VBN THEORY REVISED

An exploratory study on the interplay of individual and collective factors in explaining sustainable behaviour

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Abstract

During the last few decades, climate change has been a growing problem. Since the indisputable effect of mankind on this change, more sustainable behaviour needs to be accomplished to keep the planet livable. To understand how and why people tend to act sustainable, the Value-Belief-Norm model (VBN-model) has been cited extensively, premising a causal chain of intrapersonal factors, ultimately leading to pro-environmental behaviour. What has been overlooked so far in contemporary research on the VBN-model, is that the development of behaviour does not solely happen in a vacuum of intrapersonal processes, but takes place in a larger, social context. This research therefore poses that the VBN-model should be enhanced with social factors. Using theories originating from social psychology and sociology, this research reasons that these social factors influence personal values, beliefs, norms and behaviour of individuals. This research furthermore introduces efficacy beliefs to the original model and focuses solely on public-sphere pro-environmental behaviour, like signing petitions or supporting certain policies. Existing data of the European Social Survey (2016) were used, focusing on Dutch participants only, in order to test the presumed influences of social factors on the original VBN-model empirically. Multiple regressions as well as hierarchical multiple regressions were conducted through IBM SPSS Statistics 24, showing that social factors indeed predict the original factors in the VBN-model. It implies that the social environment influences climate change beliefs and personal norms and efficacy specifically. Additionally, the results imply that with the incorporation of social factors, mutual effects arise in the VBN-model. These partly put an end to the idea of a solely consecutive and causal chain of predictors, as the original VBN-model indicates. Since this research is of explorative nature, iterative research is recommended, as well as more research on specificities and mutually affecting relations.

Keywords**:** *Climate change – Value-Norm-Belief model – Public-sphere pro-environmental behaviour – Social factors – Efficacy*

Introduction

Climate change is rapidly proving to become one of the greatest challenges of this time. Its consequences are becoming more observable and affect the entire world – and its residents – both today and in the (near) future (McMichael, Woodruff & Hales, 2006).

Both gradual changes, such as the temperature rise of atmosphere and sea, acidification of oceans, and sea-level rise, as well as more acute changes, such as extreme drought or rainfall, are becoming increasingly perceptible. Forest fires and floods occur with increasing frequency and on a larger scale (Ligtvoet et al., 2015; IPCC, 2013). The change of the climate furthermore generates health problems present-day and will continue doing so in the future (McMichael, Woodruff & Hales, 2006).

Strengthening scientific evidence and consensus about the anthropogenic nature of climate change (climate change caused by human action) indisputably results in a need for more sustainable behaviour in order to keep the planet livable (IPCC, 2013).

With the scientific awareness that people have to change their behaviour in order to slow down climate change and its effects as much as possible, more public and political awareness were introduced as well (Capstick, Whitmarsh, Poortinga, Pidgeon & Upham, 2015). The past few years, initiatives on both trying to change the behaviour of citizens as well as turning the tide when it comes to policy on (inter)national level, a tipping point seems to have been reached. By way of illustration, the Climate Act was approved by the Senate last May (Eerste Kamer der Staten-Generaal, 2019). In March, more than 40.000 people protested in Amsterdam, enforcing a more active climate policy (NOS, 2019b) following Brussels, where over 70.000 people conveyed the same message (NOS, 2019).

Despite these social shifts, steps towards large-scale, structural behavioural change and the transition to a more sustainable society seem not yet at hand. Nonetheless, human choices, preferences and behaviour have major implications for climate-related issues. It is therefore of great relevance to understand what holds people back to substantially act more pro-environmental[1] and more generally why people tend to either act or do not act pro-

[1] The term pro-environmental behaviour entails behaviour that contributes positively to a more sustainable way of living on this planet (Steg & De Groot, 2019). Instead of sustainable behaviour, which is often used by media, this term will be used throughout this article.

environmental (Steg, 2016). Only then, appropriate and effective policies and interventions can be developed in order to make the step towards larger-scale change.

