

Msc T H E S I S

Commitment and pro-environmental behaviour. Why and how is commitment effective? Self-concept and preference for consistency mediating the commitment effect.

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Abstract

Earlier work has shown that the making of commitments is an effective way of changing people's environmental behaviours. The current study adds to these studies by investigating the underlying process.. The main research questions are whether a change in self-concept mediates the effect of commitment on behaviour, and whether this moderated by preference for consistency.. It was hypothesized that making a commitment changes people's self-concept, and that they then would be motivated to behave accordingly. Also I hypothesised that these effects would be stronger for people with a high need for consistency. Unfortunately, the data did not support these hypotheses. There was no main effect of commitment on behaviour, therefore mediation could not be tested. I reflected on results and provided recommendations for future research with ideas of improving the manipulation.

Keywords: commitment, self-concept, preference for consistency, environmental behaviour, pro-environmental intentions, environmental concern, mediation

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List of abbreviations

| | |
|------|------------------------------|
| C | Contribution |
| EC | Environmental concern |
| FITD | Foot in the door technique |
| PEI | Pro-environmental intentions |
| PFC | Preference for consistency |
| SC | Self-concept |

Introduction

Background

Nowadays varieties of environmental problems arise and deepen fast. There is a substantial growth in production and consumption of unsustainable nature. As a World Wildlife Fund report from 2006 states:

The Earth's regenerative capacity can no longer keep up with demand. (...) This growing pressure on ecosystems is causing habitat destruction, or degradation, and permanent loss of productivity, threatening both biodiversity and human well-being. (Global Footprint Network, 2006)

There is a significant increase in production and consumption in recent years. Along with that there is a growing complexity and build-up of consumer needs, wants, desires and wishes. This has led to depletion of resources, even though awareness of the impact of this problem exists (Smart, 2010). Ecological harms call for major concerns all over the world. A study by Diekmann and Franzen (1999) showed that people from both rich and poor nations rate ecological problems significantly high among other problems. Moreover, the notion that simply economic growth is far from being the single answer to all ecological problems, has been strongly emphasized (The World's Bank's World Development Report 1992, IBRD, 1992). Instead, the focus has been shifted on policies and actions to become of main importance in protecting the environment. Ecological degradation covers practically all aspects of life with pressing importance and there is need for those issues to be taken care of and tackled on different levels as well as with a wide range of both proven and innovative prospective techniques, interventions and actions in general.

It has come to a point where environmental sustainability in recent years is seen more as an issue of the human society (e.g. Bechtel & Churchman, 2002; Bonnes & Bonaiuto, 2002; Gardner & Stern, 2002; Kaufmann-Hayoz, 2006; Redclift & Woodgate, 1997; Schmuck & Schulz, 2002; Stern, 2000; Vlek, 2000; Winter & Koger, 2004). That is why the promotion of behavioural change has a central role in managing environmental problems. Working towards the cultivation of environmentally responsible behaviour is widely perceived in the last decade to be key in addressing and dealing with environmental issues (Winter and Koger, 2004; Gardner and Stern, 2002; Vlek and Steg, 2007).

With the goal to better understand and alter human behaviour with regard to the environment, environmental behaviours have been widely studied from different theoretical perspectives. Understanding the determinants of environmental behaviour, as well as in general grasping the concept and aspects of it, serves the purpose of creating effective interventions towards environmentally responsible behaviour. Interventions towards pro-environmental behaviour need to be designed, ones that will trigger as effective as possible long term positive changes in individual behaviour that benefit the environment and with that the long term well-being of individuals, groups and the society as whole.

Commitment strategies present such option for intervention and will be a reference point of this current paper. They have been an active interest of studies for the past 30 years and throughout time they have been proven effective both alone and in combination with other interventions. When it comes to commitment in relation to environmentally responsible behaviour alone, there have been a considerable number of studies conducted and in the very recent years, a meta-analysis done by Lokhorst, Werner, Staats, van Dijk and Gale (2013) brought attention to the power of this strategy. They concluded that when people make a commitment to change an environmental behaviour, they are very likely to hold on to those

commitments. However, less is known about how commitment exactly works. The authors have proposed as possible mediators in this relationship certain underlying psychological processes, namely: (1) self-concept and ones' need for consistency, (2) attitudes and (3) personal and social norms, suggesting that they all work separately, as well as together to explain the relationship between commitment making and change of environmental behaviour.

Research objective

In the current study I will empirically investigate whether self-concept and the need for consistency indeed mediate the effect of commitment making on behaviour.. With the research objective set, the following section aims to provide the reader with review of relevant literature on the topic of concern, to provide information about relevant findings connected with the objective of this study and to lay a theoretical foundation for the further stages of the current research.

Literature review

Pro-environmental behaviour

Since around the 1960s, in look for innovative solutions to the problem with ecological degradation, the field of environmental psychology started to develop. The emphasis was on the interaction between the human and the environment. The ecological degradations and the psychological roots of it emerged as major topic of concern in the field, alongside barriers to pro-environmental behaviour. The notion of pro-environmental behaviour expresses, as defined by Kolmuss and Agyman (2002), ‘behaviour that consciously seeks to minimize negative impact of one’s actions on the natural and build world (e.g. minimize resource and energy consumption, use of non-toxic substances, reduce waste production, etc.)’. Many researchers have been focused on the effectiveness of the variety of tools for behaviour change (see Abrahamse et al., 2005; Lehman and Geller, 2005; Steg and Vlek, 2008) One of the proposed tools is commitment making. Further information of the nature of it follows as I look into it as a predictor of behaviour and trigger of self-perception changes along the way.

Commitment

Overview of the term

The term commitment has several meanings in the English language, probably the most relevant to the topic of concern here is the one defined by dictionary as ‘act of pledging or engaging; the act of exposing, endangering, or compromising; also, the state of being pledged or engaged’ (Webster's Revised Unabridged Dictionary, 1913). In his article ‘Notes on the concept of commitment making’(1960), sociologist Howard Becker points out that ‘the term has been made to cover a wide range of common-sense meanings, with predictable ambiguities’ and he tries to analyse it more in depth. He suggest that dealing with the term,

one must consider the following: (1) its connection with engaging in *consistent lines of activity*; (2) that it is realised through making a *side bet* (the act of linking other interest to the original action); (3) sometimes side bets result in limiting a future activity; (4) some commitments are made consciously and other are not being realized full at the moment; (5) commitments are strongly related to values, in terms of trade-offs for the bet in interest; (6) often commitments that people make are indeed contradictory. In conclusion he talks about commitment in association with terms such as ‘involvement’, ‘attachment’, ‘obligation’, ‘vocation’. This early and basic capture of the image of commitment provides basics for the understanding of the term.

Further Becker’s analysis is important for our study, first because it emphasises on its dual character – expressing both a state: ‘being committed’ and an action: ‘making a commitment’. The latter shows its dynamic side and as such has the potential to be manipulated in order to trigger further desired action. Particularly in our study we are looking for change in environmental behaviour into more responsible one. The second aspect of Becker’s investigation that is important for our study is the way he looks at it as a mechanism to explain the phenomenon of consistency in behaviour. As pointed before he associates commitment with the notion of consistent lines of activity. This phenomenon of consistency will be later more detailed explained in this paper as it takes central part in our research. To deepen our understanding of commitment in the current context, next I will look into the concept of public commitment and its use in strategies and interventions. In this current study I attempt to look at commitment as a tool to shape and steer behaviour through its influence on person’s self-perception or also known as self-concept. Before I go deeper into the later theory, I would like to present an overview of commitment making and its place among other

interventions as well as to illustrate successful attempts to implement this tool in inducing pro-environmental behaviours.

Commitment – place among other interventions

As established earlier, many different interventions exist and are being developed that aim change in behaviour and each works in specific way and through different channels.

Various distinctions between types of interventions exist. A popular one classifies them into structural strategies and informational strategies (Messick and Brewer, 1983). Both types have proven their effectiveness in different conditions. They are being used both alone and in combination, depending on the specific aim and the type of environmental behaviour that is in focus. Structural strategies intend change in the underlying circumstances under which choices of behaviour are made. They aim to reward ‘good’ behaviour, or penalize ‘bad’ behaviour. The main tools here are legal regulations and financial incentives. Informational strategies on the other hand aim at change in perceptions, motivations, cognitions and norms (Messick and Brewer, 1983). They present an area with growing importance. That area concerns all possible interventions that include voluntary change of environmental behaviour. Informational strategies incorporate actions such as (among others) information campaigns, eliciting implementation intentions, individualised social marketing approaches, actions that use social support and role models, participation approaches and last but not least commitment strategies (Vlek and Steg, 2009).

