



INFORMED NUDGES

The Effect of Pre or Post Informing About Motives and Mechanisms of Nudge Based Behavioral Interventions

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ABSTRACT

Nudge based behavioral interventions are increasingly used to address emerging health challenges such as obesity, by helping individuals avoid known human psychological and behaviorally based biases and errors when exercising choice. Nudges are seen as cost effective substitutes for traditional information provision in food choice situations, helping people to avoid conflict between short term pleasure and long term welfare. Nudges are also regarded as manipulative by neglecting the importance of information and knowledge, posing a threat towards people's ability to form conscious preferences and intentions, and ultimately be responsible for their own choices. Considering perceptions and attitudes towards these concerns of manipulation, knowledge and information, an experiment is conducted where motives and mechanisms of a manipulative behavioral intervention are revealed before or after a snack choice. Key findings include a pre and post information difference in; 1) The support to manipulative choice design for health promoting behavioral interventions, giving indications that in addition to information content, timing is a critical element to secure long term effectiveness of nudges; 2) The value of knowledge regarding choice influencing, indicates importance of timing of information provision, experience and reflection when designing nudges as part of holistic participatory behavioral change strategies. The results also support educational value of using timing in information provision to demonstrate value of nudge based behavioral interventions. Differences in effect of timing information appear in perceptions and attitudes depending on whether experiences are directly or indirectly and whether reflections are directed to current or future issues. Further research on this matter is suggested as although indications are weak; this may contribute to explaining behavioral discrepancies between short and long term consequences of choice. Design of nudges that link individual involvement and experience based information provision, can become valuable additions to health promoting strategies, but more understanding is needed to support use with other tested and applied tools used to empower individuals to live a healthy life.

Keywords: Nudges, choice architecture, manipulation, knowledge, information, health promotion, behavioral interventions, individual involvement, empowerment.

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INTRODUCTION

In today's globalized system of food production, distribution and consumption, there are striking contrasts. Unacceptable numbers of humans today suffer from malnutrition due to scarcity of food, while others suffer the consequences of abundance. Today's modernized societies show clear symptoms of unsustainability with disruptive effects on the natural environment (water scarcity, deforestation, desertification, greenhouse gases), on human societies (hunger, food distribution, resource distribution, waste) and on the individual health and wellbeing, such as increased obesity. Among large contributing factors to rising obesity is the increase in consumption of highly processed, easily prepared foods for home or out of home consumption (Vogli, Kouvonen et al. 2013) in modern industrialized societies, where food related consumption is largely shaped by few large professional food industry companies (Euromonitor 2009, IBIS 2013, Røsnes 2014).

Human behavioral factors are increasingly seen as strongly contributing to the current situation, and are also seen to be important in the reversal of this development. Policy methods developed on basis of insights from behavioral science are seen as ways to improve food policy, partly due to less administrative burden and partially as consumption is considered private and sensitive to policies of coercive nature (Wahlen, Heiskanen et al. 2010).

This development to understand the importance of behavioral factors to explain consumer behavior can be traced to criticism on the assumption on rational-agents to explain human activity (Simon 1955), bounded rationality (Simon 1972), and a two system architecture of cognition (Stanovich and West 2000) consisting of two systems: System 1, or the "intuitive" system operating fast, automatic and effortless, mixing thoughts, action, emotions and habit. System 2, or the "rational" system handles thoughts slower and effortful in a serial manner, and is therefore involved in all "judgments" (Kahneman 2003). When faced with difficult tasks, such as assessing probabilities or predicting outcomes of events people tend to utilize the convenience of system 1, which leads to development of heuristic principles to simplify judgmental operations. This is helpful in everyday situations, but may also lead to serious biases and errors (Tversky and Kahneman 1974). These conflicts surface in various real life situations such as saving money (Laibson, Repetto et al. 1998), borrowing money (Sunstein 2006), acting environmentally friendly (Kollmuss and Agyeman 2002) donating organs (Kahnemann 2011, p.373.) or donating money (Small, Loewenstein et al. 2007). Food deci-

sions are particularly prone to irrational decisions as food serves both a utilitarian purpose and a hedonic purpose, creating a tension between actions that promote long term welfare and what gives a short term pleasure, and as food decisions are often made under stressful conditions food decisions are made with little cognitive involvement (Just 2008). As food consumption is primarily governed by automatic processes, interventions that intend to influence food consumption can effectively employ tools that exert these behavioral insights rather than using cognitive reasoning (Just 2006). Strategies that supplement traditional information providing with changes in physical choice making contexts, based on insights from behavioral science are likelier to “nudge” people towards reduced calorie intake (Liu, Wisdom et al. 2014). Nudges build on research from behavioral science, emphasizing on changing context – the choice architecture, and thus nudging people in particular directions (Dolan, Hallsworth et al. 2012). A nudge *“is any aspect of the choice architecture that alters people’s behavior in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid”* (Thaler and Sunstein 2009, p.6.).

In Thaler and Sunstein’s book „Nudge“, a fictitious example is given of Carolyn, a director of food services for a large city school system is in charge of hundreds of schools tests the effect of a deliberate rearrangement of food choices in a school cantinas without removing any choices from the menu. The results were positive and demonstrated the effect of changing contexts to influence choices. Carolyn is a choice architect; where *„a choice architect has the responsibility for organizing the context in which people make decisions“* (Thaler and Sunstein 2009, p.1-3.), helping people make better choices, based on their own judgement, and without forcings certain outcomes upon them (Thaler, Sunstein et al. 2010).

Various criticisms have been raised regarding Nudging. Concerns have been raised about risk of obscuring paternalistic interventions from view, potentially leading to a unwanted development, such as transfer of coercive power to others (Mitchell 2004, Whitman 2010), while others reject nudges as bad substitutes for paternalistic regulating, as they do not promote rational choices, while still allowing people to make bad choices, suggesting more emphasis in line with publicly accepted coercive interventions such as seat belt and smoking regulations (Conly 2013). Other aspects of criticism are directed to weakening of individual ability to make moral choices (Furedi 2013), substituting independent individual thought by effectively doing people’s thinking for them (Klick and Mitchell 2006, Jones, Pykett et al. 2011) and

diminishing individual capacities for autonomous decisions by manipulating choices (Bovens 2008, Hausman and Welch 2010).

The above discussion highlights some of the advantages and disadvantages of applying nudges to help people align their intentions and behaviour. A common theme of critics appears to go along the line of avoiding manipulation and to preserve people's ability to form conscious preferences and intentions, and ultimately be responsible for their choices. As people evidently seem to suffer from time related discrepancies when serving the two cognitive systems, the timing of help may also be of importance when designing interventions that align people's current behavior with their long term goals.

The objective of this paper is to investigate how timing of information regarding food choice design with intervening motives (choice architecture) can influence perception of manipulation, the perceived value of knowledge and information and attitudes towards behavioral interventions. A distinguishing is made between perception and attitudes where a perception is directed narrowly to one self, and an attitude that has a broader applicance.

To increase insight into these considerations, the following research questions were posed:

Does difference in timing when providing information on motives and mechanisms of a manipulated food choice (before or after making a food snack choice) lead to differences in responses regarding;

Perception towards manipulation or influencing of choices.