In that light, social sciences have been researching pro-environmental behaviour for a few decades. A major part of that research has been dedicated to investigating theories that underlie the (unconscious) establishment of pro-environmental behaviour. One of these theories entails the Value-Norm-Belief model (VBN-model), compiled by Stern and colleagues (2000). The theory is based on the premise that a causal chain of factors leads ultimately to pro-environmental behaviour. It explains values that are affecting beliefs, which in turn relate to personal norms and eventually evoke behaviour (see blue outline in Figure 1) (Stern, Dietz, Abel, Guagnano & Kalof, 1999; Stern, 2000).

Although this VBN-model is leading in most contemporary research on pro-environmental behaviour, it is merely focusing on intrapersonal processes. Its components and its relations towards one another are assuming an exclusively intrapsychic environment in which the formation of pro-environmental behaviour takes place. What has been completely overlooked so far is that the development of behaviour does not exist in such a vacuum, but takes place in a larger, social context.

This larger context cannot be neglected when studying the establishment of pro-environmental behaviour. After all, a continuous interaction between intrapersonal processes and the social context takes place, for example explained by the 'social identity theory' (Tajfel, 1979; Turner & Tajfel, 1986) and the 'social integration theory' of Durkheim (Tubergen, 2019). In that sense, the behaviour of an individual is always influenced by its environment.

Therefore, this research poses that the VBN-model should be enhanced with important nuances: more attention needs to be paid to the influence of social factors on the establishment of pro-environmental behaviour.

Consequently, in this article an adjusted version of the original model will be presented, proposing a new VBN-model that includes the interplay of personal and social factors and its influence on establishing pro-environmental behaviour (see Figure 1[2]). The theoretical framework that is offered subsequently, will further elaborate on both the original and the adjusted model, going into further detail about its components and presumed (inter)relations.

[2] The model emphasizes on larger relationships, nuances will be outlined in the text

Figure 1. VBN model – Adding collective factors

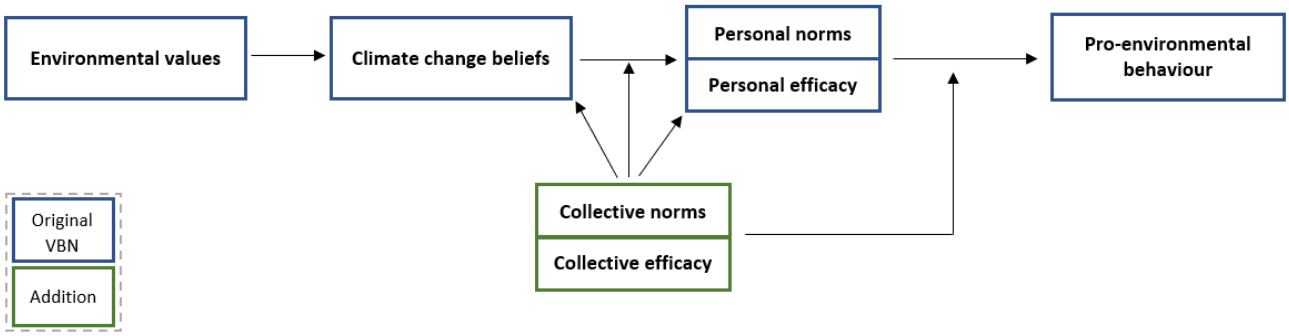

Figure 1. A schematic representation of the VBN-theory of environmentalism (Stern, 2000), including collective factors and its perceived relations.

Theoretical framework

Value-Belief-Norm theory in context

Previous research and theorizing have shown that, on the personal level, pro-environmental behaviour is shaped by values, beliefs and norms (Schwartz, 1977; Steg, 2016; Stern, et al., 1999; Stern, 2000). As explained above, the VBN-model of Stern and colleagues (2000) is most frequently cited when it comes to providing a theoretical framework to explain the establishment of pro-environmental behaviour, but is evidently not the only model trying to do so.

For example, the Norm Activation Model (NAM) was introduced at an earlier stage, assuming that pro-environmental behaviour derives from the activation of personal norms, that in turn are activated when feeling morally obligated to either act or do not act (Schwartz & Howard, 1981).

Additionally, the Protection Motivation Theory (PMT) proposes that people weigh out costs and benefits of acting pro-environmentally (Rogers, 1983). It poses that people are more likely to behave pro-environmental when they feel a high degree of threat – depending on the severity of environmental problems as well as perceived benefits of acting pro-environmentally. Furthermore, people will more likely act when they feel that their actions will contribute, addressing their perceived self-efficacy (Rogers, 1983).

