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# Hear what I appreciate: activation of consumption motives for healthier food choices across different value segments

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## ABSTRACT

This study represents ‘nudging’ interventions aiming to promote healthier food choices by altering the environment where choices are made, without price incentives. The study focuses on the activation of a consumer’s different consumption motives immediately prior to making food choices, thereby drawing a direct goal-priming approach that is postulated to stimulate congruent behaviours. The twofold purpose of this experimental research is to (1) evaluate the usefulness of direct goal priming when aiming at healthier food choices and (2) to identify the boundary conditions that either favour or inhibit the emergence of motivational priming effects. This purpose contributes to the literature on consumer health behaviour in two ways. First, it reveals new motivational origins for health-goal priming effects. Second, it gleans unprecedented empirical evidence for the moderating capacity of consumers’ values. Direct priming of a health goal proved to be effective in steering consumers towards healthier food options. Surprisingly, however, responsibility and status primes also led to an increase in choices of healthy food products. Moreover, a moderation analysis showed that the consumer’s values (achievement, conservation, and universalism) play an important role in how goal priming works. Thus, the success of priming greatly depends on the underlying values of the consumers.

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consumer values; food  
choice; experimental study

## Introduction

There has been increasing interest among practitioners and policy-makers towards preventing the worldwide rise in obesity (WHO 2016). One way to achieve this is to steer consumers towards healthier food choices in food stores, but the obvious question is how? On the one hand, consumers tend to habitually follow their deep-rooted choice criteria and shopping orientations, but on the other hand, they may also engage in impulsive choices affected by situational factors such as in-store communications and point-of-purchase promotions. It is known that only a limited number of the food choices of consumers are based on conscious elaborations of the pros and cons of a single product. Instead, many of the choices of consumers are impulsive, unconscious and influenced by environmental factors (Dijksterhuis

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et al. 2005). This fact is acknowledged by 'nudging' interventions that aim at healthier food choices by altering the environment where choices are made, but without changing the product prices (Thaler and Sunstein 2008; Wilson et al. 2016).

The review on food-store interventions by Escaron et al. (2013) reveals that both demand-side and supply-side strategies, such as point-of-purchase, pricing, promotion and advertising, increased availability of healthful foods, and combinations thereof, have been used to encourage customers towards healthy food choices. In general, there exists no strong evidence for the effectiveness of such in-store interventions in terms of change in sales of healthy products. Unlike these relatively intrusive interventions, priming is a means for more subtly guiding consumers' behaviour without their awareness (Bargh 2002, 2006; Walsh 2014; Janiszewski and Wyer 2014). For example, food samples can act as primes for healthier or less healthy food choices (Tal and Wansink 2015). However, the same prime can also lead to different, even opposite effects on the choice-making of distinguishable consumer groups, due to a variety of associations attached to it and/or (in)congruency of the prime with the characteristics of the recipient (Wheeler and Berger 2007). To underline the relevance of this insight in the health context, consumers who diet have ironically been shown to end up choosing the unhealthiest side dish more often in the presence of healthy options (menus as primes) than non-dieting consumers (Wilcox et al. 2009). Yet, the role of consumer variability in moderating the effects of primes and nudges on healthy food choices remains underexplored (Wilson et al. 2016).

Based on the preceding discussion, the twofold purpose of this research is to (1) evaluate the usefulness of direct goal priming when aiming at healthier food choices and (2) to identify the boundary conditions that either favour or inhibit the emergence of motivational priming effects. This research contributes to the literature on consumer health behaviour in two ways. First, it reveals new motivational origins for health-goal priming effects. Second, it gleans unprecedented empirical evidence for the moderating capacity of consumers' values, such as by showing that those consumers with more pronounced achievement value are more susceptible to health-goal priming effects. Specifically in this study conducts experiments on how unconscious activation of health, responsibility and status motivation affects consumers' choices of food products. The study contributes to current knowledge on health-motive priming by acknowledging the multiple dimensions that health motivation can encompass and by addressing the role of life values in explaining the priming effects. The present study suggests that prime-induced behaviour change can be better understood by recognizing the prime-relevant cognitive associations. Therefore, in practice, health marketing could benefit from tailored rather than general campaigns due to the motivational complexities of health-driven consumer choices.