Perception towards value of knowledge and information about the motives and mechanisms of behavioral interventions.

Attitude to health promoting interventions.

Do other differences of importance appear through further exploring of results, such as demographic or related to choice?

METHODOLOGY

OVERALL APPROACH

In order to answer the research questions, an experiment was designed to be conducted at entrances of canteens at NMBU – The Norwegian University of Life Sciences in Ås, Norway. Choosing to use an out-of-home eating location over a grocery store location for the experiment was made due to the following reasons: Food consumption is on a global out-of-home dining trend (Lin 2013); The food consumption happens in a controllable environment, making it possible to design, apply and evaluate behavioral interventions to influence food consumption; Various examples of nudge based experiments in canteen and cafeterias served as an inspiration to conduct such an experiment; Finally, the NMBU University canteens provided good access to locations for facilitating an experiment.

EXPERIMENT DESIGN

The key design feature of the experiment is to position a snack awarded for participating in survey in a deliberately manipulated way, where a healthier snack choice is placed more accessible than a less healthy snack choice. Here the choices are differentiated in the following way: Green Snack #1, which contains two possible choices of green grapes and a nut mix. The color green is used for the bowl and for a sign indicating the name and number of the choice; Red Snack #2, which contains an assortment of small chocolates, where the color red is used for the bowl and sign. Half of participants are pre informed of this arrangement. The other half are post informed.

The experiment design assigns participants randomly to one of two treatment groups, and variables are applied in a different order, leading to a difference in the process up to answering a questionnaire on the experience:

Pre informed group (Treatment group 1): Information > Choice > Questionnaire.

Post informed group (Treatment group 2): Choice > Information > Questionnaire.

The only difference between treatment groups is that group 1 receives information before encountering the food choice, while group 2 receives the information after choosing a snack. Each group are allowed to select one snack before answering the questionnaire.

The following information is provided to the two groups:

Pre informed: *You are about to participate in a simple experimental survey. You will be offered a choice between a healthy snack (Green bowl, marked #1) and a less healthy snack (Red bowl, marked #2). The snacks were deliberately positioned in such way to promote the healthier option. This is done by selecting a green color for the bowl, and placing it easily reachable. The unhealthier snack option is placed in a red bowl and further from reach. You are free to choose which ever snack you desire, but the choice is limited to only one snack. Please answer the rest of the questionnaire after you have selected your snack, and return it to the survey conductor.*

Post informed: *You have chosen one of two snacks. Either a healthy snack (Green bowl, marked #1) or a less healthy snack (Red bowl, marked #2). The snacks were deliberately positioned in such way to promote the healthier option. This is done by selecting a green color for the bowl, and placing it easily reachable. The unhealthier snack option is placed in a red bowl and further from reach. Please answer the rest of the questionnaire and return it to the survey conductor.*

The experiment does not have a control group to compare the results with. The decision not to include a control group was primarily made to limit the complexity of the experiment, and keep focus on the difference of the two treatment groups. It was also considered difficult to expand the survey in the limited population without risking diffusion of treatments (Bernard 2002).

The experience is designed as a structured interview, which in this case fits well for a self-administrated questionnaire, as the following three factors apply; 1) literate respondents 2) high response rate expected 3) not need for face-to face discussions or explanations (Bernard 2002).

The questionnaire is divided into five parts;

Part:	Measurement purpose:
0. Introduction & Snack Selection	Categorize & divide groups.
1. Snack Selection – Choice	Reasons for snack choice.
2. Snack Selection - Placement & Colors	Perceptions when reflecting on experience.
3. Snack Selection – Availability	Attitude to health promoting means.
4. Demography	Classification for analysis.

The objective of each part is as follows:

Part 0 has the objective to inform participants about the motives and design (the choice architecture) of the experiment area. This is used to categorize the groups depending on when information is received and what is selected. Part 1 is intended to reflect on the reason for snack selection, and is primarily intended as a “warm-up” for the following parts of questionnaire which are linked to the research question. Having the questions in the same format as the following parts also gives possibility to familiarize with the questionnaire structure. In Part 2, participants reflect on the experience from the experiment and report their perceptions to statements regarding placement of choices and use of colors. The former is related to the research question, while the latter is added to create a variety to the questions in this part and make the research focus less obvious to participants. In Part 3 participants express attitudes to possible means to promote healthier snack choices. Finally Part 4 provides possibility for classification of results to look for demographic differences in responses to questions.

The following statements are designed to answer the research objectives:

Perception towards manipulation or influencing of choices.

Question 2.1: *This experience makes me aware that my snack choices can be influenced.*

Question 2.3: *Placing the unhealthy snacks further from reach influenced my choice of snack¹.*

Question 2.5: *Placing the unhealthy snacks further from reach was an attempt to manipulate my choice.*

Question 2.6: *Promoting healthy food choices does not justify manipulation of choices.²*

Perception towards value of knowledge and information about the motives and mechanisms of behavioral interventions.

Question 2.2: *Knowing the reasons for the placement of snacks makes (could have made³) me more aware of my choice.*

¹ This statement was dropped from data analysis, due to an error in part of questionnaires.

² The wording of this statement was reversed in data analysis as this wording was seen as confusing.

³ The wording differed on pre and post informed questionnaires.

Question 2.4: *Providing information about the snack placements (could have⁴) influenced my choice of snack.*

Question 2.7: *Knowing how choices can be influenced helps me take better care of my health.*

Attitude to health promoting interventions. People can be helped by:

Question 3.1: - *Making unhealthy snacks physically less accessible. (By placement).*

Question 3.2: - *Providing relevant product information that supports healthier snack choices.*

Question 3.3: - *Simply not allowing unhealthy snacks (Government regulation).*

Question 3.4: - *Changing taxation to improve pricing of healthy snacks compared to unhealthy snacks.*

Question 3.5: - *Providing information to increase awareness of how snack choice can be influenced.*

Question 3.6 - *Running campaigns to build positive image around healthy snacking.*

Question 3.7: - *Allowing each person to make snack choices according to their own preference.*

Non research related questions.

Question 2.8: *Use of colors can help me make a healthier choice of snack.*

Question 2.9: *I associate the color red with unhealthier snack choices.*

All statements are designed to be answered on a 5 point likert scale, measuring to what degree (partly or fully) participants agreed or disagreed with statements. This approach was considered relevant to keep answering alternatives simple and comprehensive, as well as simple and effective data registration. Having “don’t know” as an option is regarded important as the research focuses on aspects of knowledge and information.

⁴ The wording differed on pre and post informed questionnaires.

Testing of the questionnaire was conducted through a pilot test and various other inputs such as discussions with thesis supervisor and peers.

IMPLEMENTATION

The population for the survey was students, employees and other visitors in the NMBU area during the survey period. The overall population was estimated to be around 7.000, with around 5.000 students, 1.700 employees (NMBU 2013) and few hundred visitors / guests / non-permanent workers. The experiment was conducted in 5 university cantinas in the NMBU campus area, in cooperation with SIAS, the cantina operator. The artifacts used in the experiment consisted of tables, chairs, bowls, signs and stationary. Pictures from the experiment areas can be seen in Appendix B.