The VBN-model attempted to use these theories and add to them, including newly obtained insights on climate change beliefs and values. This research, in turn, attempts to further improve VBN-model theory by introducing social factors. Doing this, the model will be rising in number of factors to consider and therefore possibly increase in complexity. Moreover, existing factors in the model will possibly start to interplay when adding social factors, influencing not only the way pro-environmental behaviour is established, but also the sequential order of doing so.

In order to get a deeper understanding of the VBN-model, we now first have a look into the factors as displayed in the original VBN-model.

Pro-environmental behaviour

Pro-environmental behaviour is defined as behaviour that deliberately limits the negative impact of actions on the environment, nature and ecological systems (Stern, 2000; Kollmuss & Agyeman, 2002). In practice, this kind of behaviour can be articulated on different levels. A division can be made between public-sphere (e.g. taking part in a protest) and private-sphere behaviour (e.g. purchasing renewable products). Most research in relation to the VBN-model has been done on private-sphere behaviour (Steg, 2016; Steg & De Groot, 2019). For that reason, this research will be focusing on public-sphere pro-environmental behaviour[3], which entails all behaviour that contribute to limiting the negative impact of actions on the environment conducted in the public sphere.

In turn, public-sphere behaviour can be divided into activist behaviour – advocacy actions to influence public policy – and non-activist behaviour – implicit public support and acceptance of public policies (Stern et al., 1999). Both are included in this research (for examples, see table 3).

Environmental values

Values are understood as abstract, overarching goals that serve as guiding principles in life and form an important fundament for the development of all kinds of behaviour (Schwartz, 1992; Dietz, Fitzgerald & Shwom, 2005). Value-representation of people is shaped more or less unconsciously and early in life, until approximately the age of twelve. After that, people's

[3] Although this term entails the correct expression of the concept, it will be phrased as public-sphere behaviour throughout this article, due to wordiness of the original term.

value sets stay relatively consistent through the course of life (Stern, 2000). After the development of the human value-scale by Schwartz (1992), the concept 'environmental values' gained in popularity to explain pro-environmental behaviour recently.

De Groot & Steg (2008) constructed four specific environmental values being egoistic, hedonistic, biospheric and altruistic values. Egoistic values focus on ways to increase resources such as status or money. Hedonistic values are concerned with improving good feelings and reducing efforts. Biospheric values emphasise on having concern for nature and a focus on the consequences of specific actions for the environment. Altruistic values focus on what benefits others (De Groot & Steg, 2008; Steg, 2016). Egoistic and hedonic values have been negatively related to pro-environmental behaviour, whereas the biospheric and altruistic values and have been related positively (Steg, 2016). Various studies show that environmental values mostly influence behaviour indirectly, via climate change beliefs and norms. (Stern, 2000; De Groot & Steg, 2008, Steg & De Groot, 2019). In turn, climate change beliefs are influenced by adhering to a certain set of values.

Climate change beliefs

Climate change beliefs entail propositional cognitions about climate change (Dunlap, Van Liere, Mertig & Jones, 2000). It regards the general belief of the existence of climate change and its seriousness, the belief of humanity's ability to (partly) cause climate change and the existence of limits to growth and gains (Steg & de Groot, 2019; ESS, 2016). Climate change beliefs are commonly measured by the New Environmental Paradigm (NEP) (Dunlap et al., 2000). The NEP is positively related to pro-environmental behaviour, although weakly (Dunlap et al., 2000). Climate change beliefs predict awareness of climate change in general. It furthermore indirectly predicts knowledge of the existence of climate change, which forms a requirement on whether personal norms will be triggered at all, as well whether efficacy beliefs are perceived (Stern, 2000; Steg & De Groot, 2019). It will subsequently influence the likelihood of proceeding to pro-environmental behaviour (Stern, 2000; Steg & De Groot, 2019).

Personal norms

Norms are generally explained as informal prescriptions on how one should behave or think and are triggered when climate change beliefs are addressed (Schwartz, 1977; Stern & Dietz, 1994). In turn, personal norms entail feelings of moral obligation or responsibility to either execute or resist specific actions. Widespread empirical evidence implies that a sense of personal obligation plays a crucial part in turning climate change beliefs into action (Stern, 2000; Steg & De Groot, 2019).