## **Development of conceptual framework**

This study focuses on revealing and understanding the prime-induced behaviour changes in consumers' food choices. The study adopts a direct goal-priming approach that is postulated to stimulate behaviours that are supportive of its achievement (i.e. to choose healthy food products) (Janiszewski and Wyer 2014). Essentially, the activation of consumption motives builds upon the assumption that consumers possess a few essential life goals (e.g. health, sustainability, and status), which can affect product choices when triggered by, for example, encounters with environmental circumstances. However, the fact that health

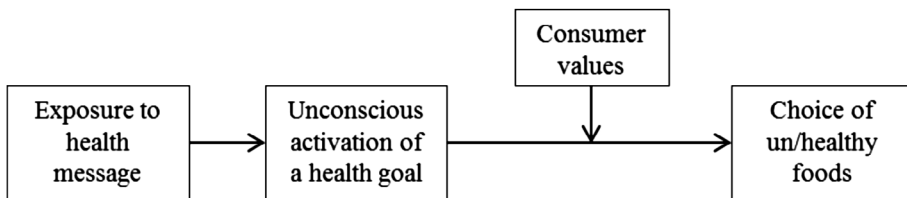
motivation in itself is a multi-dimensional construct poses a challenge as regards to what is being primed and whether the same prime functions similarly across consumer groups. For instance, Geeroms, Verbeke, and Van Kenhove (2008a) have identified six health-related motive orientations: (1) energy, (2) emotional well-being, (3) social responsibility, (4) physical well-being, (5) management and (6) outward appearance. These motives have been shown to diverge in terms of how they affect ready meal consumption (Geeroms, Verbeke, and Van Kenhove 2008b) and the perceived healthfulness of food products (Puska and Luomala 2016).

Life values have been connected to health motive orientations (Lindholm 1997), degree of concern with health (Pohjanheimo et al. 2010) and choices of differentiated (e.g. organic) food (Krystallis, Vassallo, and Chrysohoidis 2012). Linking concrete food choices, consumption motives and life values is in line with the general means-end-chain approach to consumer behaviour (Kitsawad and Guinard 2014). Figure 1 outlines the basic theoretical logic for this research regarding the direct goal priming of health. The key prediction is that exposure to a well-designed visual cue will unconsciously prime consumers' health goals, which will in turn result in a preference for healthier food options. However, as discussed, consumer characteristics can exert a moderating effect in this process. This study proposes for the first time that consumer values as personal factors serve as moderators. This argument leans on the obvious connections between the six health motive orientations (Geeroms et al. 2008a) and the meta-level values classes of Schwartz's value theory (see e.g. Costa, Zepeda, and Sirieix 2014; Caracciolo et al. 2016). More specifically, this study views that the self-enhancement values drive the health motive orientations of outward appearance and self-management, while the self-transcendence values drive social responsibility, the conservation values physical well-being and, finally, the openness to change values the emotional well-being and energy orientations.

The preceding conceptual discussion warrants the following two general expectations:

- (1) Healthy food choices can be induced by priming a range of consumption motives/goals such as health, responsibility and status.
- (2) Consumers' personal values moderate the effect of primed consumption motives/goals on healthy food choices.

The theoretical framework outlined in Figure 1 advances the healthiness concept activation framework of Tal and Wansink (2015) by introducing the moderating effect of consumer values to the food choice process, as discussed above.