For the purpose of randomization the following steps were taken:

- 1) Sample size to be over >50 Target 200 participants
- 2) Period > 1week. Target 2 weeks.

The following other measures were taken to reduce biases:

- a) Between week days: Distribution from Monday-Friday.
- b) Within work day: Distribution from morning / noon / afternoon.
- c) Between Campus cafeterias: 5 cantina locations.

The survey sampling is done through systematic random sampling, where sampling interval is predefined (Bernard 2002). This was conducted by placing the experimental area close to the entrance of the cantina where people naturally pass by. Conductors were instructed to randomly approach people and invite them to participate in experiment. An interview guide was prepared to reduce both observer and participant bias (Robson 2011). Interviews were conducted by 3 male and 3 female interviewers.

The survey material did not include personal information that can in any way be linked back to participants in survey. According to guidelines from the Norwegian department of personal protection the survey did therefore not require reporting.⁵

⁵ <http://www.nsd.uib.no/personvern/meldeplikt/meldeplikttest>

DATA ANALYSIS

222 forms from respondents in the survey were registered in SPSS 21 for statistical analyzing.

The distribution of responses by cantinas was: Cantina 1 (Sørhellinga) 25 %, Cantina 2.(Økonomi) 26 %, Cantina 3.(Stundentsamfunn) 14 %, Cantina 4.(TF) 17 % and Cantina 5.(Cafe Melker) 17 %. The distribution within the period was: Week 1 17 %, Week 2 66 % and Week 3 17 %. The distribution within the day was: Morning (9-11) 20 %, Noon (11-13) 58 %, Afternoon (13-18) 23 %.

Participants were 51% female and 49% male, with demographics that clearly reflected a Norwegian university campus; 90% students, 80% Norwegians and 73% under 30 years of age. In accordance with the experiment objective approximately half (51%) of the participants were pre informed about the arrangement of choices, while the other half (49%) was post informed. 67% chose a “healthy” snack from a green bowl, while 33% chose an “unhealthy” snack from red bowl.

The data was analyzed consolidated, and split in treatment groups (pre informed and post informed). To look for demographic differences, the results from experiment results were grouped in the following manner: *Age*: (1) under 40 years (2) 40+, *Occupation*; (1) employees (2) students, *Nationality*; (1) Non-Norwegians (2) Norwegians. A further data split was conducted to analyze possible demographic and choice based differences within the largest demographic group; Norwegian students, aged under 30 years.

RESULTS & DISCUSSION

PERCEPTIONS - MANIPULATION AND INFLUENCING

A strong majority of participants agree with statements related to manipulation and influence; 72% acknowledging that the experience made them more aware that their choices can be influenced and 76% experiencing that the placement of snacks was an action of manipulation. No differences appeared in pre and post informed groups for these two statements.

TABLE 1 PERCEPTIONS TOWARDS MANIPULATION OR INFLUENCE OF CHOICE

Reflecing on personal experience:	Agree Fully %	Agree Partly %	Disagree Partly %	Disagree Fully %	Don't Know %	Significance level	N
This experience makes me aware that my snack choices can be influenced.	28	44	15	9	4	n.s.	222
Placing the unhealthy snacks further from reach was an attempt to manipulate my choice.	33	43	11	8	5	n.s.	221
Promoting healthy food choices does justify manipulation of choices.*	32	29	19	9	12	>0,01	221
<i>pre informed</i>	32	33	19	2	15		
<i>post informed</i>	32	25	19	17	8		

* Recoded from "Promoting healthy food choices does not justify manipulation of choices".

n.s. = not significant difference
Significance level:
Pearsons's Chi-Square Exact Sig. (2-tailed).

Fewer participants (61%) agree that promotion of health food choices justifies manipulation of choices. Post informed are more likely to disagree than pre informed ($p < 0,01$). This indicates that revealing the motives and mechanisms of the intervention to a person after he or she has made a choice has a significant effect on the person's acceptance of the intervention, and may reduce support of such action in spite of having a health promoting motive.

These results indicate that participants in the experiment generally acknowledge that the experience made them aware that their choices can be influenced, and that interventions of this type, where healthier food choices are deliberately made more accessible are of manipulative nature. The fact that 4 of 10 participants are either against or unsure of the legitimacy of manipulation in spite of having a health promoting motives, and the significantly larger part of post informed participants disagreeing of such measures suggests that even benevolent motivated behavioral interventions need careful consideration to avoid being perceived manipula-

tive. This supports concerns on consumer welfare and consumer autonomy from hidden persuasion where choices are designed to increase the likelihood of a particular outcome. These can, even when designed with good intentions be experienced as manipulations that violate consumer perception of autonomy (Smith, Goldstein et al. 2013).

One can ask if it is possible that short term gains from design (choice architecture) that utilizes human fallacies known to designers of behavioral interventions, can possibly be nullified or even have a damaging long term effect, if the objects of change have a perception of manipulation, and thus not contribute to a sustainable behavioral change. A person knowledgeable of the motives for the given choice architecture wishing to exercise a “incorrect” choice (such as unhealthy food) as the correct one under the circumstances, to oppose perceived manipulation, while a person making a good choice (such as choosing healthy one) may go from a good experience to a bad one, when learning that the choice set has been tampered with.

This implies the sensitive nature of perceived manipulation within the realm of freedom of choice, underlining the importance of understanding the relationship of manipulation, autonomy and coercion. While coercive interventions directly interfere with the options provided to a person, manipulative choice design can provide all options in ways in ways that rational person would not make decisions, thus violating a person’s autonomy (Wilkinson 2012). Nudges may therefore not be liberty preserving just by maintaining or increasing freedom of choice, as they typically are used in contexts where individuals have difficulties to exercise free choice (Hansen and Jespersen 2013). Other perspectives that relate to manipulation, such as preferences and intentions need also to be taken into consideration. Designing nudges to fit someones preference structure can be difficult as preferences can be fragmented and shifting (Bovens 2008), based on bounded rationality, limited processing capacity, cognitive biases and environmental factors (Smith, Goldstein et al. 2013). Finally perceived manipulation from some kind of authority may be perceived as part of persuasion attempts, which can lead to reactance, or resistance, which can have a negative effect on attitudes when perceived as a threat to decision-making freedom (Pavey and Sparks 2009).

Hausman and Welch discuss Thaler and Sunstein’s fictive example of Carolyn the school cafeteria choice architect mentioned earlier. In Thaler and Sunstein’s own example, Carolyn can arrange food choices to make the students best off. (Thaler and Sunstein 2009, p.3.). According to Hausmann and Welch a choice architect that „pushes“ certain choices, in addition to or apart from rational persuasion – is diminishing a subjects autonomy. Such

action reflects the tactics of the choice architect rather than an evaluation of alternatives, thus taking advantage of flaws in human decision-making to choose one alternative over another (Hausman and Welch 2010). Discussing the issue of manipulation and ethics of nudging, Boven brands the example of Carolyn and the Cantina as a “paradigm case”, where the subjects are to be induced to choose a healthier diet. Boven defines the working of a nudge as the structuring of choices in such a way that some psychological mechanism leads people towards options that are either considered in their own best interest, or in the interest of society, where the benefits of the Cantina intervention apply both on the individual and societal level. The permissibility of nudges should be viewed in light of the following issues: To what extent they are aligned with our overall preferences; Their level of resilience, that is how well they would hold under non-nudge conditions; Their influence on a person’s capability to take responsibility of his life, that is the potential “infantilisation effect” of nudges; The risk of misuse of nudges due to lacking transparency, thus acting against the right of minorities. Boven acknowledges that unmasking the mechanisms at work may reduce the short term effect of the nudge, as “nudges work best in the dark”. In the Cantina case, increased transparency, like providing information of the rationale behind placement of food may reduce the short term effect of the interception, indicating the lack of long term effectiveness of nudges (Bovens 2008).

