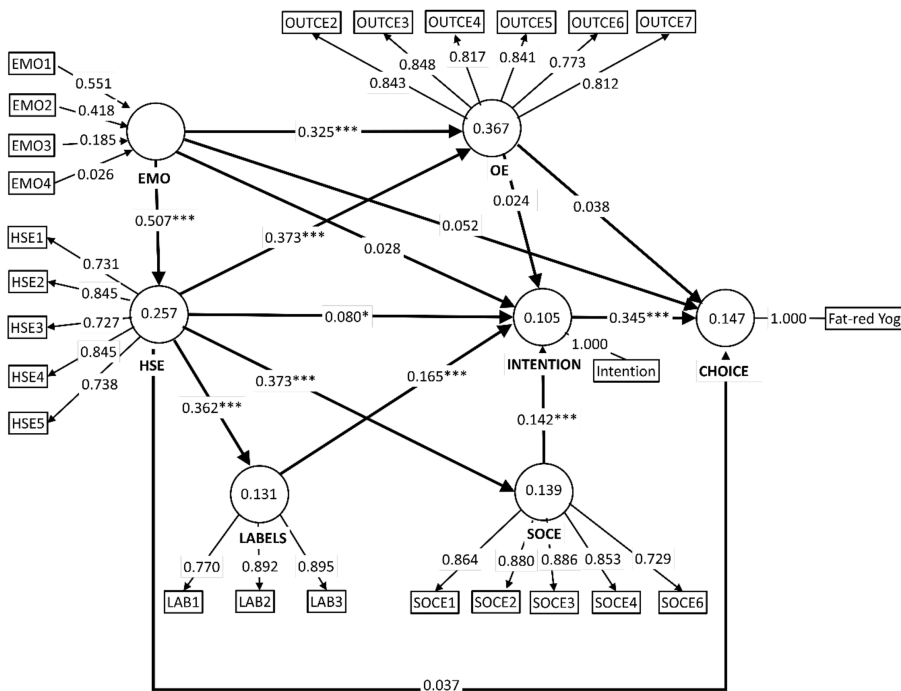
Note(s): *significant at level $p < 0.05$, ***significant at level $p < 0.001$
Source(s): Authors' work

Figure 1.
Final path model

Predictor variables	Path-coefficients	Effect sizes (f^2)
Intention → Food choice (H1)	0.345***	0.131***
Label use → Intention (H2a)	0.165***	0.024*
Social environment → Intention (H2b)	0.142***	0.018*
OE → Food choice (H3a)	0.038	0.001
OE → Intention (H3b)	0.024	0.000
Health SE → Food choice (H4a)	0.037	0.001
Health SE → Intention (H4b)	0.080*	0.004
Health SE → OE (H4c)	0.373***	0.171***
Health SE → Social environment (H4d)	0.373***	0.162***
Health SE → Label use (H4e)	0.362***	0.151***
Emotions → Food choice (H5a)	0.052	0.002
Emotions → Intention (H5b)	0.028	0.001
Emotions → Health SE (H5c)	0.507***	0.346***
Emotions → OE (H5d)	0.325***	0.124***
Emotions → Indirect: food choice (H5e)	0.086***	

Note(s): *significant at level $p < 0.05$, **significant at level $p < 0.01$, ***significant at level $p < 0.001$
Source(s): Authors' work

Table 5.
Path-coefficients and
effect sizes of the
individual predictors

present across measurements that are time-framed divergently. This discrepancy may occur because consumers often sacrifice long-term goals in order to satisfy short-term ones, which results in an off-balance between these goals (Hausman, 2012). Besides that, OE was measured on a general level relating to health benefits, whereas choice was measured on a very specific level (i.e. choosing of fat-reduced yogurt). Yogurt being considered a healthy product in general (Chandan *et al.*, 2017) may have also contributed to the observed lack of effect of OE. Furthermore, the participant's age may have played a role as well, as for some statements specifically younger participants may have portrayed some form of cognitive dissonance between concerns about OE for an older age and food choice today (such as item OUTCE1 or OUTCE6). Another reason for OE not having an effect on intention nor choice in the current model may have been a potential missing mediating variable, such as habits. Food shopping is often described to be a habitual behavior, where numerous decisions are made being automatically triggered by a certain environment, action or social context (Wood and Neal, 2009). In fact, a study using panel data has found that habits seem to have an important effect on yogurt purchasing behavior (Lemmerer and Menrad, 2017). In the current model, HSE impacted socio-structural factors like label use and social environment, which, in turn, were positive predictors of intention, aligning with Bandura's (2004) model. This finding suggests that regular label use may encourage people to choose healthier food products by positively influencing the intentions to do so, which aligns with previous research (Temple, 2020). A reason for this may be increased exposure to information leading to stronger intentions to make health conscious choices. Besides that, increasing levels of HSE may influence the interest and the attention given to these labels and similarly may affect the processing of information or support received from the social environment. Furthermore, support from the social environment may also increase intentions to buy healthier food products by following social norms or adapting the behavior of those around oneself (Robinson *et al.*, 2013). Consumer emotions significantly affected health SE and OE (Bandura, 1997; Klusmann *et al.*, 2016), but not behavior or intention directly. Affect being considered one of the channels informing levels of SE (Bandura, 1997) may be the cognitive reason behind emotions having such a strong impact on health SE. If one has more positive emotions about a task, their estimated ability to perform the task may increase. Similarly, this may be the reason for emotions increasing OE of the behavior. Finally, emotions indirectly influenced choice and intention through other SCT variables, suggesting a complex interplay of factors in making healthy food choices. Furthermore, this finding suggests that consumer emotions may have a stronger indirect than direct effect on choice, which aligns with previous research investigating the link between emotions and consumer choice (Berki-Kiss and Menrad, 2022).