**Figure 1.** Conceptual framework of the study.

## Methods

*Study design and development of goal-priming stimuli.* A 4-group between-participants design – health-goal prime vs. responsibility prime vs. status prime vs. no prime – was used. The creation of the goal-priming stimuli proceeded as follows. First, several alternative versions of visual images and slogans thought to prime the aforementioned goals were generated and peer-evaluated. After this screening, they were developed further with a professional ad agency art director. The purpose was to create a subtle prime that is capable of activating health, responsibility and status goals without typical commercial contents (i.e. direct references to brand, price, package). Then, an online pre-study with 99 Finnish respondents of different age ( $M = 39.5$ ,  $SD = 14.2$ ) and gender ( $M 52\%$ ) was conducted to test the evoked associations and suitability of the final priming stimuli (see Table 1).

The respondents were asked to write about the immediate associations that the messages evoked, whether they liked those messages (scale 1 = 5), and what kind of food products they consider to be healthy in general. In addition, a series of questions was devised to explore what kind of food products the respondents thought the messages could be promoting. The respondents were to use a scale of 1–7 (7 = clearly promotes) to rate twelve predetermined alternatives: light products, traceable local products, trendy specialty products, seasonal products, discount products, organic products, quality brand products, ready meals, premium products, food products with no additives, fair trade products and heart healthy-labelled products. As expected, the developed messages prompted associations consistent with the health, responsibility and status goals. Paired t-tests (with a threshold  $p < 0.05$ ), presented in Table 2, verified that the health message promoted light products, trendy specialty products and seasonal products more effectively than the responsibility message, whereas the responsibility message promoted traceable local products, organic products and health-label products more effectively than the health message. The status message promoted trendy specialty products, quality brand products and premium products more effectively than the health and responsibility messages. In conclusion, the results of the pre-study indicate that the three messages crafted are indeed able to prime health, responsibility and status goals, respectively.

## Main study

For the consequent survey, another sample, of 654 Finnish respondents of different age ( $M = 46.2$ ,  $SD = 23.3$ ) and gender ( $M 34\%$ ) was recruited and divided in four groups. Study participants were informed that the survey dealt with food consumption issues and consisted of several unrelated parts. First, participants were asked to watch a video (goal-priming stimuli on a video clip). As a cover story, the respondents were asked to evaluate the video as a communication tool intended for showing at a food store during a campaign week. This task was set to unconsciously activate the specific consumption motivation of a respondent. Then two filler tasks were posed in order to ensure that the link between manipulation and the consequent food choices would not be evident to the respondents. These tasks included questions about the respondents' backgrounds and food preferences. According to the check at the end of the survey, this procedure succeeded, since all primed respondents were unaware of the specific purpose of the study. No video was presented to the control group participants, but their survey started with the filler tasks described above.

**Table 1.** Goal-priming stimuli tested in the pre-study.

Primed goal	Slogan translated	The stimulus
Health	Feel good!	
Responsibility	Choose wisely!	
Status	Make an impression!	

Next, participants were asked to make grocery choices for themselves from the set of alternatives provided. Altogether, there were 14 product categories, with four alternatives in each. Participants were encouraged to pick the product that they found most appealing at that moment. Seven of the product choices were filler tasks having four indifferent alternatives in terms of healthiness, status, and responsibility (such as penne, fusilli, spaghetti and farfalle pasta); the seven focal product categories were coffee, yoghurt, pork cold cuts, orange juice, gouda cheese, chicken fillet strips and eggs. In each, the four product alternatives were deliberately devised to convey symbolic meanings of (1) health, (2) responsibility or (3) status or (4) a minimal degree of symbolism (reference option). To illustrate, the yoghurt