In light of the significant pre and post difference, and the high share of participants that are mistrustful towards manipulative interventions in spite of benevolent nature of the nudge it is important to carefully consider information provision both in terms of content and timing, when considering the long term effectiveness of nudges. The content allows individuals to align choice with preference structure, while timing of information provision can promote the perception of autonomy and respectfulness needed to avoid reactance and resistance.

PERCEPTIONS - KNOWLEDGE AND INFORMATION

Around half of participants (51%) agree that knowledge on the reasons for placement affected choice awareness (pre informed) or would have done so (post informed), and 45% agree that providing such information influenced their choice (pre informed), or would have done so (post informed). A much larger share (75%) agrees that knowledge on choice influencing is helpful to take better care of one’s health. This can be seen as a strong support to arguments for revealing of motives and mechanisms of nudges, coming as a response from persons that have just undergone this experience.

TABLE 2 PERCEPTIONS TOWARDS VALUE OF KNOWLEDGE AND INFORMATION

Reflecing on personal experience:	Agree Fully %	Agree Partly %	Disagree Partly %	Disagree Fully %	Don't Know %	Significance level	N
Knowing the reasons for the placement of snacks makes (could have made*) me more aware of my choice.	23	28	23	23	2	n.s.	222
Providing information about the snack placements (could have*) influenced my choice of snack.	14	31	27	23	5	n.s.	221
Knowing how choices can be influenced helps me take better care of my health.	27	48	16	4	5	>0,01	221
<i>pre informed</i>	22	60	9	3	6		
<i>post informed</i>	31	35	23	6	5		

*Different wording on questionnaire for Pre and (Post) informed.

n.s. = not significant difference
Significance level:
Pearsons's Chi-Square Exact Sig. (2-tailed).

The statements in this section were intended to look for differences in perceived value of knowledge and information between pre and post informed participants of the intervention. No significant difference appeared for the two first statements, but a significant difference appeared in the third, where post informing appears to have a polarizing effect; making people more likely to either fully agree or to disagree on the value of knowledge of how choices can be influenced ($p < 0,01$). The pre - post information difference was weaker than expected in light of the very explicit manipulative design of the experiment.

A possible explanation factor for almost half of participants disagreeing with the first two statements, while having a stronger agreement with the third can be that they view their current knowledge already as high, therefore disregard the value of being provided with this information when making a snack choice. This may be true for some, but can also indicate a subjective confidence (Kahnemann 2011, p.212.) in the ability to utilize such knowledge in real life situations, as information was made available, the consequences are not severe and there is now way to prove or disprove the respondents claim of knowledge. Keeping in mind that the experiment is done in a university population may intensify this effect.

Other influencing factors can be that many participants do not see their current state of behavior as biased, and may therefore not see self-protective value of intervention (Downs, Loewenstein et al. 2009), or not seeing the choices clearly as “healthy” or “unhealthy”, and the personal reflection may therefore not reveal clear differences between pre and post in-

formed participants. The fact that the experiment was conducted in a non-real environment may also bias these results, as an experiment could generate different results if repeated in a more real-life experimental setting (Skov, Lourenco et al. 2012).

The polarizing effects post informing has as opposed to pre informing demonstrates the highly contextualized relationship of information provision, experience and reflections, but may also indicate the value of allowing people to experience before reflecting in order to be able to generate a more correct picture of the relationship of experience and perceptions, and may be more aligned rational persuasion, as rational persuasion preserves autonomy and supports an individual's control over his or her deliberations (Hausman and Welch 2010). This indicates the a possibility to improve nudges by considering balancing timing of information provision, experience and reflection when designing nudges that support individual control.

This also draws the attention to the important to increase focus on *how and when and by whom* information is provided. In addition to information provision tools from social marketing (Kollmuss and Agyeman 2002) and other proved methods within public health, such as motivational interviewing, peer education which identify coherent causal pathways, when linking the intervention to the desired outcome (Bonell, McKee et al. 2011a)). This may be one of the fundamental weaknesses of nudge based strategies, as instead of addressing upstream socioeconomic determinants of health, such as poverty, neighborhood deprivation, and over-reliance on fossil fuels, they target downstream factors such as how individuals absorb information and perceive choices (Bonell, McKee et al. 2011b)). Viewing this in context to sustainability in food systems these learnings could be used to integrate nudges in more holistic behavior change strategies, using participatory methods and criterias for increased trustworthiness and professionalism (Pretty 1995). This would ultimately reduce the emphasis on intervening in behavior and increase the emphasis on inclusion to change behavior. This needs to be investigated empirically over time, as although manipulating choices (promoting healthy food options) through convenience has been shown to have a stronger immediate effect on meal choices than information (such as calorie information) the combination nudging and information need further research over time through longitudinal studies (Downs, Loewenstein et al. 2009).

ATTITUDE - HEALTH PROMOTING INTERVENTIONS

Table 3 displays the results for attitudes, where the statements are classified as directly affecting the choice (access, banning, taxation), affecting it indirectly (information, campaigns), or

having no intervention at all. Indirect interventions are strongly supported by participants with 94% agreeing on use of product information, 92% support use of image building campaigns (marketing), and 83% use of information on how choice can be influenced. The results for direct interventions are more varying with 88% in support of making unhealthy snack choices physically less accessible, 83% supporting taxation, and 40% agree in simply not allowing such snacks. 55% believe in allowing full personal freedom for such choice, which may appear as inconsistent if viewed as an option excluding all other interventions. The result indicates that participants did not necessarily make this distinction, suggesting this is viewed as a possible option depending also on other circumstances.

TABLE 3 ATTITUDES TO HEALTH PROMOTING INTERVENTIONS

Intervention type	People can be helped by:	Agree Fully %	Agree Partly %	Disagree Partly %	Disagree Fully %	Don't Know %	Significance level	N
Direct	- Making unhealthy snacks physically less accessible. (By placement).	45	43	7	4	1	>0,01	222
	<i>pre informed</i>	37	53	5	4	-		
	<i>post informed</i>	54	32	9	3	2		
	- Simply not allowing unhealthy snacks (Government regulation).	18	22	25	33	3	n.s.	221
	- Changing taxation to improve pricing of healthy snacks compared to unhealthy snacks.	47	36	9	7	2	n.s.	221
Indirect	- Providing information to increase awareness of how snack choice can be influenced.	41	42	11	1	5	n.s.	221
	- Running campaigns to build positive image around healthy snacking.	55	37	6	-	1	n.s.	222
	- Providing relevant product information that supports healthier snack choices.	60	34	3	-	3	n.s.	222
None	- Allowing each person to make snack choices according to their own preference.	20	35	27	5	14	>0,1	222
	<i>pre informed</i>	20	35	23	3	19		
	<i>post informed</i>	20	34	30	7	8		

n.s. = not significant difference
Significance level:
Pearson's Chi-Square Exact Sig. (2-tailed).