Practical and theoretical implications
These findings have important implications for theory development. First, behavioral models investigating food shopping behaviors, specifically those including social cognitive constructs, should include emotions to some extent, as they have been found to have a central influence on some of these factors. Similarly, in other fields of consumption, the role of emotions has been increasingly analyzed in previous years, often showing a high relevance and important effects of emotions on the purchasing intention or purchase behavior of consumers (White *et al.*, 2019; Berki-Kiss and Menrad, 2022). OE only played a minor role in the current study, suggesting that this variable may only have small relevance to predict intention or behavior in a healthy food shopping context. However, this may have been due to the framing of the statements in terms of time-frame and generality of the scales. This is an important aspect for future theory development to consider, when trying to assess the influence of OE on choice behavior.

As suggested by Ayotte *et al.* (2010), the findings of this study highlight the importance of using a combination of social cognitive constructs when predicting behavior rather than focusing on just one. Therefore, marketers and health interventions should aim to target multiple aspects of behavior. Specifically, consumer emotions seem to play a role by influencing other social-cognitive variables involved in healthy food choice in a supermarket context. Marketers can draw on this finding by adapting their strategies accordingly. Consumer emotions may be induced at the point of sale through videos or music (Siedlecka and Denson, 2018). Another practical finding to consider for marketers is the use of labels to increase healthy food choices. Research supports the use of labels, as they have been found to elicit healthier food choices (Mhurchu *et al.*, 2018). Although some studies suggests that in combination with other nudges, labels may have a long-lasting effect (Thorndike *et al.*, 2014), other investigations found no long-term changes in consumer behavior after label interventions (Cantor *et al.*, 2015). Information campaigns on how to use nutrition labels correctly may increase the use of labels in general and at the same time increase intentions to purchase healthy products. According to Mørk *et al.* (2017), these health campaigns may additionally have a positive effect on healthy food choice. To increase the effects of label use, health interventions could for instance be targeted towards educating shoppers on this topic and could include their social environments, as well as aspects of self-efficacy. The current findings suggest, that interventions including those factors may be especially useful for increasing intentions to purchase healthier food items. Additionally, methods, like stress management, may help to decrease negative emotions when food shopping and may indirectly influence healthy food choice. Stress management in the shopping environment could, for instance, entail good signage and clear communication, a good store layout as well as adequate lighting and music (Aylott and Mitchell, 1998). These findings could support health interventions, as well as marketers to adapt their strategies in order to make consumers feel comfortable and to encourage the purchases of healthy food products.

Limitations and future research
The study's limitations include a formative model that barely met the convergent validity threshold of 0.707 and had one item with a non-significant outer weight. Future research should incorporate a global item in initial questionnaires and re-evaluate the consumer emotion scale items following Pfister and Böhm (2008) and Richins (1997). Additionally, using objective measures like facial analysis (Wolf, 2015) could reduce biases in emotion measurement. While utility values help to understand food preferences, examining direct effects of consumer emotions on healthy food choices through real sales data or field experiments is recommended. The study's focus on a high-income, industrialized country's population also suggests the need for research in diverse cultural and economic contexts. Moreover, the SCT only has a limited number of constructs; future studies should include more variables, such as perceived behavioral control or attitude (Fishbein and Ajzen, 1975), to better understand behavior. Extending the research beyond fat-reduced yogurt to other healthy food choices is also advised for a more comprehensive understanding of healthy food shopping behaviors. Finally, the study at hand used scales with differing time-frames as well as varying levels of specificity. Future research should investigate the connection between the proposed variables using unified scales in order to capture only short or long-term goals and results related to specific or general healthy nutritional aspects.

Conclusion
Unhealthy food consumption is a major health challenge worldwide. Therefore, drivers facilitating healthier food choices must be identified and implemented. Using a PLS-SEM

analysis of a model based on SCT with the addition of consumer emotions, our findings suggest that intention is the strongest, direct predictor of behavior. While self-efficacy, outcome expectancies and emotions did not influence choice, nor intention directly, socio-structural factors, namely, label use and social environment had a positive impact on intention. These socio-structural factors were influenced by self-efficacy, which in turn was influenced by consumer emotions. Indirect effects of emotions on choice, as well as intention were found. These findings offer crucial insights for marketers and health interventions on targeting specific social-cognitive variables to encourage healthier food shopping behaviors. They also guide future research on key social-cognitive factors in healthy food choices, the impact of emotions and their relationship with other social-cognitive constructs.

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Supplementary materials

Level	Fat content (%)	Protein content (%)	Mean utility (Zero-centered diffs)	Standard deviation
Low-fat	*1.7*	*4.3*	*17.1*	*45.4*
Low-fat	*0.3*	*10*	*7.5*	*67.6*
Medium-fat	3.8	4.8	20.5	32.6
Medium-fat	3.8	3.4	17.4	28.0
High-fat	10	2.4	−33.0	49.7
High-fat	10	6.4	−29.5	59.3

Note(s): Italics values indicate the two levels the current study investigated more closely
Source(s): Authors' work, Brückner *et al.* (2023)

Table A1.
Characteristics and mean utility scores for the levels of the attribute "nutrients"

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