**Table 2.** Paired *t*-tests.

	Message <i>M</i> (SD)	Pair	<i>T</i> -test value ( <i>p</i> -value)
Light products	H 3.88 (2.09)	H-R:	6.22 (0.000)
	R 2.71 (1.77)	H-S:	8.34 (0.000)
	S 2.23 (1.60)	R-S:	2.60 (0.011)
Traceable local products	H 3.38 (1.85)	H-R:	-6.33 (0.000)
	R 4.47 (1.95)	H-S:	10.68 (0.000)
	S 2.34 (1.59)	R-S:	6.03 (0.000)
Trendy specialty products	H 3.46 (1.94)	H-R:	7.35 (0.000)
	R 2.47 (1.52)	H-S:	-7.59 (0.000)
	S 4.08 (2.04)		
Seasonal products	H 4.26 (1.87)	H-R:	3.15 (0.002)
	R 3.75 (1.85)	H-S:	3.68 (0.000)
	S 3.06 (1.86)	R-S:	6.25 (0.000)
Discount products	H 2.64 (1.67)	-	
	R 2.48 (1.65)		
	S 2.46 (1.67)		
Organic products	H 4.49 (1.90)	H-R:	-3.90 (0.000)
	R 5.08 (1.80)	H-S:	10.86 (0.000)
	S 2.72 (1.77)	R-S:	9.44 (0.000)
Quality brand products	H 3.55 (1.89)	H-S:	-4.94 (0.000)
	R 3.27 (1.88)	R-S:	-3.67 (0.000)
	S 2.46 (1.83)		
Ready meals	H 2.32 (1.53)	H-S:	-2.27 (0.000)
	R 2.12 (1.39)		
	S 2.46 (1.83)		
Premium products	H 3.47 (1.63)	H-S:	-4.07 (0.025)
	R 3.42 (1.85)	R-S:	-4.51 (0.000)
	S 4.29 (2.03)		
Food products with no additives	H 4.79 (1.83)	H-S:	10.23 (0.000)
	R 4.70 (1.87)	R-S:	10.89 (0.000)
	S 2.77 (1.76)		
Fair trade products	H 3.75 (1.92)	H-S:	8.37 (0.000)
	R 4.04 (1.92)	R-S:	7.47 (0.000)
	S 2.54 (1.75)		
Heart healthy-labelled products	H 3.92 (2.11)	H-R:	-2.74 (0.007)
	R 4.42 (2.12)	H-S:	8.07 (0.000)
	S 2.63 (1.77)	R-S:	6.78 (0.000)

Note: H = Health message, R = Responsibility message, S = Status message.

choice set included (1) berry yoghurt with no added sugar (health-symbolizing option), (2) ecological oat-based berry yoghurt (responsibility-symbolizing option), (3) gourmet yoghurt with real berries (status-symbolizing option) and (4) basic berry yoghurt (reference option). The presentation order of the options varied randomly.

After all of the food product choices were made, respondents were asked to answer a ten-item scale drawn from Schwartz's value survey (Lindeman and Verkasalo 2005), and to rank (1 = most important; 7 = least important) their general food choice criteria (quality, ethicality, price, health, mood, convenience and image management) when making grocery purchases. Lastly, participants were asked the purpose of the study and whether they saw a connection between the different sections of the survey. None of the participants perceived a connection between the campaign message evaluation and choice tasks.

In the data analysis, the dependent variable, healthy food choices, was tapped both at the product level (frequencies and percentages) and at the index level. This index measure was formed (as in prior studies, see e.g. Wheeler and Berger 2007) by summing up the number of times a participant preferred the healthy option over others (theoretical range 0-7). In addition, personal life values and the importance of various grocery shopping criteria were postulated as moderators to be assessed.

## Results

First, it was examined whether the three priming efforts had effects on choices at a product-specific level. Table 3 summarizes the main findings. There were product-specific differences between the health-primed and control group for choices of yoghurt ( $\chi^2$  13.89,  $p = 0.003$ ) and pork cold cuts ( $\chi^2$  7.82,  $p = 0.05$ ). A health-primed group chose significantly more often the healthy option of yoghurt than the control group did (58.9% vs. 39%). Similarly, the health-primed group chose lighter pork cold cuts more often than the control group did (26.4% vs. 14.0%). No other differences were found between the primed groups and the control group regarding choices at the product-specific level.