Significant attitude differences appear between pre and post informed participants for one of three of the direct interventions. Post informed are more likely to fully agree in making unhealthy choices less accessible, indicating that nudge based interventions that generally re-

ceive very strong support, receive even higher approval of such measures when participants are post informed of the motives and mechanisms of the behavioral intervention ($p < 0,01$). This insight may be valuable when considering education of nudge based interventions, by providing pre or post information on motives and mechanisms of the nudge when inquiring for attitudes. The significant attitude difference between pre and post informed towards no interventions may further support this consideration as post informed are more likely to disagree to allowing people to have full freedom of snack choices ($p < 0,1$). No significant pre - post information attitude differences appear towards indirect interventions.

The results for statements on attitude to health promoting interventions supports the recorded perceptions of a general believe in the value knowledge and information, as there is a strong agreement for use of product information and information on how choice can be influenced.

The strong support to indirect interventions seems also to be consistent to the high level of agreement to perceptions with more general effects from interventions observed discussion of the value of knowledge and information above.

EXPLORATIVE - DEMOGRAPHIC & CHOICE

Table 4 shows the main findings for demographic and choice related differences for statements on perceptions. It shows the clear nationality difference that appeared within post informed participants for all statements ($p < 0,01-0,1$).

TABLE 4 PERCEPTIONS - DEMOGRAPHIC DIFFERENCES

		All participants		Norwegian Students <30			
		Pre	Post	Pre		Post	
		Nationality	Nationality	Gender	Choice	Gender	Choice
Reflecting on personal experience:							
Perception: Influence / manipulation	This experience makes me aware that my snack choices can be influenced.	n.s.	>0,1	n.s.	n.s.	n.s.	n.s.
	Placing the unhealthy snacks further from reach was an attempt to manipulate my choice.	>0,1	>0,01	n.s.	n.s.	n.s.	n.s.
	Promoting healthy food choices does justify manipulation of choices.*	n.s.	>0,01	n.s.	n.s.	n.s.	n.s.
Perception: knowledge / information	Knowing the reasons for the placement of snacks makes (could have made**) me more aware of my choice.	n.s.	>0,05	n.s.	n.s.	n.s.	n.s.
	Providing information about the snack placements (could have**) influenced my choice of snack.	n.s.	>0,1	n.s.	n.s.	>0,05	n.s.
	Knowing how choices can be influenced helps me take better care of my health.	n.s.	>0,05	n.s.	n.s.	n.s.	n.s.

* Recoded from "Promoting healthy food choices does not justify manipulation of choices".

**Different wording on questionnaire for Pre and (Post) informed.

Numbers are Pearson's Chi-Square Exact Sig. (2-tailed).

"n.s." not significant difference

The reason for this difference may well partly be cultural, but as non-Norwegian participants come from many different nationalities it may also stem from other contexts, such as being a foreigner in Norway. As this could not be assessed in the results, a closer look was taken on demographic and choice difference within Norwegian students under 30 years of age, which is the largest demographic group in the experiment, and also the largest group of the student population at NMBU. This analysis showed no gender or choice difference within pre informed groups, and only in one statement on personal experience in post informed group; a gender difference within the post informed group when on the effect of providing information on placement of choices. This suggests weak demographic or choice related difference in responses to statements on perception towards manipulation or influencing of choices.

TABLE 5 ATTITUDES - DEMOGRAPHIC DIFFERENCES

	All participants		Norwegian Students <30			
	Pre	Post	Pre		Post	
	Nationality	Nationality	Gender	Choice	Gender	Choice
People can be helped by:						
- Making unhealthy snacks physically less accessible. (By placement).	>0,05	>0,01	n.s.	n.s.	n.s.	n.s.
- Providing relevant product information that supports healthier snack choices.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
- Simply not allowing unhealthy snacks (Government regulation).	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
- Changing taxation to improve pricing of healthy snacks compared to unhealthy snacks.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
- Providing information to increase awareness of how snack choice can be influenced.	n.s.	>0,1	n.s.	n.s.	n.s.	>0,01
- Running campaigns to build positive image around healthy snacking.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
- Allowing each person to make snack choices according to their own preference.	>0,05	n.s.	n.s.	n.s.	n.s.	n.s.

Numbers are Pearson's Chi-Square Exact Sig. (2-tailed).
 "n.s." not significant difference

In Table 5 the results from statements related to attitudes to health promoting interventions are analyzed for demographic and choice based differences. Nationality differences were less dominant, but appeared within both pre and post informed on the subject of making snacks less accessible. This difference also appeared within pre informed on allowing free snack choices to all, and within post informed on providing information on how choices can be influenced. No gender or choice differences appeared among pre informed Norwegian students under 30 years old, but appeared for one statement within post informed group. A choice based difference on providing information on how snack choices can be influenced ($p>0,01$).

EXPLORATIVE – TYPES OF EXPERIENCE AND REFLECTION

The last part of the research objectives was to look for other pre- post differences in the experiment results. In the experiment, participants reflected on perceptions and attitudes towards various types of experiences and effects of the experience. This created a possibility to look into possible pre – post information differences on matters of direct or indirect nature, and current or future nature. As time related discrepancies appear when people trade off costs and benefits that occur at different points in time, people tend make relatively far-sighted decisions when planning in advance if all costs and benefits occur in the future, but relatively short sighted decisions if some of these costs and benefits are immediate, which often is the case in financial as well as health and dietary decision making (Camerer and Loewenstein 2002). In complex decision making situations, consumers use a variety of heuristics to simplify the decision tasks (Tversky and Kahneman 1974), where series of behavioral maladies

that can deflect humans from acting in their own interests. This can include limited information, time and cognitive ability, discounting the future, (Laibson, Repetto et al. 1998, Thaler and Benartzi 2004), exhibit systematic cognitive error or preferring the default option (Thaler and Sunstein 2009), choice making flaws such as „projection biases“ and „nostalgic biases“ (Camerer 2006), „myopia“, „procrastination“, „optimism bias“, and „miswanting“ (Sunstein 2006). A part of the inconsistency may also emerge from being a food related situations, as instant gratification (such as snack consumption) can lead to timing inconsistencies and nativity in perceived self-control in future situations (O'Donoghue and Rabin 2000) .

To look for indications of time discounting discrepancies a distinction was made between two types of experiences for participators in the experiment. A classification was made between statements describing direct experiences and those of more indirect nature. A further classification was made on two types of reflections emerging from the experience; being either related to the current experience or towards more future related matters. More specifically the classifications are as follows:

Type of experience: Direct (D): Is the experience of the direct stimuli from the experiment, such as placement of choices, manipulative efforts, or being provided with information regarding the experiment being experienced. *Indirect (I):* Is the experience with consequences that may be affected by various factors (such as health), where the experience may have a more indirect effect.