This being said, commitment strategies present a relatively dynamic and prospective area of intervention techniques. They aim at change in behaviour that occurs ‘without changing the external context in which choices are made’ (Vlek & Steg, 2009). Moreover the idea is to make individuals actively attracted to that change. (Dolnicar & Grun, 2009).

Public commitment and the environment

Since long time already the notion of commitment has been adopted by psychologists and experts in respective areas in search for its implementation for behaviour change and to explain aspects of behaviour in general. Considerable attention has been put on public commitment per se. Early studies on it can be traced back to such of Kieser and Cobin (1965), Kieser, Zanna, and Desavo (1966), Kieser, Roth, and Pallak (1974), Cialdini, Cacioppo, Bassett and Miller (1978). Hollenbeck, Williams and Klein (1989) state that the more publicly people express their attitude and behaviour intentions, the more they are committed and stable in their position and their further actions. Same was proven in a study by Gopinath and Nyer (2009). Cialdini and Trost (1998) point that public commitments have stronger effect than those made in private. Public commitment has been proven to have variety of implications in different areas. Commitment techniques, in which people voluntarily and openly agree on a specific action, have the potential to be successfully applied in altering wide range of behaviour types, among which sustainable behaviour.

Typically research on commitment involves assessment of particular attitude, self-concept, behaviour or intention of behaviour, followed by a subtle convincing of people to voluntarily sign a petition, pledge or any other decided upon form of public declaration of commitment, that supports a target issue position, and then followed by another assessment of the self-concept, the relevant attitudes or behaviours. The work of Katzev and Pardini (1988) showed that residents who did commit were significantly more likely to engage in the behaviour both during the intervention and the follow-up period, compared to token reinforcement and information only control groups. A study by Gonzales, Aronson and Costanzo (1988) used verbal commitment from householders. Researchers used arranged

points of contact to obtain commitment. That increased the cases when people did retrofit¹ their homes, which was the aim. Lokhorst, van Dijk, J, van Dijk, E, Staats and de Snoo (2010) conducted a study among farmers in Netherlands, in which farmers who voluntarily made a public commitment to get involved with nature conservation, were considerably more likely to change their behaviour accordingly. A study on promoting bus ridership by Bachman and Katzev (1982) put participants in four conditions – ‘information only’ (they were given route and schedule information), ‘commitment condition’ (they verbally pledged for a month to ride the bus twice per week), ‘incentive condition’ (they were given ten free tickets) and ‘combined condition’ (both pledge and free tickets). Results showed an increase in bus rides among participants in all of the last three conditions and that was valid not only for the treatment period, but also observed via two follow-up periods. Wang and Katzev study on recycling (1990) also proved that commitment techniques have the power to sustain behaviour after the intervention period.

Those and many other studies account for the success of commitment techniques in modifying behaviour. Moreover they put a focus on the need to analyse further and deeper how exactly does that happen, in order to be able to increase their effectiveness, by creating programs and campaigns that are better tailored to communicate exactly and efficiently.

Commitment – how does it work

Cialdini (1985) argued that commitment functions in three ways. First puts commitment in line with the so called ‘automatic consistency’: ‘Once a stand is taken, there is a natural tendency to behave in ways that are stubbornly consistent with the stand’ (p.68). The second way is connected with the idea of the self-concept and to what degree an individual feels responsible and in charge for their own behaviour. Third, he speculates that

¹ Retrofitting refers the addition of new technology or features to older systems, in this case such that is beneficial for the environment

people are very likely to look for and even create new beliefs to support their self-image; they change in order to have attitudes, actions and self-concept consistent.

In his more recent work from 2001, he elaborates even further the topic of commitment. He stresses out that what all successful commitment strategies have in common is that they set in motion essential changes within the individual. He brings attention to the process of altering of one's self-concept which includes change of cognition, values and attitudes that represent internalized transformations that facilitate more stable and long term change of the desired behaviour.

The overview of some relevant studies on commitment and environmental change, made earlier in this paper, gives some insight into how public commitment manipulation functions. There is a substantial amount of literature linking commitment to shifts in attitudes. Further Pallak et al. (1980) point out that commitment makes one's beliefs more salient, and that can make them more accessible and more likely to be taken into account when the time to act comes. Halverson and Pallak (1978) believed that commitment manipulation leads to issue involvement, which in turn leads to increased motivation to process a persuasive communication that may follow the commitment as part of the strategy. Commitment effectiveness has been also associated with fear of social disapproval (Wang and Katzev, 1990). Social and personal norms in general have been also speculated to have a role in the effectiveness of commitment making (Abrahamse, Steg, Vlek & Rothengatter, 2005; Kerr, Garst, Lewandoski and Harris, 1997, Lokhorst et al., 2013).

As illustrated above, the commitment making as a mechanism - part of the behavioural interventions, has been proven effective. Lately it has been perceived as more and more promising intervention technique (Abrahamse et al. 2005; De Young 1993; Dwyer

et al. 1993; Lockhorst 2010; Katzev and Wang 1994,) . Therefore I hypothesize effects of commitment in the current research regarding this tool. Related research hypothesis can be stated as follows:

H1: Commitment making will lead to:

H1a: A positive change in pro-environmental behaviour

H1b: A significant positive change in pro-environmental intention.

H1c: A significant positive change in environmental concern.

The way commitments work, in large part, is due to a process that Daryl Bem (1972) calls self-perception, also known as self-concept. According to it individuals come to see themselves as the type of person who believes it is important to follow certain way of behaviour. Franken (1994) refers to the importance of one's self-concept:

"There is a great deal of research which shows that the self-concept is, perhaps, the basis for all motivated behavior. It is the self-concept that gives rise to possible selves, and it is possible selves that create the motivation for behavior" (p. 443).

This leads to the hypothesis that:

H2: Commitment making will lead to a change in the environmental self-concept.

Further attention will be given to this process with the aim of better understanding of it functioning alone and in the context of commitment and behaviour.

Self-concept

Overview of the term

The self-concept is a construct capturing the individual's perception of themselves in relation to different characteristics, personality traits, behavioural patterns and such. It is

often referred to self-identity, self-perception and self-construction, and is based on self-perception theory (Bem, 1972), which states that people often define and regulate their own attitude by observing their own behaviour and according to the circumstances in which this behaviour is taking place.

Baumeister (1999) defines *self-concept* as: "the individual's belief about himself or herself, including the person's attributes and who and what the self is". Rogers (1959) believes that the self-concept has three different components: (1) self-image – the view you have of yourself; (2) self-esteem or self-worth – the value you place on yourself; and (3) ideal-self – what you wish you were really like.

In closer context to our study, the notion of interest is one of self-concepts as targets for activation. This has the potential to explain the mechanism through which the change in behaviour occurs as a result of self-perception process. James (1890) and later Markus and Nurius (1986) visualize the self-concept as combination of possible selves. They give an image of how people perceive themselves to be in the present, the future and as hypothetical potential state, simultaneously including selves that one aspires and fears, selves that show real capabilities, as well as potential to change in time, i.e. viewed as 'cognitive bridges between the present and the future, specifying how individuals may change over time from how they are now to what they will become' (Markus and Nurius, 1986, p.961)

The preceding overview serves as to give a general idea of what the self-concept is. The amount of studies on the topic is quite broad and comprehensive, therefore in this research I will have to focus on what is most relevant for our research questions. In the current paper I am investigating how commitment making works on changing behaviour of individuals. One of the aspects covered is what is the exact role of self-concept on this

process. The self-perception theory points to the assumption that in their own reasoning if people follow certain behaviour voluntarily, then they believe that they must have desired this behaviour. This means that their behaviour is in line with their self-concept. This is why it is expected that commitment making can lead to change in the behaviour, while the self-concept mediates this effect. Several questions arise as to what exactly happens with the self-concept after the act of commitment making. As Demo emphasises in his work on self-concept (1992), it is important to look at the idea of self-concept in its full sense – being both a structure and a process, as well as being both stable over time and situationally adaptable. Its dynamic nature has been emphasized by other researchers too. Markus and Wurf (1987) dedicate an article with this being the main focus. They lean on previous research as well as own conclusions that self-concept should be seen as multidimensional phenomenon that combines ‘images, schemas, conceptions, prototypes theories, goals, or tasks’. When it comes to the point of its stability, nowadays the self-concept is seen as it is seen as being stable in the sense that corresponds to the natural need of people to have a ‘consistent picture of who they are in order to know how to act in different situations’ and the natural ‘proclivity to see oneself as the same person everyday’ (as stated by Demo, 1992). But while the mentioned above holds true, at the same time different aspect of the self-concept shifts the point to the observation that changes in self-attitudes, self-esteem and in general in the self-concept do occur, influenced by changes in the environment and under internal and external influences, according social pressure, processed feedback and other determinants, or as put by Demo again: the self-concept ‘responds to situational stimuli, incorporates new elements, rearranges, adjusts, and stabilizes temporarily before encountering new stimuli and undergoing further revisions’. In relation to this research this gives reason to assume with more confidence the mediating role of the Self-concept in our model. The self-concept has both the potential to

influence behaviour and to be influenced by behaviour, both to alter itself according to a manipulation and to lead to change on its own.