The seven target measures were also summed (as in prior studies, e.g. Wheeler and Berger 2007) to yield a choice index (0–7) for (a) healthy, (b) responsible, (c) status and (d) ordinary food products. Somewhat surprisingly, the overall product index-based analyses of variance yielded significant differences for healthy product choices, no matter which priming was used. Each primed group chose healthy products significantly more often when compared to the control group, see Table 3. Even more surprisingly, the responsibility-primed group chose significantly fewer responsible products in total when compared to a control group. The findings show that unconscious priming can have an effect on product choices, but the effect may be different from or even opposite to what is expected.

Next, the role of values explaining consumer choices was analysed in order to see whether there are differences in the effects of priming across value segments. For this purpose, both the pre-test survey and the main survey included 10 seven-point Likert-scaled Schwartz value items, see Appendix 1 for details. A principal component analysis was conducted for the data-set (n426), combining answers from the pre-test (n99) health-primed group (n163) and control group (n164) in the main study. KMO test (0.76), Bartlett's test of sphericity (1.194,  $p = 0.000$ ) and communalities varying between 0.49 and 0.73 indicated that the data is suitable for factor analysis. The resulting three factors of (1) universalism, (2) achievement and (3) conformity explained 63.4% of the total variance and had satisfactory internal consistencies in terms of Cronbach alpha values: 0.67, 0.72 and 0.75, respectively. The universalism factor included three values referring to openness to change (universalism, self-direction, and benevolence). The achievement factor included four values referring to

**Table 3.** Priming effects on product-specific and product-index choices in comparison to a control group.

Health prime	Responsibility prime	Status prime
The primed group chose the healthy yoghurt option more often $\chi^2$ 13.89, $p = 0.003$	No differences in product-specific choices	No differences in product-specific choices
The primed group chose the healthy pork cold cut option more often $\chi^2$ 7.82 $p = 0.05$		
The primed group chose more healthy options in total $F(1, 326) = 8.00, p < 0.05$ $M$ 1.43 (SD 1.23) health group, $M$ 1.06 (SD 1.13) control group	The primed group chose more healthy options in total $F(1, 326) = 9.61, p < 0.05$ Responsibility group: $M$ 1.48 (SD 1.32) Control group: $M$ 1.06 (SD 1.13)	The primed group chose more healthy options in total $F(1, 325) = 5.27, p < 0.05$ Status group: $M$ 1.37 (SD 1.29) Control group: $M$ 1.06 (SD 1.13)
	The primed group chose fewer responsible options in total $F(1, 326) = 4.04, p < 0.05$ Responsibility group: $M$ 2.00 (SD 1.34) Control group: $M$ 2.32 (SD 1.51)	



individualistic goals (power, achievement, stimulation and hedonism), and the conformity factor four values referring to appreciating joint goals and conservation (conformity, security, tradition and benevolence). Finally, index variables were computed for the factors to achieve median splits for further analyses on possible interaction effects between priming and values.

Two-way analyses of variance showed interesting interaction effects between priming and values, thereby deepening the understanding of the results of priming. First, members with a high achievement value from a health-primed group chose healthy food products significantly more often compared to members of a control group who had a similar value profile but were not exposed to a health prime, see Figure 2.

An interaction effect,  $F(1, 323) = 4.75, p < 0.05$ , was found for a health prime and the achievement factor, whereas other value factors did not have an interaction effect with a health prime (conservation  $F(1, 323) = 0.50, p > 0.05$ , universalism  $F(1, 323) = 2.87, p > 0.05$ ). A simple effects analysis showed that when the achievement value was high,  $F(3, 323) = 12.90, p < 0.01$ , the health prime led to an increase in choices of healthy products ( $M = 1.30$  in low vs.  $M = 1.52$  in high achievement value). In contrast, the control group's choices of healthy products decreased in the case of a high achievement value ( $M = 1.24$  in low vs.  $M = 0.90$  in high achievement value).

Second, members with a high *conservation* value from a responsibility-primed group chose *healthy* food products significantly more often compared to members of a control group who had a similar value profile but were not exposed to a responsibility prime, see Figure 3.