Type of reflection: Current (C): Is a reflection directed towards issues that are direct part of the intervention, such as placement of choices, product information, banning of products. *Future (F):* Is a reflection directed towards issues more associated with the future, such as image campaigns, promoting healthy food, having better health.

In table 6 the statements on perceptions on manipulation, influence, knowledge and information are classified according to type of experience, whether they address the experience from the experiment, as direct (D) or indirect (I), and whether the reflections were directed towards current issues (C), or issues of future (F) nature. All the statements for perceptions are seen as experienced (E), while the types of reflections are more varying. Referring to the potential issue of time related discrepancies in food related situations, it is interesting to observe the significant pre - post information differences did not appear in the current (C) reflections, while they did in both of the future (F) statements ($p < 0,01$).

TABLE 6 PERCEPTIONS - EXPERIENCE AND REFLECTIONS BASED PRE - POST DIFFERENCES

Type of experience	Type of reflection	Reflecting on personal experience:	Significance level	N
D	C	This experience < - > Awareness of choice influence.	n.s.	222
D	C	Snack placement < - > Attempt to manipulate choice.	n.s.	221
D	C	Knowledge of reasons of snack placement < - > Increased choice awareness.*	n.s.	222
D	C	Information on reasons for snack placement < - > Influencing choice. *	n.s.	221
D	F	Promoting healthy food < - > Manipulation of choice.	> 0,01	221
D	F	Knowledge on how choices can be influenced < - > Help to better health.	> 0,01	221

n.s. = not significant difference
 Pearson's's Chi-Square Exact Sig. (2-tailed).

This difference can indicate a varying pre- post effect of information provision regarding motives and mechanisms of behavioral interventions on perceptions when experiencing directly and reflecting towards future related matters. This may relate to the matter of time discounting discussed above, possibly reducing time discounting discrepancies between perceptions of direct or current implications vs those of indirect or future implication. Here this difference seems to appear with participants giving different discounts on perceptions towards a manipulative health related intervention depending on the time when they are exposed to information about the intervention.

In table 7, statements on attitudes to behavioral interventions are classified in a similar way as was done for perceptions previously in table 6. Here, types of experiences vary, as some statements probe after attitudes that are not directly related to the experience. Significant pre-post information differences appear in two of three statements related to direct experiences (D) with reflections related to the current (C) experience. No such difference appears when the experience is indirect. These results could indicate that timing of information about the behavioral intervention is more likely to have an effect on attitudes towards interventions when

based on own experience, than attitudes which are indirectly related to the experience, even though the issues are highly relevant (such as taxation in this case).

TABLE 7 ATTITUDES - EXPERIENCE AND REFLECTION BASED PRE - POST DIFFERENCES

Type of experience	Type of reflection	Reflecing on personal experience:	Significance level	N
D	C	- Making unhealthy snacks less accessible (placement)	> 0,01	222
D	C	- Allowing own preference.	> 0,1	221
D	C	- Providing information on choice influencing.	n.s.	222
I	C	- Banning unhealthy snacks.	n.s.	221
I	C	- Changing taxation	n.s.	221
I	C	- Product information	n.s.	222
I	F	- Image campaigns	n.s.	222

n.s. = not significant difference
 Pearsons's Chi-Square Exact Sig. (2-tailed).

Looking at the results for perceptions and attitudes together, table 8 shows that results are not similar in terms of pre – post information differences. Statements measuring direct experiences (D) and current (C) reflections show different results depending on whether they are perceptions, and thus more directed to one’s own interest, or attitudes viewed as more general perspective (for all). This is turned around for direct (D) experiences with future (F) reflections for perceptions. Unfortunately the experiment does not measure this for attitudes making such comparison impossible. Similarly, the experiment does not allow looking for differences between perceptions and attitudes for indirect experiences (I) and current (C) or future (F) reflections. This may however be addressed with further research to investigate these relationships.

TABLE 8 PERCEPTIONS AND ATTITUDES - SIGNIFICANT PRE - POST DIFFERENCES

Experience	Reflection	Perception: (For One Self)	Attitude: (For All).
D	C	n.s.	Significant pre/post information differences.
D	F	Significant pre/post information differences.	Not tested.
I	C	Not tested.	n.s.
I	F	Not tested.	n.s.

n.s. = not significant difference

The differences displayed in table 8 may partly be explained in the previous discussion on various biases and errors, which can lead to overestimating one’s own knowledge and self-controlling abilities when comparing to others. This may be supported by viewing absolute results for the statements regarding information on how choices can be influenced. The value of this information differs when perceived as a perception (table 2: 45% agree that providing such information has influence on one’s choice) and an attitude (table 3: 83% supporting use of such measure to help (other) people). This also may indicate how framing of choices can affect answers (Read, Loewenstein et al. 1999), and potentially project a narrative fallacy (Kahnemann 2011, p.199.), as the experiment offers a simplified range of choices which provides the possibility for participants to give a generalized picture of what strategies may be of how people could best be helped to take care of their own health. A simplified narrative is constructed from fixed choices failing to explain an extremely complex reality, as no space is given for participants to flesh out their more detailed thoughts on the matters of discussion.

The findings discussed in this section have clear weaknesses, as they are not a part of the research objectives and the experiment has therefore not been designed accordingly. Therefore this section should primarily be viewed for the purpose of considering possible further research into the relationships identified in the above discussion.

CONCLUSION:

This experiment has investigated whether timing of information regarding food choice design with intervening motives (choice architecture) affects certain perceptions or attitudes towards important factors of food related behavioral interventions, including manipulation, information and knowledge. The experiment did not give as clear pre – post information differences as expected, but gave some indications that may be of value for further investigation.

In addition to revealing a general concern towards manipulation, being post informed about manipulative choice design appears to negatively affect support towards benevolent use such as health promoting, compared to being pre informed. This indicates the importance of careful consideration of information provision both in terms of content and timing, when considering the long term effectiveness of nudges.

Although affected by experimental settings and behavioral biases the value of knowledge and information regarding influencing of choices appears clearly in results. The polarizing effect of post information compared to pre information demonstrates the highly contextualized relationship of information provision, experience and perceptions, which may be used to improve nudges by using timing of information provision to support rational persuasion. Generally supportive attitude and increased post information support towards nudge based interventions gives indication of the educational value of using timing in information provision to demonstrate value of nudge based behavioral interventions. Timing of information appears to affect a) perceptions when people reflect on future implications from a direct experience, and b) attitudes when people reflect on current implications from direct experience. Although this observation is not strongly supported in the methods of the experiment, this may be a topic for further investigation, as it may shed light on matters of importance, such as time related discounting, inspiring further interest for further work regarding the issues of manipulation, influence, knowledge and information in nudge based behavioral interventions.

In a paradoxical world of overwhelming choice, where on one hand economic growth is of paramount importance, and the other there is need for action to save the planet over exploitation it is worthwhile to seek ways to include more of Aristotle's phronimos (prudential wisdom) in nudge based choice design, to give individuals the possibility to know when to stop.