In their extensive research on the self-concept, Markus and Wurf (1987) focus on the quality of the self-concept to guide and control behaviour, while also point out that the opposite relationship also deserves as much attention. The current study works in this direction too, while focusing more closely on the commitment activating the process, the self-concept – mediating it, and the behaviour changing as an outcome. Also in this current study I looked at the self-concept framing it through the aspect of interest, i.e. the environment. People possess develop many actual possible selves, according to the perspective of interest, so when it comes to identity associated with environmental topics, issues, concerns, behaviours and so on, one might say they form a so called environmental self-concept.. Further in this study we refer to the self-concept, meaning its link to environmental topics. This being established, I present my third hypothesis:

H3: The change in self-concept mediates the effect of commitment making on behaviour change.

In close relation to the concepts and processes discussed so far is worth to mention a certain technique - The Foot in The Door Technique. It consists of getting an individual to voluntarily agree on a small request, only to be presented with a larger one later. It is a compliance tactic that proves effective. The larger request is the target one. (Freedman, J. L., & Fraser, 1966; Burger, 1999; Dillard, 1990) Turns out that most often the reason for agreeing with the initial request is not of importance. Could be out of politeness or to keep a good a face, or other, but agreeing to small requests opens up the path to compliance with bigger one, building up in the direction of a desired behaviour or attitude formation or change. This has to do a lot with the prior discussed preference for consistency and the self-

image. When presented with the target request, respondents recall the initial request, which serves as an indicator of their prior behaviour – a reference point. And even though the later request is much bigger, out of need for consistency they find themselves cooperating in order to keep a stable image of themselves. It is not surprise that the technique has found wide application in the domain of environmental sustainability as a weapon for environmental behaviour change. Indeed the foot in the door effect much resembles and on a lot of points overlaps the commitment strategy as concept. Or more precisely, it is vice versa.

Preference for consistency

Cialdini (1984) argues that people want to be and appear consistent as well as that they prefer to be around such people who behave consistently. This means that desire for consistency can have power over behaviour. People differ in the degree of preference for consistency and according to that they may be more or less likely to bring their behaviour in line with their previous choices and self-concept. In this paper I expect that preference for consistency acts as moderator in the previously outline effect of commitment making on behaviour through the individuals self-concept. I hypothesize that:

H4: The effect of self-concept on behaviour is stronger for people high in preference for consistency.

Overview of hypotheses and variables, conceptual model

To sum up what has been argued above, I aim to examine whether self-concept mediates the effect of commitment making on behaviour change and if the strength of it depends on the level of preference for consistency in the individual. The following hypotheses were designed in order to test for main effects, as well as mediation and moderation effects:

H1: Commitment making will lead to:

H1a: A positive change in pro-environmental behaviour

H1b: A significant positive change in pro-environmental intention.

H1c: A significant positive change in environmental concern.

H2: Commitment making will lead to a change in the environmental self-concept.

H3: This change in self-concept mediates the effect of commitment making on behaviour change.

H4: The effect of self-concept on behaviour is stronger for people high in preference for consistency.

In other words, I am looking to find whether the treatment effect (in the form of commitment making) is mediated by the self-concept, while the preference for consistency acts as moderator. The result would be the process of moderated mediation, where the moderator variable affects the path between the mediator and the outcome, as illustrated in the model below in Figure 1. The model explains graphically the hypotheses, while an overview of the investigated variables can be observed in Table 1. More detailed description will be given in the next chapter.

Figure 1.

Conceptual model

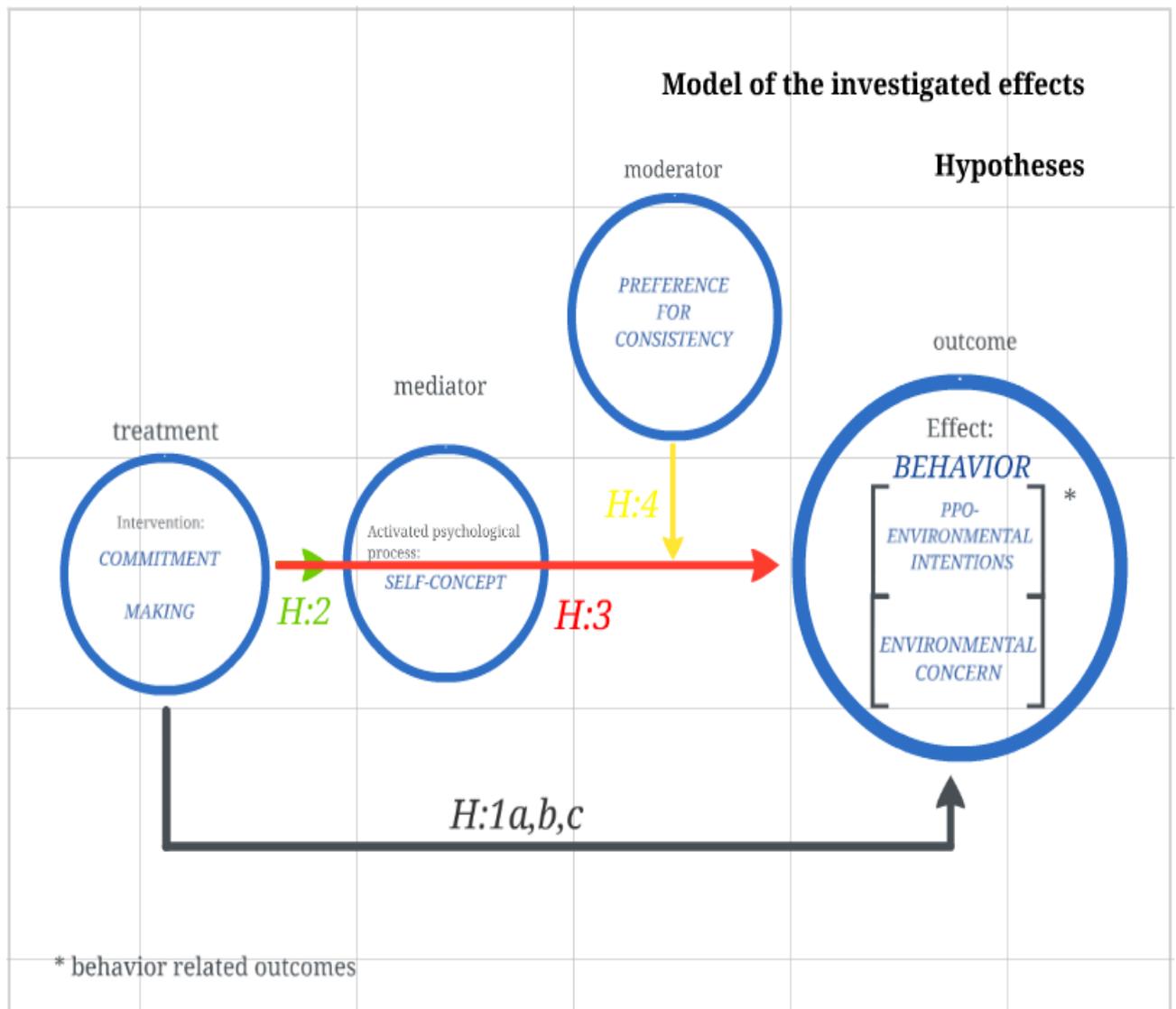


Table 1.

Investigated variables

| | Variable | Description | Characteristics |
|-----------------------|------------------------------|----------------------------------|---|
| Independent variables | Preference for consistency | A continuous moderator variable | Scores with higher numbers for higher need for consistency |
| | Commitment | A dichotomous treatment variable | Commitment making vs. no commitment making |
| Dependent variables | Self-concept | A continuous mediator variable | Scores with higher number indicating more change in self-concept |
| | Behaviour | A continuous outcome variable | Bigger number of participants in donating indicates more willingness to contribute, i.e. bigger change in behaviour |
| | Pro-environmental intentions | A continuous outcome variable | Scores with higher number indicating greater intention |
| | Environmental concern | A continuous outcome variable | Scores with higher number indicating more concern |

Methods

Design

The experiment was a 2 (Manipulation: Commitment vs. Control) X 2 (Preference for consistency: Low vs. High) between subject factorial design. The first independent variable was manipulated using two levels –commitment making versus the control group. For this purpose participants were randomly divided into treatment and control group. The second independent variable, preference for consistency, was measured using a brief form of the Preference for Consistency scale, developed by Cialdini, Trost and Newsom (1995). Participants were classified as either low or high in PFC (see Materials and Measures).