An interaction effect,  $F(1, 323) = 5.21, p < 0.05$ , was found for a responsibility prime and the conservation value factor, whereas other value factors did not have an interaction effect with a responsibility prime (Universalism  $F(1, 324) = 1.84, p > 0.05$ , Achievement  $F(1, 324) = 0.87, p > 0.05$ ). A simple effects analysis showed that when the conservation value was high,  $F(1, 324) = 14.28, p < 0.01$ , the responsibility prime led to an increase in choices

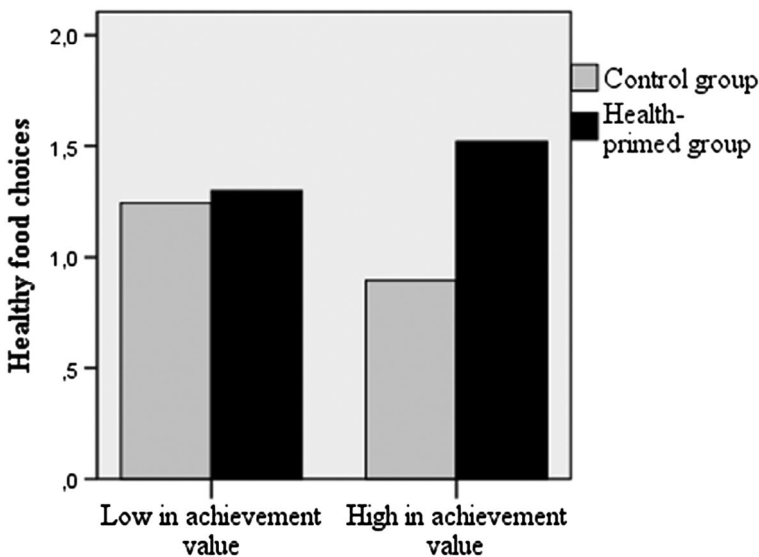


Figure 2. Interaction effect between a health prime and achievement value.

of healthy products ( $M = 1.27$  in low vs.  $M = 1.67$  in high conservation value). In contrast, the control group's choices of healthy products decreased in the case of a high conservation value ( $M = 1.16$  in low vs.  $M = 0.95$  in high conservation value).

Third, members with a high *universalism* value from a status-primed group chose *healthy* food products more often compared to members of a control group who had a similar value profile but were not exposed to a status prime, see Figure 4.

An interaction effect,  $F(1, 323) = 6.32, p < 0.05$ , was found for a status prime and the universalism value factor, whereas other value factors did not have an interaction effect with a status prime (achievement  $F(1, 324) = 1.719, p > 0.05$ , conservation  $F(1, 323) = 3.23, p > 0.05$ ). A simple effects analysis showed that when the universalism value was high,  $F(1, 323) = 11.62, p < 0.001$ , the status prime led to an increase in choices of healthy products

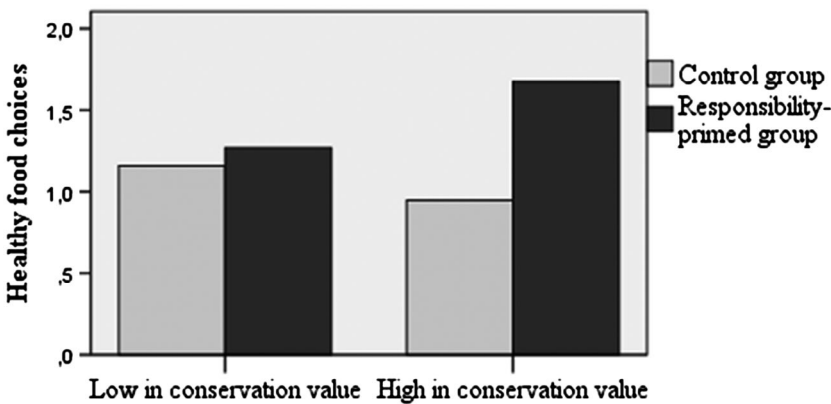


Figure 3. Interaction effect between a responsibility prime and conservation value.