The VBN-model implies that environmental values and climate change beliefs will only be translated into action once people feel obliged to act (Stern, 2000; Schwartz 1977). Alternatively stated, norms related to climate change and pro-environmental behaviour strongly predict pro-environmental behaviour itself (Steg & De Groot, 2019; Stern, 2000; Schwartz, 1977).

Personal efficacy

Personal norms are activated when people have certain climate change beliefs, influenced by their value orientations, resulting in feeling responsible and obliged for acting pro-environmentally. Even so, research shows that people do not only need to feel obliged and responsible (personal norms), but also need a feeling of being able to act pro-environmental. This feeling of being able, or the belief of effectiveness of a certain action, is called efficacy (Lubell, 2002; Stern, 2000; Steg & de Groot, 2019). Therefore, norms and efficacy together form a condition for the transition to pro-environmental behaviour.

Specific personal efficacy indicates the belief that personal actions make a difference for an individual or collective goal, dividing further into 'self-efficacy' (one can perform behaviour that is perceived to be needed) and 'personal outcome efficacy' (this behaviour makes a difference in reducing environmental problems or climate change) (Bandura, 2010; Lubell, 2002).

Although the importance of personal efficacy beliefs in relation to the establishment of pro-environmental behaviour has been extensively examined (e.g. Stern, 2000; Steg & De Groot, 2012; Steg, Dreijerink & Abrahamse, 2005), the original VBN-model does not include efficacy beliefs as a standalone factor. Because efficacy is evidently closely related to personal

norms, the VBN-model in this research included efficacy as if it is part of the original model (Figure 1).

Collective influences in a psychological model

At this point, all originally considered factors of the model – including personal efficacy – are discussed. However, this research proposes complementation of social factors to the model, as explained previously, since the behaviour of individuals can (almost) never be solely explained by intrapersonal processes. Although no adjustments of the model were made in the past – as far as acquainted at this point – some initiatives of highlighting the importance of social factors were taken in contemporary literature on explaining the establishment of pro-environmental behaviour. It is stated, for example, that group memberships can influence the environmental attitudes and behaviour of an individual (Fielding & Hornsey, 2016).

The importance of this social environment in relation to the establishment of people's behaviour, is – as mentioned before – for example indicated by the 'social identity theory' (Tajfel, 1979; Turner & Tajfel, 1986) and the 'social integration theory' of Durkheim (Tubergen, 2019). The social identity theory explains that peoples' perception of who they are, relies on the social groups they belong to. Therefore, the identity of the group is important; people tend to behave in ways that are in line with the norms of the social group they are part of (Tajfel, 1979; Turner & Tajfel, 1986). The norms of social constructs are of great importance to the personal norms of people, and shapes their behaviour.

The social transmission hypothesis suggests a similar idea, arguing that the social environment of people affect how they think and how they behave. It poses that values, beliefs and corresponding behaviour of a persons' social environment, is transferred to the individual (Tubergen, 2019). This concept fits the larger idea of Durkheim that the values, beliefs and norms of people form a shared way of behaving and understanding. This shared construct, Durkheim poses, is what unites individuals and creates social integration (Tubergen, 2019).

Ultimately, the social environment influences the personal values, beliefs, norms and behaviour of individuals, reasoning from the above-stated theories.

Although up until this point, the term "social" has been used for discussing societal concepts, from now on the term "collective" will be used as well. This term includes not only

social groups, but also more abstract tendencies in society, that for example result in the rise of the offer in vegetarian food or the increase of using re-usable plastic products.

Collective norms

In order to fully understand the key position norms have in turning environmental values and climate change beliefs to action, one thus must be aware of the social environment of people. Therefore, collective norms are – next to personal norms – important to take in consideration and should be included in the VBN-model. Collective norms entail "rules and standards that are understood by members of a group, and that guide and/or constrain human behaviour without the force of laws" (Cialdini & Trost, 1998, p. 152). They thus refer to what others think or do, separating collective norms from personal norms, which solely focus on own behaviour. This implies that when people belong to a certain group and are exposed to the social norms of that group, they will internalise these norms (Tubergen, 2019). Collective norms tend to limit the extent to which people act egoistically, in favour of the importance of collective behaviour, such as pro-environmental activities (Biel & Thøgersen, 2007). Furthermore, the closer members of a social group (whatever kind or size), the more they will live up to the norms of that group (Tubergen, 2019).