Participants

Bachelor, master and PhD students from Wageningen University took part as participants. The experiment took place in a Wageningen University classroom until a sufficient number of participants were recruited. Participants were engaged via announcements on posters, leaflets and social media as well as via direct contact in the hallways of the university buildings. Persons who responded and appeared eligible for participation were requested to take part in filling in online questionnaires, following the instructions of the experimenter. 125 participated in total. During the stage of the analysis the sample was reduced to 117², of which 38% was male and 62% female. The age of participants was in the range 18-35 ($M = 23.49$, $SD = 3.49$). Most students were Dutch (56.4%), followed by Czech (6.8%), Bulgarian (6.8%), and the rest 30% students were from nineteen other nationalities. Most participants were Master students (55.6%), followed by

² One participant was excluded due to the fact that he did not follow the instructions of the experiment and therefore provided misleading information. Seven students that were randomly assigned as part of the control condition, chose not to participate in the voluntary pledge (that was the manipulation),. Lokhorst at al. (2013) observe in their meta-analysis that researchers proceed differently with refusals, according to the objectives of the study, and that a psychological researcher is most likely to be focused in the effects produced only by participants that volunteered to participate. Therefore we decided to exclude from the study the 7 participants that chose not to pledge, thus focusing on changes occurring only after volunteering.

Bachelor students (42.7%) and 1.7% PhD students. The duration of experiment was around 11 minutes per participant on average.

Procedure

Upon arrival, participants were given a seat at a computer in order to fill in an online survey for the purpose of the study. They were told to follow the instructions on screen as well as to feel free to ask the experimenter if something was unclear or they had additional questions concerning the study.

Upon completing the survey participants were thanked by the experimenter and were offered an option to leave their name and contact information, so they could take part in a random selection among participants at later stage, where two of them won a voucher worth 25 Euro. They were given a small reward in the form of a chocolate bar or fruit in gratitude for taking the time to contribute to the research and they were dismissed.

Materials and measures

A series of questionnaires were presented on screen to the participants, as well as a request for demographic information at the end – nationality, age, gender, study program, and an option for participants to leave a comment or recommendation of a sort. The survey was generated using Qualtrics software, Version 2013 of the Qualtrics Research Suite. The survey itself began with a welcome message, followed by a brief introduction of the general objective of the study, information about the duration of completion, incentives for participating and assurance for anonymity. The instructions message is presented in Appendix A.

Independent variables

Preference for consistency. The experiment started with a questionnaire measuring preference for consistency. We used the brief form of the Preference for Consistency scale,

developed by Cialdini, Trost and Newsom (1995). It consists of 9 items that represent statements about oneself that are scored on a 9 point scale with the answer options: ‘Strongly disagree’, ‘Disagree’, ‘Somewhat disagree’, ‘Slightly disagree’, ‘Neither agree or disagree’, ‘Slightly agree’, ‘Somewhat agree’, ‘Agree’, ‘Strongly agree’. Example items are: *It is important to me that those who know me can predict what I will do*, *The appearance of consistency is an important part of the image I present to the world* and others. The complete questionnaire can found in Appendix B.

Commitment. The second part of the experiment contained the manipulation. The software assigned participants to either one of the two conditions – treatment condition (which involved an option for volunteer commitment) and control condition (no commitment making). Participants who were assigned to the control condition continued directly with the third phase. Participants in the commitment condition were first given a short introduction of the meaning of ‘pledging’ and explained that as a part of an environmental campaign for sustainability the organizers are collecting volunteer pledges from students. Participants were explained that next to the screen they could find on a clip-board a sign-sheet and a list of possible pro-environmental behaviours such as *‘bring my own reusable bags to the grocery store’* for example. They were invited to pick one (or write down one of their own) that felt close to them and their future intentions, and if they decided to participate, to write it down on the sign-sheet (‘I pledge to..’), add a few sentences of their own on the topic and sign with their name and signature. They were also informed that the individual pledges might later be published in a student magazine in an article about students and sustainability and by signing the pledge they agreed to this. Whoever decided to participate, signed the sheet and indicated in the online survey that they took part. The instructions and materials for this phase of the experiment can be seen in Appendix C, Appendix D and Appendix E.

After all responses were collected, the independent variable PFC was operationalized by performing a median split to create the high PFC and the low PFC groups. The range of scores on the 9 point scale was from 3 to 7.67 ($M = 5.79$, $SD = 1.05$). The median score was 5.89. Participants with scores on the scale from 3 to 5.9 were labelled Low PFC ($n = 61$, and those with scores from 6.0 to 7.7 – High PFC ($n = 56$).

Dependent variables

Environmental self-concept. Next, the experiment involved participants in both conditions completing a scale that measured participant's environmental self-concept. For the purpose of the study a scale was developed and we measured the extent to which participants see themselves as *'the kind of person who typically engages in each of these behaviours or is likely to engage in this behaviour'*. The overall procedure and the developed scale in this phase were adapted from the study of Burger and Caldwell (2003). Their scale was developed to measure self-concept of participants in regard to helpful behaviour. In a similar way, the adapted version of their scale served as such that measures self-concept when it comes to pro-environmental behaviour. The scale proved to be very reliable with Cronbach's Alpha .92. Example of items used in the scales are: *Volunteer time to help a pro-environmental cause, Show concern for environmental problem, Consider what I might do to contribute to better environment*, etc. For each item, participants were asked to indicate extent to which they are *'the kind of person who typically engages in each of these behaviours or is likely to engage in this behaviour'*. The whole scale can be found in Appendix G. It consisted of 10 questions, that were mixed among other questions taken from The Big Five Inventory scale (John, Neumann and Soto, 2008). They were standard random personality measures that served to mask the ten questions which are the ones of interest for the current study. Their results were

not processed further and were deleted later on from the data set when preparing the data for the analysis.

Pro-environmental intentions. The experiment continued with a scale to measure environmentally friendly behaviour intention using 6 items. The scale was adopted from Antil and Benett (1979). The scale showed high reliability (Cronbach's Alpha = .78). Example items are: *I would be willing to stop buying products from companies guilty of polluting the environment even though it might be inconvenient for me; I would consider joining a group or club which is concerned with the environment.* Items were scored on a five-point-scale ranging from 'Strongly disagree' to 'Strongly agree'. The full scale can be seen in Appendix H.

Environmental concern. The Next part of the survey consisted of 8 items measuring the next dependent measure – environmental concern. The scale proved to be reliable (Cronbach's Alpha – .70) Example items are: *It is still the case that the major part of the population does not act in an environmentally conscious way, Environmental-protection measures should be carried out even if this reduces the number of jobs in the economy.* Items were being scored on a five-point-scale ranging from 'Completely disagree' to 'Completely agree'.

Behaviour. The survey finished with end-of-survey message, where we thanked participants for their contribution to this research, provided an e-mail address to which they could write if they had interest in the outcome of the study and informed them that we are also collecting money to donate to World Wide Fund for Nature (WWF). We asked them if they were willing to participate and that if they were, that there was a donation box at the main desk where they could leave an amount money of their choice, and that we would

donate the collected sum to the organization on their behalf. This final question served in fact as our fourth dependent measure, contributions, which served as a measure of actual behaviour.

Results

Correlations

The first step was to examine the correlations between the variables. Table 2 shows the significantly correlated variables. No significant correlations were found between preference for consistency and any of the other variables. Neither did we find a correlation between the self-concept and contribution. Self-concept correlated well with pro-environmental intentions as well as environmental concern; the latter correlated as well with both pro-environmental intentions and contribution; a significant correlation was found also between contribution and pro-environmental intentions.

Table 2.

Correlations between variables

| | Mean | Standard Deviation | PFC | SC | PEI | EC | C |
|---------------------------------|------|-----------------------|--------|---------|---------|---------|---|
| Preference for consistency | 5.79 | 1.05 | 1 | | | | |
| Self-concept | 4.34 | 1.02 | 0.003 | 1 | | | |
| Pro-environmental intentions | 3.58 | 0.65 | -0.093 | 0.751** | 1 | | |
| Environmental concern | 3.85 | 0.49 | -0.004 | 0.648 * | 0.684** | 1 | |
| Contribution | 1.24 | 0.42 | -0.109 | 0.175 | 0.247** | 0.198 * | 1 |

Two tailed *=p<.05, **=p<.01

Hypotheses testing

We proceeded with running a MANOVA analysis in order to test our hypotheses. The treatment condition (commitment vs. control) and Preference for Consistency (High vs. Low) were used as independent variables, and self-concept, environmentally friendly intention, environmental concern and behaviour were used as dependent variables.