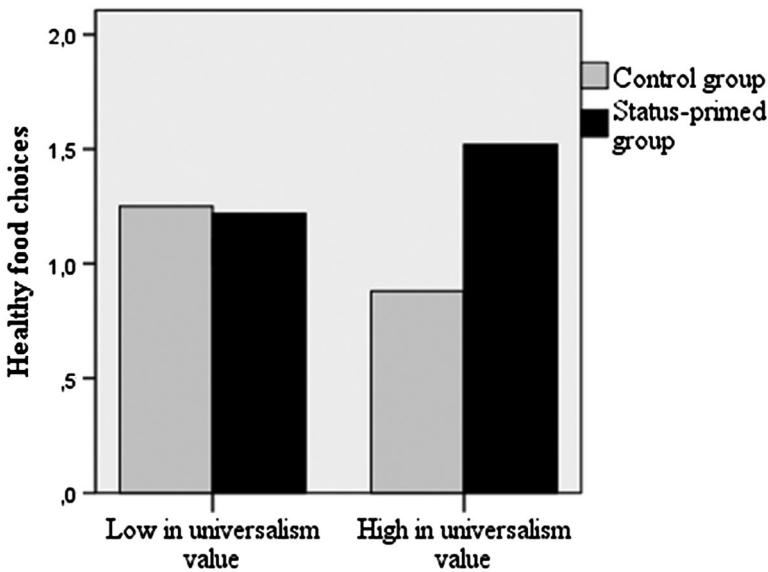


Figure 4. Interaction effect between a status prime and universalism value.

( $M = 1.22$  in low vs.  $M = 1.52$  in high universalism value). In contrast, the control group's choices of healthy products decreased in the case of a high universalism value ( $M = 1.25$  in low vs.  $M = 0.88$  in high universalism value).

The findings of the study suggest that healthy food product choices can be increased by activating different consumption motives prior to choice making. However, the success of priming greatly depends on the underlying values of the consumers, as the three key findings above indicate. In line with the findings of Wheeler and Berger (2007), our results highlight the importance of understanding personal associations to primes and the need to account for diversity across consumers as these may have an influence on the priming effects.

As a background question, the respondents in each group were asked to rank seven predetermined factors (responsibility, health, quality, price, convenience, mood and image reasons) on a scale of 1–7 according to their general criteria when shopping for groceries. Responses were recoded to two classes (rank 1–3 = important to respondent, rank 4–7 = not important) to analyse whether general food choice criteria can explain the differences in healthy product choices. As expected, importance of a *health criterion* (n185) led to an increased number of healthy product choices  $F(1, 326) = 5.44, p < 0.05$ , whereas non-importance of the health criterion (n142) explained the choice of 'basic' reference products  $F(1, 326) = 15.32, p < 0.001$ . More interestingly, the importance of the health criterion was also positively related to the number of responsible product choices,  $F(1, 326) = 5.20, p < 0.05$ , indicating that responsible food products (organic, fair trade, local) are considered healthy as well. This finding supports the notion of the intertwined nature of healthy and responsible eating. In addition to the health criterion, *mood* was a relevant factor in explaining choices of healthy food. Those who valued the mood criterion highly (n71) chose statistically significantly fewer healthy products than those (n256) who placed a low emphasis on this criterion,  $F(1, 326) = 4.81, p < 0.05$ . Other criteria did not play an evident role in choices of healthy products.