Collective efficacy

Although the importance of personal efficacy beliefs in relation to pro-environmental behaviour has been extensively examined (e.g. Steg & De Groot, 2012), not much research has been done on the relevance of collective efficacy beliefs. An interesting gap, since collective efficacy implies the belief that other people will contribute to reducing environmental problems too. It furthermore expects that this contributing will be effective in solving climate change-related problems (Koletsou & Mancy, 2011; Lubell, 2002). It seems important that people believe in others' ability to solve problems caused by climate change. This is especially true for climate change, because it entails such a large-scale problem, that it is of vital importance to believe others act (as well) and will do so effectively. A logical consequence would be that collective efficacy will therefore influence personal norms and efficacy.

Empirical research question

As explained above, individuals do not solely behave in an individual vacuum, but stand in constant relation towards their social context. Referring to the importance of values, beliefs and norms to establish pro-environmental behaviour, the integration theory and the social transmission hypothesis state that these specific factors are influenced by the social environment of individuals.

This research, therefore, states that collective factors have to be incorporated in the VBN-model. Accordingly, the main research question is: "*To what extent do collective factors affect the establishment of pro-environmental behaviour within the framework of the Value-Norm-Belief model" (**MQ**)*.

Considering this quite explorative question, two sub-questions are proposed, with corresponding hypotheses. All hypotheses will be empirically tested subsequently. The first question is "*How do the collective factors (collective norms and collective efficacy) relate to other predicting factors in the VBN-model?" (**Q1**).* Assuming that the collective factors included in the model are situated on the same level as the personal efficacy and behaviour (see Figure 1), the following is expected. Firstly, it is expected that the collective factors positively relate to personal norms and efficacy (**H1**). This expectation is in line with the earlier mentioned theories of integration, social identity and social transmission. In line with these theories, it is furthermore expected that collective factors positively predict climate change beliefs (**H2**). Moreover, it is expected that collective factors moderate the relation between climate change beliefs and personal norms and efficacy (**H3**). Additionally, it is expected that collective norms and efficacy moderate for the relation between personal norms and efficacy and public-sphere behaviour (**H4**). More precisely, as mentioned previously, it could be argued that personal norms and efficacy indeed evoke pro-environmental behaviour, but specifically do so with (higher) collective norms and efficacy beliefs. Note that values are not included in this question and its hypotheses. Although the cited theory states that personal values can be affected by the social environment as well, they are more or less set from the age of twelve and stay quite stable afterwards, as mentioned before (Stern, 2000). Working with populations older than twelve, it is irrelevant to address the relation of collective factor to values empirically.

The second sub-question focuses on the sequential order of the original VBN-model, questioning: "*Does the incorporation of collective factors influence the one-directiveness of the VBN-model?" (**Q2**).* It is expected that with introducing collective factors, interactions between these factors and other factors in the model will embark. Consequently, H2 and H3 as proposed before, will also apply to this sub-question, for they presume relations contrary to the one-directed relations of the original VBN-model. They are expected to show the interactiveness of adding collective factors to solely personal factors, influencing each other. The causal chain as assumed by Stern (2000), is now mutually influenced and not solely one-directed anymore.

This research is additionally aiming to replicate the statistical findings of the original VBN-model of Stern. Firstly, for the purpose of checking whether the dataset that will be used to statistically test the VBN-model is indeed suitable to do so. Secondly, a few small adaptations are made in the model. Those entail either conceptual changes (e.g. introducing efficacy to the model), or are forced by the limits of working with existing data (focusing solely on public sphere behaviour). Three extra hypotheses are therefore proposed. Firstly, it is expected that each variable in the causal, stepwise chain is related to the next variable (**H5**). Moreover, each variable is also expected to be directly related to public-sphere behaviour (**H6**). Furthermore, these relationships are expected to get weaker the further away they are from public-sphere behaviour in the model (**H7**).