The results indicate no significant effects.. There was no significant main effect of the treatment condition on the self-concept as well ($F(1,115) = 0.00, p = .95$). Also no main effect of the treatment condition on pro-environmental intentions ($F(1,115) = 0.06, p = .81$), environmental concern ($F(1,115) = 0.14, p = .71$) and contribution ($F(1,115) = 0.00, p = 0.98$). No moderation effect of preference for consistency was found as well. Table 3. Shows the mean scores and standard deviations of the dependent variables for the conditions.

Table 3.

Mean scores of the dependent variables among conditions

| | | Mean | Standard Deviation | N |
|------------------------------|-----------|------|--------------------|----|
| Self-concept | treatment | 4.34 | 0.91 | 54 |
| | control | 4.34 | 1.11 | 63 |
| Pro-environmental intentions | treatment | 3.6 | 0.6 | 54 |
| | control | 3.57 | 0.71 | 63 |
| Environmental concern | treatment | 3.83 | 0.45 | 54 |
| | control | 3.86 | 0.53 | 63 |
| Contribution | treatment | 1.24 | 0.43 | 54 |
| | control | 1.24 | 0.43 | 63 |

These results indicate no treatment effect, therefore Hypothesis 1 and Hypothesis 2 were rejected. There was no moderation effect of preference for consistency and were no

main effects found, which meant that the key assumptions for investigating further were not met, and we could not proceed with investigating the assumed presence of moderated mediation that would have proven Hypothesis 3 and Hypothesis 4.

Discussion

Commitment strategies have been widely used recently in the field of environmental psychology and related disciplines. Lokhorst et al. (2013) give an overview in their meta-analysis of many recent studies in the area and prove that there is indeed an effect of commitment on behaviour. Unfortunately, in our study, we did not manage to replicate this result and to prove a main effect in order to investigate further the proposed mediation in this commitment to behaviour relationship. The commitment did not affect environmental behaviour, nor the pro-environmental intention and environmental concern. Also no change in the environmental self-concept was observed. I will investigate these results and try to find explanations for these unexpected findings.

In order to measure behaviour as a result of commitment, we included in the study design an option for participants to donate money through us to WWF – an environmental organization of our choice. We expected that participation in the commitment condition would stimulate people to act more environmentally friendly and this would reflect stronger willingness to contribute to a given cause. Results did not show an effect and there was almost no difference between committing and not committing participants. Reflecting on the commitment manipulation we would assume that either such effects as the ones we were looking for do not exist or that the treatment was not proper for the model, thus not eliciting the results we were expecting. Much more likely the latter was true, considering the decent amount of scientific evidence in favour to the existence of such causal relationship (see Theoretical background section). According to Burger and Caldwell (2003) ‘procedures used to create the manipulation often trigger other processes that counteract or overwhelm the self-perception process’. For example participants may think that few others perform this behaviour, i.e. conforming to perceived norms might be stronger than a self-perception process (DeJong,

1981). For example in my study might have been the case that the social norms influence and social pressure to take part in the pledge interfered. Social norms are “the common and accepted behaviours for a specific situation” as defined by Gockeritz, Schultz, Rendon, Cialdini, Goldstein and Griskevicious (2010). And even though that the publicity of the commitment is often accounted for the effectiveness of it, that might not be the trigger. Participants were coming often in groups to fill in the questionnaires and even though it seemed that they took part voluntarily, it is possible that internally this process was not perceived as such, but more as an obligation and a result of mass expectations. Furthermore Lokhorst (2009) argues that it may be that exactly the ‘personal norms underlie the process through which people change their behaviour upon making a commitment to do so’, no matter if the commitment is done in public or more anonymous.

That is to say that whatever the reason, the result is that commitment making does not act as expected according to understanding of it and its powers to lead to changes. This means that either the understanding of it should be questioned and with it deepened and altered, or profound analysis on the possible sources of complications of its functioning should be made.

According to Lokhorst (2009) most of the studies that explore commitment making, show that it is effective, but only in combination with other interventions. My research had only commitment as manipulation and it proved ineffective alone. It is possible that commitment alone is not that effective as one might hope, though not enough research has been done so far to conclude that. Though it is worth to consider in this context, the so called ‘file drawer effect’, according to which, there is tendency for only significant results to get published. Therefore future researchers in the area do not have access to information about studies where similar expected results were not found, which also could be useful in a way.,

even if only to help rule out the solo effectiveness of commitment as intervention. If further investigation is made on only commitment as a target tool, one must broaden the research area around commitment - as much as possible relevant aspect that influence directly or indirectly its functioning. One must examine deeper the barriers that hinder its functioning, the antecedents to commitment, what more specific circumstances enable commitment to lead to self-perception change and further behaviour change or maintenance of certain behaviour, as opposed to those that have no effect or even negative effect. On the other hand the combination of commitment with other manipulations opens a broad field of possible research in combinations of tools and strategies. Alternative research should also investigate the various consequences of commitment.

Looking back at my experiment and the way it was administered, I believe that it was not perceived so by majority of participants as realistic. My general impression was that most of them were not so accustomed with the term pledging and even though definition was provided, this only succeeded in informing them, but the idea might have not taken root and evoke sense of importance of that action of signing, this might have left to compliance to the request to pledge, rather than actual realized commitment that is supposed to lead to internalization of environmental self-concept change.

Back to the theory about self-concept and self-concept activation elaborated in the theoretical background section, it is plausible to assume in the light of the results of the study that not enough attention was given to making the desired self-concept aspect active. Therefore leaving them inaccessible for the manipulation. Wheeler, DeMarree and Petty (2007) look at the active-self account as an account in which primed constructs influence behaviour while momentarily shifting the currently accessible self-concept. According to it, changes in the self can establish which motivational and behaviour aspects result in

behaviour. The authors propose this account as a tool for predicting and comprehending the effect of behavioural shifts when the process goes beyond the mere perception-behaviour connection. They summarize postulates of the active-self account. According to those, the aspects of the self that influence behaviour are exactly the ones that are present at the moment in the active self-account. This further suggests that the self-concept consists of both active and chronic self-concept. External manipulation such as priming, or in our case commitment making was meant to shift the active self-concept and result in desired behaviour, but manipulation most likely was not strong enough to induce this result.

Limitations

Considering the willingness among student to contribute, we assess as a limitation the several situational reasons that students had for not participating with donation. One of them is the fact that the experiment was held in a university room where participants often came without wallets, having left them in the library where they study for the day; or if they came with wallet, they often did not have cash, as the university does not operate with cash money, students had only their bank cards. A lot of students excused themselves saying that they already participate in the organization and money is transferred each month (even though they were not asked to comment in any way as to why not contributing). As mentioned earlier Wageningen students have the reputation to be on average more knowledgeable and active on environmental topics than another more random sample. So maybe that could be a reason for students to rather donate directly themselves (since they are environmentally active) than through the researchers.

The two manipulation conditions were unable to evoke differences in any of the dependent measures. I consider it a shortcoming that no pre-test was made in order to check

the effectiveness of the treatments. Naturally I recommend this to be included in similar future research in order to observe the strength of designed manipulation.

As another limitation I assess the reliance upon self-reported data'. Participants were indicating the frequency with which they engage in certain environmental behaviours. According to some researchers self-reports of environmental behaviour cannot be trusted to give accurate information for objective behaviour (e.g. Corral-Verdugo, 1997). Others on the other hand consider them as self-relatively accurate indicators of individuals environmental actions. (e.g. Gamba & Oskamp, 1994). Nevertheless the external validity of such data remains is most often questionable. The method will remain used widely under variety of circumstances because of its undeniable advantages, but one might be creative in use of other alternatives. For example there is a measure developed by Aarts and Dijksterhuis (2000), that is called response-frequency measure of general habit strength. It focuses on the way choices are made (what habits refer to) which makes it more deep than just asking people to report frequency of engaging in certain behaviour. Steg and Vlek (2009) point to the fact that this measure is indeed been successfully used in series of studies on ecological behaviour (e.g. Aarts and Dijksterhuis, 2000; Aarts et al., 1998, Klockner, Matthies and Hunecke, 2003).