Instead of „outsourcing“ choice design to „nudge specialists“ more attention may be given to developing ways to actively inform and involve objects of change in the design of solution

that increase knowledge and understanding of the fallacies and biases affecting human behaviour, ultimately leading to long standing behavioral change, in this case a more healthy and/or more sustainable food consumption behaviour. Sheltering people from undesired experiences due to “current – future” inconsistencies, by implementing nudge-based choice design may lead to less error and less understanding, which may not be a desirable development. Increased focus on *how and when and by whom* information is provided can integrate nudges in more holistic behavior change strategies, using participatory methods and criterias for reduced emphasis on intervening in behavior and increase the emphasis on inclusion to change behavior, where the object of behavioral change is treated as an active *and informed* participant in shaping his or her future.

Returning to Carolyn the choice architect, a relevant suggestion for her may be to widen the scope of her task to encompass participation of teachers, students, parents and other relevant stakeholders in the task of combining design of healthy choices with studies and activities of the food and farming system, thus bringing about a more sustainable choice architecture and thus contributing to more a more sustainable food system.

APPENDIXES:

A: QUESTIONNAIRE EXAMPLE

Part 0:

A

This is a survey conducted as a part of a Master Thesis by a student in Agroecology at The Norwegian University of Life Science.
Thank you for participating !

Survey Information

IMPORTANT: Please read the following paragraph before answering the survey, and check in box to confirm.

You are about to participate in a simple experimental survey. You will be offered a choice between a healthy snack (Green bowl, marked #1) and a less healthy snack (Red bowl, marked #2). The snacks were deliberately positioned in such way to promote the healthier option. This is done by selecting a green color for the bowl, and placing it easily reachable. The unhealthier snack option is placed in a red bowl and further from reach. You are free to choose which ever snack you desire, but the choice is limited to only one snack. Please answer the rest of the questionnaire after you have selected your snack, and return it to the survey conductor.

Please check the box if you have read the above information.

Snack Selection

Please check the right box to confirm your snack selection.

- #1 Green Bowl (Healthy Snack)
- #2 Red Bowl (Unhealthy Snack)

Please continue to the next page

Part 1-2:

Snack Selection - Choice

PART 1:

Please choose your level of agreement or disagreement with the

I selected my snack primarily because:

1.1	- It was the most appealing option.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	- It was the most convenient option (close to hand).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	- It was the most healthy option.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	- It was mostly due to the circumstances (not a real life situation).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	- It was the most environmentally responsible thing to do.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	- It was an impulse choice.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Snack Selection - Placement & Colors

PART 2:

Please choose your level of agreement or disagreement with the

Contemplating my experience I find the following applies for me:

2.1	This experience makes me aware that my snack choices can be influenced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Knowing the reasons for the placement of snacks made me more aware of my choice.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Placing the healthier snack closer to reach influenced my choice of snack.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	Providing information about the snack placements influenced my choice of snack.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	Placing the unhealthy snacks further from reach was an attempt to manipulate my choice.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.6	Promoting healthy food choices does not justify manipulation of choices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.7	Knowing how choices can be influenced might help me take better care of my health.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.8	Use of colors can help me make a healthier choice of snack.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.9	I associate the color red with unhealthy snack choices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please continue to the next page

Please continue to the next page

Part 3-4:

PART 3: Snack Selection - Availability

Please choose your level of agreement or disagreement with the statements

People can be helped to make healthier snack choices by:

	Agree fully	Agree partly	Disagree partly	Disagree fully	Don't know
3.1 - Making unhealthy snacks physically less accessible. (By placement).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2 - Providing relevant product information that supports healthier snack choices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3 - Simply not allowing unhealthy snacks (Government regulation).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4 - Changing taxation to improve pricing of healthy snacks compared to unhealthy snacks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5 - Providing information to increase awareness of how snack choice can be influenced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6 - Running campaigns to build positive image around healthy snacking.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.7 - Allowing each person to make snack choices according to their own preference.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART 4: Demography

4.1 Gender	<input type="checkbox"/> Woman	<input type="checkbox"/> Man	
4.2 Occupation	<input type="checkbox"/> Student <input type="checkbox"/> Employee <input type="checkbox"/> Other	Faculty <input type="checkbox"/> Environmental Science and Technology <input type="checkbox"/> Veterinary Medicine and Biosciences <input type="checkbox"/> Social Sciences	Institution <input type="checkbox"/> IMT, IMV, INA <input type="checkbox"/> IBA, IHA, IKBM, IMI, IPV, IPDM, ISF <input type="checkbox"/> Handelshøyskolen, NOR-AGRIC, LLP
4.3 Nationality	<input type="checkbox"/> Norway <input type="checkbox"/> Africa <input type="checkbox"/> Asia <input type="checkbox"/> Europe <input type="checkbox"/> N-America <input type="checkbox"/> S-America <input type="checkbox"/> Oceania		
4.4 Age	<input type="checkbox"/> <23 <input type="checkbox"/> 23-29 <input type="checkbox"/> 30-39 <input type="checkbox"/> 40-49 <input type="checkbox"/> 50-59 <input type="checkbox"/> 60+		

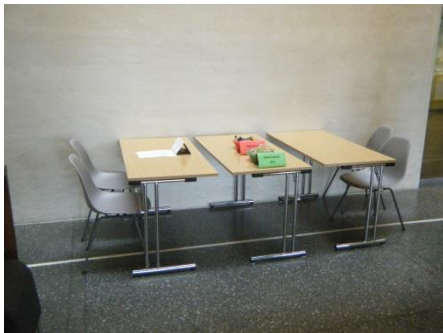
B: PICTURES FROM EXPERIMENT



Økonomi Cantina



TF Cantina



Sørhellinga Cantina



Tårn Cantina



Snack Choices

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REFLECTIONS

Blaise Pascal famously ended a letter with this apology: *“I’m sorry that this was such a long letter, but I didn’t have time to write you a short one”*. I feel that I have gained better understanding of these words after the experience of writing this thesis.

From the days in early January 2013, when the grandiose idea emerged; Writing a thesis that would *“reconnect consumers by linking together agro-ecology to behavioral economics”*, I have come to understand that being a self-assigned marriage counselor or midwife for such a merging is tall order to say the least.

The assignment appeared pretty straight forward; coming up with an idea, doing basic research, formulating a research question, and then going loose on the keyboard with thesis writing. But this proved to be a much more overwhelming, time consuming and energy draining task than I could have imagined, as I realized that this academic writing wasn’t going to be the easy work I had assumed.

This misconception is probably to a certain extent embedded in my character as a spontaneous and creative person, but less seasoned in the practice of deeper reflection. Other contributing factors may be hardcoded in habits and thinking patterns that stem from my life experience as an operational “non-academic” marketing practitioner.

In spite of these traits, I slowly (yes, very slowly), edged my way through a rising pile of articles on behavioral science, psychology, economics, public health, philosophy, political science and articles directly discussing concepts of behavioral economics, nudging and choice architecture. During this process I also realized that I needed to view and review literature from disciplines known to me (at least to a certain extent) within marketing research and consumer research.