## Discussion and conclusions

In this experimental study, a positive main effect of a health motive priming was found for consumers' choices of healthy food products. The activation of health motivation was implemented without direct human interventions, advertising, brand marketing or price discounts. Thereby, possible associations and motivations raised by the prime were not affected by a human factor or brand symbolism, which are difficult to control. Influencing food choices through health motive priming proves to be a viable effort when trying to steer consumers towards healthier food options. However, the present study suggests that prediction of prime-induced behaviour change can be improved by understanding the prime-relevant cognitive associations, especially the values of the consumers. An analysis of the moderating effects of values showed that a high valuation of achievement has an interaction effect with the health prime, indicating that health is associated with greater achievements in life and consumers with more pronounced achievement values are more susceptible to health-goal priming effects. Accordingly, a health-motive prime targeted to people valuing individualistic goals (power, achievement, stimulation and hedonism) could benefit from emphasizing this aspect.

Somewhat surprisingly, a responsibility prime also led to increased choices of healthy food products, especially among those with a high valuation of conservation (conformity,

security, tradition, benevolence). This finding suggests that not only health, but also responsibility is a many-sided construct denoting aspects such as social and societal responsibility. Unexpectedly, the responsibility-primed group chose responsible products less than the control group, which is a finding that certainly merits further investigation. A backfire effect could have been a reasonable explanation if the message had been directed at the respondents themselves, but this was not the case in this experiment. Maybe a better explanation would be that a direct goal priming approach does not work equally well in other than health-related campaigns, but another type of intervention would be needed. In line with this, status priming did not succeed in increasing choices of status-symbolizing options in this study. Another plausible explanation would be that behaving responsibly and gaining status were not as prevalent consumption motives as was healthiness for the respondents, which makes the goal priming not as effective in the case of such motives.

In addition, not surprisingly, healthfulness as a general food choice criterion was found to explain the choices of healthy food products in this study. In contrast, the importance of mood as a choice criterion had the opposite effect. Therefore, further research should dig deeper into the specific dimensions of health and mood motives behind consumers' food choices in order to better understand the phenomenon and develop targeted priming contents. The finding points to the importance of developing in-store interventions that could alter the effect of mood on food product choices.

The next step in this line of study would be a field experiment in a real retail environment with a direct goal priming approach. Despite the promising findings achieved in the current experiment, a grocery store environment would likely pose a real challenge. This is due to many possible distractions, such as seasonal campaigns and economic incentives, which can hinder activation or at least decrease its effect. In a retail environment, priming could be done for example by presenting video material on in-store displays located in several spots around the grocery store to prime a consumption motive and sustain it in a consumer's mind during shopping.

In the end, direct goal priming can be considered a sophisticated and subtle way of nudging that maintains the freewill of consumers, as it changes only the environment, not the available product choices or economic incentives. It is also a relatively easy way of implementing an intervention, as it does not require any changes in product labelling or in a store layout.

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**Harri Luomala** is a research professor in the Department of Marketing, University of Vaasa, Finland. His research interests include the consumer-oriented food product development, and the interrelationships between values, emotions, motives and taste perceptions in food consumption. He collaborates closely with food development organizations and has published in several academic journals.

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## Appendix 1. Principal component analysis

'How important these values are for you' (Likert-scale 1–7)	Conservation	Achievement	Universalism
Conformity (obedient, honouring of parents and elders, self-discipline, politeness)	0.845		
Security (national security, family security, harmony and stability of society)	0.760		
Tradition (respect for and acceptance of the customs and ideas that traditional culture or region provide, humble, devout, moderate)	0.730		
Benevolence (helpful, honest, forgiving, loyal, reliability, true friendship)	0.606		0.566
Achievement (successful, capable, ambitious, accomplishment, hard-working)		0.800	
Power (authority, social power, social influence, wealth)		0.773	
Stimulation (adventurous life, challenge in life, a varied life, exciting life)		0.656	
Hedonism (pleasure, enjoying life, gratification for oneself)		0.527	
Universalism (broad-minded, social justice, protecting the environment, a world at peace, equality)			0.764
Self-direction (creativity, freedom, curious, independent, choosing own goals)			0.713

Notes: Extraction Method: Principal Component Analysis. Varimax rotation with Kaiser Normalization.