Recommendations for future research

For future research we recommend testing the same hypotheses, but through a more elaborated and intricate methodology, where the design of the study reflects more accurately the complexity and depth of the variables at hand. Enough time should be provided between manipulation and the following testing whether changes have occurred. Self-perception and behaviour change activation need certain time to take root within the individual. We recommend research to be focused on specific behaviours, rather than pro-environmental behaviours in general; that would result in more precise findings and better internal validity.

Levels of involvement could be included, i.e. several conditions, much like the study of Burger and Caldwell (2003) on foot in the door effect, where there were four conditions (foot in the door condition, payment condition, enhancement condition and control condition). In our case there could be commitments on different levels, for example with increasing salience, where we could have observed at what level an effect occurs. We advise a broader and more representative sample for the study to ensure a good external validity.

In order to encourage environmental behaviour after commitment, in an improved version of this research, and where resources allow for this, is advisable that researchers facilitate in a way a supportive physical environment for the target behaviour (McKenzie-Mohr, 2000). For example, participants might be invited to pledge that they will not use plastic cups and be provided with a mug along. This will have a double positive effect, as it will also serve as a reminder of commitment that has been made.

Last but not least, the form of commitment, be it pledging or another variation, should appear as realistic as possible to participants, in order to be effective. That is to say that the objective should be masked well, so participant experience a real commitment within, and perceive it as such even subconsciously in order for the psychological processes to be activated as a result. And as mentioned previously in the reflection, the current study might have failed in providing realising administration of the manipulation.

Conclusions

The current study did not succeed in proving the hypothesised effects. It was successful in providing a glimpse of how multifaceted commitment making is as manipulation and how complex it functions depending on variety of factors and considerations that have to be kept in mind and examined beforehand. One's self-concept, even considered as shifting and

evolving, might for good or worse more stable, so in order to change it, stronger influence is might be needed. Main question remains, are commitment strategies they better suited for altering general environmental behaviours, or should they be used rather directed towards improving individuals 'concrete ecological actions.

References

- Aarts, H., & Dijksterhuis, A. P. (2000). The automatic activation of goal-directed behaviour: the case of travel habit. *Journal of Environmental Psychology*, 20, 75–82.
- Aarts, H., Verplanken, B., & Van Knippenberg, A. (1998). Predicting behaviour from actions in the past: repeated decision making or a matter of habit? *Journal of Applied Social Psychology*, 28, 1355–1374.
- Abrahamse, W., Steg, L., Vlek, C., & Rothengatter, T. (2005). A review of intervention studies aimed at household energy conservation. *Journal of Environmental Psychology*, 25, 273-291.
- Antil, J.H & Bennett, P.D. (1979). Construction and validation of a scale to measure socially responsible consumption behaviour. In Henion, K.E & Kinnear, T.R. (Eds). *The Consumer society*, American Marketing Association, Chicago, IL, pp. 51-68.
- Bachman, W. & Katzev, R. (1982). The effects of non-contingent free bus tickets and personal commitment on urban bus ridership. *Transportation Research Part A: Policy and Practice*, 16, 103-108.
- Baumeister, R.F. (Ed.) (1999). *The Self in Social Psychology*. Philadelphia, PA: Psychology Press (Taylor & Francis).
- Bechtel, R. B., & Churchman, A. (2002, Eds.) *Handbook of environmental psychology*. New York: Wiley
- Becker, H. S. (1960). Notes on the Concept of Commitment. *American Journal of Sociology*, 66(1): 32-40.
- Bem, D. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 6, pp. 1-62). San Diego, CA: Academic Press.

- Bonnes, M. & Bonaiuto, M. (2002). Environmental psychology: From spatial-physical environment to sustainable development. In R. B. Bechtel & A. Churchman (Eds.), *Handbook of environmental psychology* (pp. 28–54). New York: Wiley.
- Burger, J. M. (1999). The foot-in-the-door compliance procedure: A multiple-process analysis and review. *Personality and Social Psychology Review*, 3(4), 303-325.
- Burger, J. M. and D. F. Caldwell (2003). The Effects of Monetary Incentives and Labelling on the Foot-in-the-Door Effect: Evidence for a Self-Perception Process. *Basic and Applied Social Psychology* 25(3): 235-241.
- Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity and compliance. In S. T. Gilbert, Fiske & G. Lindzey (Eds.), 4th ed. The handbook of social psychology, Vol. 2 (pp. 151–192). Boston: McGraw-Hill.
- Cialdini, R. B., Cacioppo, J. T., Bassett, R., & Miller, J. A. (1978). Low-ball technique for producing compliance: Commitment and then cost. *Journal of Personality and Social Psychology*, 36, 463–476.
- Cialdini, R. B., Trost, M. R., & Newsom, J. T. (1995). Preference for consistency: The development of a valid measure and the discovery of surprising behavioural implications. *Journal of Personality and Social Psychology*, 69, 318-318.
- Cialdini, R.B. (1984). *Influence, the psychology of persuasion*", New York: Harper Collins.
- Cialdini, R.B. (1985). *Influence: Science and practice*. Glenview, IL: Scott, Foresman
- Commitment. (1913). In *Webster's Revised Unabridged Dictionary*. Retrieved April 02, 2013, from <http://www.wordvia.com>

- Corral-Verdugo, V. (1997). Dual 'realities' of conservation behavior: Self-reports vs. observations of reuse and recycling behavior. *Journal of Environmental Psychology*, 17, 135–145.
- DeJong, W. (1981). Consensus information and the foot-in-the door effect. *Personality and Social Psychology Bulletin*, 7, 423–430.
- Demo, D. H. (1992). The self-concept over time: Research issues and directions. *Annual review of Sociology*, 18, 303-326.
- Diekmann, A. & Franzen, A (1999). The Wealth of nations. *Environment and behaviour*, 31 (4), pp 540-549
- Dillard, J. P. (1990). Self-Inference and the Foot-in-the-Door Technique Quantity of Behavior and Attitudinal Mediation. *Human communication research*, 16(3), 422-447.
- Dolnicar, S. & Grun, B. (2009). Environmentally friendly behavior - can heterogeneity among individuals and contexts/environments be harvested for improved sustainable management? *Environment & Behavior*, 41 (5), 693-714.
- Dwyer, W. O., Leeming, F. C., Cobern, M. K., Porter, B. E., & Jackson, J. M. (1993). Critical review of behavioral interventions to preserve the environment research since 1980. *Environment and Behavior*, 25(5), 275-321.
- Franken, R. 1994. *Human Motivation* (3rd ed.). Pacific Grove, CA: Brooks/Cole pub.
- Freedman, J. L., & Fraser, S. C. (1966). Compliance without pressure: the foot-in-the-door technique. *Journal of personality and social psychology*, 4(2), 195.
- Gamba, R. J., & Oskamp, S. (1994). Factors influencing community residents' participation in commingled curbside recycling programs. *Environment & Behavior*, 26, 587–612.

Gardner, G. T., Stern, P. C. (2002). *Environmental problems and human behaviour* (2nd ed.). Boston, MA: Pearson Custom Publishing.

Global Footprint Network (2006). *National Footprint Accounts*. 2006 Edition. Available at <http://www.footprintnetwork.org>

Gockeritz, S., Schultz, P., Rendon, T., Cialdini, R., Goldstein, N. and Griskevicious, V. (2010). 'Descriptive normative beliefs and conservation behavior: The moderating roles of personal involvement and injunctive normative beliefs'. *European Journal of Social Psychology*, 40 , 514-523

Gonzales, M.H., Aronson, E., & Costanzo, M.A. (1988). Using social cognition and persuasion to promote energy conservation: A quasi-experiment. *Journal of Applied Social Psychology*, 18, 1049-1066.

Gopinath, M & Nyer. P. U. (2007). *Intern. J. of Research in Marketing* 26 (2009) 60–68

Halverson, R. R., Pallak, M. S. 1978. Commitment, ego-involvement, and resistance to attack. *J. Exp. Soc. Psychol.* 14: 1-12

Hollenbeck, J. R., Williams, C. R., & Klein, H. J. (1989). An empirical investigation of the antecedents of commitment to difficult goals. *Journal of Applied Psychology*, 74, 18–23.

Yabut (2013). *Its ok to be green minded*. [Drawing]. Retrieved September 29, 2013 from <http://pipemagazine.tumblr.com/>

James, W. (1890). *Principles of Psychology*. 2 vol., N.Y., Holt.