The initial plan was to submit the paper within 2013, but for many reasons of private nature I postponed this, and rescheduled the submission for summer 2014.

After starting serious reading in early 2014, a search for “my take” became a haunting topic. At the time my attention was consumed by many exciting behavioral economics inspired experiments which typically would aim at revealing erroneous behavior due to limitations and conflicts in the human being. It was fascinating and insightful to see how simple errors and biases in human nature could compound to overwhelming problems, such as debt and over-

weight. But it when reading the literature I got the feeling that when the discussion turned to prescribed solutions to these ailments, they generally indicated the involvement of 3rd party design of choice environment to shield the person from the consequences of a bad decision.

I intuitively sensed that “my take” would somehow challenge this problem-solution relationship, and the idea to implement a “typical behavioral economics experiment” that would encounter this issue was born. I realized that some of the knowledge made available to me through the Agroecology studies would be beneficial, bringing more attention to empowering the individuals or communities (the object or objects) as active elements in the solution, instead of being passive recipients of choice architecture designed by nudge-specialists.

Now I just needed to develop a story to argument for this experiment.

After a while I had a solid title: *“SUSTAINABLE “NUDGES” - DEVELOPING PARTICIPATORY “NUDGE” BASED CHOICE ARCHITECTURE TO REDUCE RISK OF PERCEIVED MANIPULATION IN FOOD RELATED BEHAVIORAL INTERVENTIONS*, and an introduction skeleton that consisted of the following parts: 1) Human Behavior, 2) Behavioral Science, 3) Consumer Behavior, 4) Behavioral Economics, 5) Policy: Libertarian Paternalism (a fancy name for nudging). And now I needed somehow to tie Agroecological aspects in such Sustainable food and farming systems, Action Research, Participatory processes into story to close the loop. Although the “main document” increased in size, the boundaries and purpose became more and more unclear as various “interesting and possibly relevant subjects” continued to pile in. The over 200 research papers and other references included into Endnote shows the ambition level, but they represent the unclear nature of the work rather than a result of accumulated knowledge.

As a consequence the content was quite loose and scattered, and it was difficult to see a “red thread” that would crystalize in a research question, but heck! - this was all very, very interesting.

By the middle February I needed to cut through and start designing the experiment. So, decisions needed to be made, the experiment needed to be designed, and consequently a questionnaire needed to be made. I decided to target food, and more specifically snacks, as ample evidence prove the weaknesses of humans when confronted with palatable pleasures. Doing a food choice experiment in the NMBU University canteens would be a perfect approach in terms of facilities and a population to examine. This did however require planning, communication and timing of experiment with Easter, spring exams and summer vacations as con-

straining factors. So with time constraints pressing the experiment was designed (see chapter on methodology), which later proved to work quite well in implementation.

The strategy was simply to use the same means used by behavioral economists to demonstrate importance of informing subjects of behavioral change by manipulating timing of information, as received either before or after participating in the experiment, where one should choose a healthy or unhealthy snack. The snack choice itself was not of importance, but instead the key idea was to link timing of information (before or after snack choices) to reflection. To keep this simple, I decided on providing standardized information regarding the choice environment (the motives and mechanisms of the nudge based design) to the participants at different points in time to see the effects this would have on their perceptions and attitudes to various matters related to the research objectives, which were not fully clear at this point in time. Consequently, the design process of the questionnaire became somewhat unfocused and the questions ending up on the questionnaire were therefore not thoroughly tested.

The whole process seemed simple enough, but in hindsight there were many issues that I would have liked to address more thoroughly:

1. Existing knowledge: Limited attempt was made to find empirical evidence that might support the claim and somehow connect the experiment to this research, by confirming findings and possibly adding to them.
2. Objectives of questions (Statements) and Research objectives: although the questions were discussed and tested they did not have well established goals, neither independently, or in relation to one another. The link to the research objectives and research questions was weak due to reasons explained above.
3. Statistical knowledge: To little effort was made to quality control the questions from a statistical analysis perspective. Various tests of individual questions, such as factor analysis, relationships of questions and the questionnaire design would have made the experiment more targeted and lead to a clearer process of analyzing results. As this was not done properly the analysis partly became a search for “something that made sense”. It also limited my confidence to go into deeper statistical analysis of the data.
4. Qualitative responses: Having open questions or an open text field for comments and additional input would have improved the quality of the survey, and given additional insights that could not be read from the fixed questionnaire.

The above weaknesses lead to a prevailing reluctance to handle the data from the experiment as statistical material. I instead chose to observe it more descriptively and only do explorative analysis on the differences between the pre and post informed treatment groups.

This also brought fresh vigor to my desire to write about the connections of the various fields related to the chapter headings listed above. But the scope of the work was elusive and after a while I sat with a bunch of pages describing the various topics somehow connecting to these themes, but instead of forming a smooth red thread through the work, it had become a web of various tangled and twisted strings in different colors, texture and thickness.

I came to a realization that these chapters reflected my learning process as some kind of a dossier on the subjects rather than being a discussion leading to a research question, and onwards to the experiment. This was a very frustrating realization, as I needed to rethink the texts from scratch, and large parts of my writing were wasted.

The unclear results from the experiment (yes, also related to unclear objectives) made this task difficult, so I struggled trying to find articles that could be discussed in relation with the results. But eventually I managed to construct themes which also lead to revised research questions, and finally to a much simpler and crisp document, where the themes discussed in the 5+ chapters were now contained in two chapters, the Introduction and Results & Discussions.

Another sidestep I thought could make up for the weaknesses of the experiment was a miniature version of discourse analysis, I chose to call “topic analysis”, where the motive was to display which themes or topics were most dominant in the discourse of “nudging” and “choice architecture”, which were the buzzwords at the time. This search gave indications of a higher representation of words describing consequences, prescriptions to consequences or externally originated topics, such as policy environment, intervention, inform, obesity, design, regulate were more visible than words describing action of the agent (the individual), such as responsibility, empowerment, knowledge, involvement, participation. Although these were interesting findings, they did not directly link to “my take” and this chapter ended up being dropped.

On a constructive note, I need however to remind myself that during this time I was also trying to develop a picture of the various dimensions being studied within new research areas unknown with unclear boundaries. Starting with the discourse of behavioral economics, it is a

very broad discourse, from small food experiments such as the one I wished to imitate, up to ethical discussions on autonomy and coercion and political discussion on libertarian paternalism. This also links back to the smallest elements of everyday human behavior, such as when I exercise optimism bias as my irrational self tells me to stuff some articles into my backpack before going home for the weekend, in clear conflict with my rational self that knows from empirical evidence that these articles stay firmly put in the backpack and only add to the carrying weight on the distance back and forth from the office desk and home.

Reflecting on this journey there are many realizations that have been valuable for personal growth. I think that the single most important thing I have learned about myself is the need to avoid the temptation to embark on large scale missions to seek unifying truths. I have caught a glimpse of the existence of a wide range of extremely complicated topics with unclear causal links which govern everyday lives of individuals, families, communities and societies. The awareness of this complexity and the need for critical thought may be more important than wielding the solutions to address every single bias and error. Bringing these themes to the attention to normal people in respectful, interesting and empowering ways is something I would love to work with in the future.

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