- John, O. P., Naumann, L. P., & Soto, C. J. (2008). Paradigm Shift to the Integrative Big-Five Trait Taxonomy: History, Measurement, and Conceptual Issues. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.)
- Katzev, R. D. & Pardini, A.U. (1988). The comparative effectiveness of reward and commitment approaches in motivating community recycling. *Journal of Environmental Systems*, 17, 93-113.
- Katzev, R., & Wang, T. (1994). Can commitment change behavior? A case study of environmental actions. *Journal of Social Behavior & Personality*.
- Kaufmann-Hayoz, R. (2006). Human action in context: A model framework for interdisciplinary studies in view of sustainable development. *Umweltpsychologie*, 10, 1, 154–177.
- Kerr, N. L., Garst, J., Lewandowski, D. A., & Harris, S. E. (1997). That still, small voice: Commitment to cooperate as an internalized vs. a social norm. *Personality and Social Psychology Bulletin*, 23, 1300-1311
- Kiesler, C. A., & Corbin, L. H. (1965, December). Commitment, attraction, and conformity. *Journal of Personality & Social Psychology*, 2(6), 890–895.
- Kiesler, C. A., Roth, T. S., & Pallak, M. S. (1974, November). Avoidance and reinterpretation of commitment and its implications. *Journal of Personality & Social Psychology*, 30(5), 705–715.
- Kiesler, C. A., Zanna, M., & Desalvo, J. (1966, April). Deviation and conformity: Opinion change as a function of commitment, attraction, and presence of a deviate. *Journal of Personality & Social Psychology*, 3(4), 458–467.

- Klockner, C. A., Matthies, E., & Hunecke, M. (2003). Problems of operationalising habits and integrating habits in normative decision-making models. *Journal of Applied Social Psychology, 33*, 396–417.
- Kollmuss, A and Agyeman, J (2002): Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research, 8:3*, 239-260
- Lehman, P. K., & Geller, E. S. (2005). Behavior analysis and environmental protection: Accomplishments and potential for more. *Behavior and social issues, 13*(1), 13-32.
- Lokhorst, A. M. (2009). *Using commitment to improve environmental quality*. Social and Organisational Psychology, Faculty of Social and Behavioral Sciences, Leiden University.
- Lokhorst, A. M., van Dijk, J., Staats, H., van Dijk, E., & de Snoo, G. (2010). Using tailored information and public commitment to improve the environmental quality of farm lands: an example from the Netherlands. *Human ecology, 38*(1), 113-122.
- Lokhorst, A. M., Werner, C., Staats, H., van Dijk, E. & Gale, J. L. (2013). Commitment and Behavior Change: A Meta-Analysis and Critical Review of Commitment-Making Strategies in Environmental Research. *Environment and Behavior, 45*(1), 3-34.
- Markus, H., & Nurius, P. (1986). Possible selves. *American psychologist, 41*(9), 954.
- Markus, H. R., & Wurf, E. (1987). The dynamic self-concept: A social psychological perspective. *Annual Review of Psychology, 68*, 299-337
- McKenzie-Mohr, D. (2000). *New ways to promote proenvironmental behavior: Promoting sustainable behavior: An introduction to community-based social marketing*. *Journal of Social Issues, 56*(3), 543-554.

- Messick, D.M. & Brewer, M.B (1983). Solving social dilemmas: a review. In: L. Wheeler, O. Shaver (Eds.), *Review of personality and social psychology*. Vol. 4 Sage, Beverly Hills, CA (1983), pp. 11–44
- Pallak, M. S.; Cook, D. A.; and Sullivan, J. J. 1980. Commitment and energy conservation. In L. Bickman (ed.), *Applied social psychology annual 1*: 235-254. Beverly Hills, CA: Sage.
- Qualtrics (2005). Qualtrics (Version 2013) [Computer software]. Provo, Utah, USA. Qualtrics Research Suite. Retrieved May 7, 2013 Available from <http://www.qualtrics.com>
- Redclift, M. & Woodgate, G. (Eds.) (1997). *The international handbook of environmental sociology*. Cheltenham, UK: Edward Elgar.
- Rev. 84:191-215
- Rogers, C. (1959). A Theory of Therapy, Personality and Interpersonal Relationships as Developed in the Client-centered Framework. In (ed.) S. Koch, *Psychology: A Study of a Science. Vol. 3: Formulations of the Person and the Social Context*. New York: McGraw Hill.
- Schmuck, P. & Schultz, W. (Eds.) (2002). *Psychology of sustainable development*. Norwell, MA: Kluwer.
- Smart, B. (2010). *Consumer society: Critical issues and Environmental Consequences*. London: SAGE Publications Ltd; p.177
- Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, 29(3), 309-317.

- Stern, P. C. (2000). New environmental theories: toward a coherent theory of environmentally significant behaviour. *Journal of social issues*, 56(3), 407-424.
- Vlek, C. (2000). Essential psychology for environmental policy making. *International Journal of Psychology*, 35, 153–167.
- Vlek, C., Steg, L. (2007). Human behavior and environmental sustainability: problems, driving forces and research topics. *Journal of Social Issues*, 63(1), 1–19.
- Vlek, C., Steg, L. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, 29, 309-217.
- Wang, T. H. and R. D. Katzev (1990). "Group Commitment and Resource Conservation: Two Field Experiments on Promoting Recycling1." *Journal of Applied Social Psychology* 20(4): 265-275.
- Wheeler, S. C., DeMarree, K. G., & Petty, R. E. (2007). Understanding the role of the self in prime to behavior effects: The Active-Self Account. *Personality and Social Psychology Review*, 11, 234–261.
- Winter, D. D. & Koger, S. M. (2004). *The psychology of environmental problems* (2nd Ed.) Mahwah, NJ: Erlbaum.
- World Bank. 1992. *World Development Report 1992 : Development and the Environment*. © World Bank
- Yabut (2013). *Its ok to be green minded*. [Drawing]. Retrieved September 29, 2013 from <http://pipemagazine.tumblr.com/>

Appendices

Appendix A

Welcome message and instructions for participants in the online survey

Welcome to this experiment and thank you for taking the time and effort to participate.

My name is Romila and the following survey is part of my WUR Master Thesis research experiment, that is related to the topic of pro-environmental behaviour. You are invited to contribute by filling in a sequel of standard online questionnaires in relation to some personal characteristics and behaviour. Participation takes around 15 minutes. Your answers will be completely anonymous and by filling out the survey you will be entered into a drawing for one of two 25 euro vouchers.

If you have any questions about the survey, please feel free to ask me.

You may now proceed by clicking the 'next' button located on the right (>>).

Appendix B

Preference for consistency Scale – Brief form

(Cialdini, Trost and Newsom, 1995)

Please indicate from 1 to 9 the extent to which you agree with the following statements.

(1 – Never engage in this behaviour to 7 – Very frequently engage in this behaviour)

1) It is important to me that those who know me can predict what I will do.

| | | | | | | | | |
|-------------------|----------|-------------------|-------------------|---------------------------|----------------|----------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Strongly disagree | Disagree | Somewhat disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Somewhat agree | Agree | Strongly agree |

2) I want to be described by others as stable, predictable person.

| | | | | | | | | |
|-------------------|----------|-------------------|-------------------|---------------------------|----------------|----------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Strongly disagree | Disagree | Somewhat disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Somewhat agree | Agree | Strongly agree |

3) The appearance of consistency is an important part of the image I present to the world.

| | | | | | | | | |
|-------------------|----------|-------------------|-------------------|---------------------------|----------------|----------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Strongly disagree | Disagree | Somewhat disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Somewhat agree | Agree | Strongly agree |

4) An important requirement for any friend of mine is personal consistency.

| | | | | | | | | |
|-------------------|----------|-------------------|-------------------|---------------------------|----------------|----------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Strongly disagree | Disagree | Somewhat disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Somewhat agree | Agree | Strongly agree |

5) I typically prefer to do things the same way.

| | | | | | | | | |
|-------------------|----------|-------------------|-------------------|---------------------------|----------------|----------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Strongly disagree | Disagree | Somewhat disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Somewhat agree | Agree | Strongly agree |

6) I want my close friends to be predictable.

| | | | | | | | | |
|-------------------|----------|-------------------|-------------------|---------------------------|----------------|----------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Strongly disagree | Disagree | Somewhat disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Somewhat agree | Agree | Strongly agree |

7) It is important to me that others view me as stable person.

| | | | | | | | | |
|-------------------|----------|-------------------|-------------------|---------------------------|----------------|----------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Strongly disagree | Disagree | Somewhat disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Somewhat agree | Agree | Strongly agree |

8) I make an effort to appear consistent to others.

| | | | | | | | | |
|-------------------|----------|-------------------|-------------------|---------------------------|----------------|----------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Strongly disagree | Disagree | Somewhat disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Somewhat agree | Agree | Strongly agree |

9) It doesn't bother me much if my actions are inconsistent. (reverse scored)

| | | | | | | | | |
|-------------------|----------|-------------------|-------------------|---------------------------|----------------|----------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Strongly disagree | Disagree | Somewhat disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Somewhat agree | Agree | Strongly agree |

Appendix C

The introduction of the meaning on 'pledging' and instructions how to participate in the campaign

In the context of pro-environmental actions and contribution of individuals, different forms of personal engagement exist. One of them is the so called 'pledging'. Pledging is defined as making a formal, usually public promise that you will do/try to do something. As a part of an environmental campaign for sustainability the organizers are collecting such volunteer pledges from students, where they are invited to pick a pro-environmental behaviour from a list and pledge to follow this behaviour. You can find the list on the desk next to your monitor. Please read it and choose a behaviour that you might be interested to follow and consider taking part in the pledge. If you are willing to participate, then all you need to do is to write down on the petition sheet 'I pledge to..', finish the sentence with the chosen behaviour, add one or two sentences on the topic and sign with your name and signature. You can consult with the previous entries on how to fill in or feel free to ask the experimenter at any time. The individual pledges might later be published in a student magazine in an article about students and sustainability and by signing the pledge you agree to this.

Appendix D

List of pledges

- I pledge to bring my own reusable bags to the grocery store.
- I pledge to make an intentional effort to turn off lights and electricity when I leave room.
- I pledge to not use plastic bags or plastic silverware.
- I pledge to not use paper and plastic cups.
- I pledge to unplug appliances when not in use.
- I pledge to take quick showers.
- I pledge to reuse paper on the back side.
- I pledge to avoid purchasing food with lots of packaging waste.
- I pledge to carry my own water instead of buying bottled water.
- I pledge to never let food spoil (eat it on time before it goes bad).
- I pledge to switch as many light bulbs as possible to CFLs (compact fluorescent light – each bulb saves 60% more energy).
- I pledge to remove myself from ‘Junk’ mail lists.
- I pledge to buy recycled products (paper, toilet paper, paper towels).

Appendix E
Sign-sheet for pledging

**Student pledges about engaging in pro-environmental behaviour
of choice**

May 2013

| No. | Pledge (I pledge to...) Please add as well few sentences on topic of this behaviour or your intentions to follow it | Name | Signature |
|------------|---|-------------|------------------|
| 30. | | | |
| 31. | | | |
| 32. | | | |
| 33. | | | |
| 34. | | | |

Scale for measuring environmental self-concept

Please indicate from one to 7 the extent to which you are *'the kind of person who typically engages in each of these behaviours or is likely to engage in this behaviour'*.

(1 – Never engage in this behaviour to 7 – Very frequently engage in this behaviour)

1. Volunteer time to help a pro-environmental cause

| | | | | | | |
|-------|--------|--------------|-----------|---------|------------|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Never | Rarely | Occasionally | Sometimes | Usually | Frequently | Very frequently |

2. Support a worthy pro-environmental cause

| | | | | | | |
|-------|--------|--------------|-----------|---------|------------|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Never | Rarely | Occasionally | Sometimes | Usually | Frequently | Very frequently |

3. Show concern for environmental problems

| | | | | | | |
|-------|--------|--------------|-----------|---------|------------|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Never | Rarely | Occasionally | Sometimes | Usually | Frequently | Very frequently |

4. Do pro-environmental work

| | | | | | | |
|-------|--------|--------------|-----------|---------|------------|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Never | Rarely | Occasionally | Sometimes | Usually | Frequently | Very frequently |

5. Do something to contribute to pro-environmental thinking and behaviour

| | | | | | | |
|-------|--------|--------------|-----------|---------|------------|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Never | Rarely | Occasionally | Sometimes | Usually | Frequently | Very frequently |

6. Give money for issues in regard to pro-environmental causes I believe in

| | | | | | | |
|-------|--------|--------------|-----------|---------|------------|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Never | Rarely | Occasionally | Sometimes | Usually | Frequently | Very frequently |

7. Feel concerned when I read about environmental issues

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|

| | | | | | | |
|-------|--------|--------------|-----------|---------|------------|-----------------|
| Never | Rarely | Occasionally | Sometimes | Usually | Frequently | Very frequently |
|-------|--------|--------------|-----------|---------|------------|-----------------|

8. Feel compassion about the burden on the environment

| | | | | | | |
|-------|--------|--------------|-----------|---------|------------|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Never | Rarely | Occasionally | Sometimes | Usually | Frequently | Very frequently |

9. Consider what I might do to contribute to better environment

| | | | | | | |
|-------|--------|--------------|-----------|---------|------------|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Never | Rarely | Occasionally | Sometimes | Usually | Frequently | Very frequently |

10. Do some kind of nonpaid pro-environmental service work

| | | | | | | |
|-------|--------|--------------|-----------|---------|------------|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Never | Rarely | Occasionally | Sometimes | Usually | Frequently | Very frequently |

Appendix H

Scale for measuring Intention for environmental behaviour change

1. I would be willing to pay more taxes to support greater government control of pollution.

| | | | | |
|----------------------|----------|------------------------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Disagree | Disagree | Neither Agree or Disagree | Agree | Strongly agree |

2. I would be willing to sign a petition to support an environmental cause.

| | | | | |
|----------------------|----------|------------------------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Disagree | Disagree | Neither Agree or Disagree | Agree | Strongly agree |

3. I would be willing to pay more each month for electricity if it meant cleaner air.

| | | | | |
|----------------------|----------|------------------------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Disagree | Disagree | Neither Agree or Disagree | Agree | Strongly agree |

4. I would be willing to stop buying products from companies guilty of polluting the environment even though it might be inconvenient for me.

| | | | | |
|----------------------|----------|------------------------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Disagree | Disagree | Neither Agree or Disagree | Agree | Strongly agree |

5. I would consider joining a group or club which is concerned with the environment.

| | | | | |
|----------------------|----------|------------------------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Disagree | Disagree | Neither Agree or Disagree | Agree | Strongly agree |

6. I would be willing to make personal sacrifices for the sake of slowing down pollution even though the immediate results may not seem significant.

| | | | | |
|----------------------|----------|------------------------------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Disagree | Disagree | Neither Agree or Disagree | Agree | Strongly agree |

Appendix I

Scale for measuring Environmental concern

- 1. It is still the case that the major part of the population does not act in an environmentally conscious way.**

| | | | | |
|------------------------|----------|------------------------------|-------|---------------------|
| 1 | 2 | 3 | 4 | 5 |
| Completely Disagree | Disagree | Neither Agree or Disagree | Agree | Completely agree |

- 2. There are limits to economic growth which our industrialized world has crossed or will reach very soon.**

| | | | | |
|------------------------|----------|------------------------------|-------|---------------------|
| 1 | 2 | 3 | 4 | 5 |
| Completely Disagree | Disagree | Neither Agree or Disagree | Agree | Completely agree |

- 3. Environmental-protection measures should be carried out even if this reduces the number of jobs in the economy.**

| | | | | |
|------------------------|----------|------------------------------|-------|---------------------|
| 1 | 2 | 3 | 4 | 5 |
| Completely Disagree | Disagree | Neither Agree or Disagree | Agree | Completely agree |

- 4. Thinking about the environmental conditions our children and grandchildren have to live under, worries me.**

| | | | | |
|------------------------|----------|------------------------------|-------|---------------------|
| 1 | 2 | 3 | 4 | 5 |
| Completely Disagree | Disagree | Neither Agree or Disagree | Agree | Completely agree |

- 5. When I read newspaper articles about environmental problems or view such TV-reports, I am indignant and angry.**

| | | | | |
|------------------------|----------|------------------------------|-------|---------------------|
| 1 | 2 | 3 | 4 | 5 |
| Completely Disagree | Disagree | Neither Agree or Disagree | Agree | Completely agree |

- 6. If we continue as before, we are approaching an environmental catastrophe.**

| | | | | |
|------------------------|----------|------------------------------|-------|---------------------|
| 1 | 2 | 3 | 4 | 5 |
| Completely Disagree | Disagree | Neither Agree or Disagree | Agree | Completely agree |

- 7. It is still true that politicians do far too little for environmental protection.**

| | | | | |
|------------------------|----------|------------------------------|-------|---------------------|
| 1 | 2 | 3 | 4 | 5 |
| Completely Disagree | Disagree | Neither Agree or Disagree | Agree | Completely agree |

8. For the benefit of the environment we should be prepared to restrict our momentary style of living.

| | | | | |
|------------------------|----------|------------------------------|-------|---------------------|
| 1 | 2 | 3 | 4 | 5 |
| Completely Disagree | Disagree | Neither Agree or Disagree | Agree | Completely agree |