Research methods

Design. This study entails quantitative, non-experimental research making use of the data of the European Social Survey (ESS), round 8 (2016) and analyzing the data with the use of IBM SPSS Statistics 24. The research is of empirical nature, in order to verify whether a theoretically substantial idea, has power statistically as well. The ESS is a cross-national survey that measures attitudes, beliefs and behaviour on a wide range of topics of diverse populations in more than twenty countries. Its eighth round includes a module on climate change.

Participants & procedure. The population of this research is limited to Dutch citizens in order to guard the external validity (see Table 1). Even though numerous countries are included in the ESS, they are hard to compare on the climate change-related subjects as included in the

survey, for example because of difference in governance, national policies and societal movements. The Netherlands specifically deviate from the European average, such as having one the highest G.D.P.s and a high institutional trust on the one hand, and having one of the smallest shares in renewable energy and being the fifth highest in greenhouse gas emissions per inhabitant on the other hand (CBS, 2018).

Sampling. ESS samples are bound to strict random probability methods. Data of ESS are representative regarding social-demographic factors. The participants were reached through either phone conversations, letters or home visits. The surveys were conducted through face-to-face interviews with experienced and trained interviewers.

Data management. Since the research elaborates on existing and open access data, all data is already anonymized. Therefore, (in)direct identification is not possible. While working on this research, the data was saved on one device only and will be deleted three months after finishing the research. Back-ups will be made onto local servers secured by the University of Utrecht.

Table 1. *Sample characteristics Dutch participants ESS (round 8).*

Number of participants (N)	1681
Age	Min = 15; Max = 97
	M = 46.94; SD = 18.899
Gender	
Male	830 (49.4%)
Female	851 (50.6%)

Instruments. All items used originate from the ESS 2016. For an overview of all items and related questions, see Table 3[4]. All variables in this research are measured on a continuous scale.

Values. A selection of the human value scale was included in ESS, based on Schwartz (1992) and measured on a 6-point Likert scale (N=1677, M=4.233, SD=.515). Only those values that conceptually related to one of the four environmental values were selected and categorized accordingly. After executing a factor and reliability analysis on all values, it was decided to delete "Important to make own decisions and be free", related to egoistic values. The Cronbach's alpha went up to .481.

[4] The survey included options like "refusal", "no answer" and "don't know". These options are reported as missing.

Beliefs. Aiming at capturing people's climate change beliefs on existence, cause and impact are measured (N=1675, M=2.452, SD=.516) (see Table 3). Since the items were initially scaled differently, they were recoded to scales from 0 to 4 (see Table 2). For all the three items, 0 was scored by people who do not believe that climate change exists. Codes 55 and 66 originally both represented people who did not think climate change exists, that has been checked manually through the dataset. The factor analysis indicates one factor, the reliability analysis reported Cronbach's alpha of .566.

Table 2. *Recoding items for climate change beliefs*

Climate change beliefs	***Original coding***	***New coding***
Climate change reality	1 = Definitely changing 2 = Probably changing 3 = Probably not changing 4 = Definitely not changing	0 = Definitely changing 1 = Probably changing 2 = Probably not changing 3 = Definitely not changing
Climate change cause	1 = Entirely by natural processes 2 = Mainly by natural processes 3 = About equally by natural processes and human activity 4 = Mainly by human activity 5 = Entirely by human activity 55 = I don't climate change is happening 66 = Not applicable	0 = 55, 66 1 = Entirely by natural processes, mainly by natural processes 2 = About equally by natural processes and human activity 3 = Mainly by human activity, entirely by human activity
Climate change impact	0 = extremely bad *TO* 10 = extremely good	0 = 55, 66 1 = 6, 7, 8, 9, 10 2 = 5 3 = 0 , 1, 2 3, 4

Norms and efficacy. Although norms and efficacy are not separately mentioned in any of the hypotheses, it was decided to keep treating them as two separate variables in the statistical analysis as well, given that they vary too much content-wise. Personal norms (N=1648, M=5.82, SD=2.318), collective norms (N=1639, M=4.350, SD=1.847) and collective efficacy (N=1635, M=5.590, SD=2.165) are measured on a 11-point Likert scale. Personal efficacy is measured by "self-efficacy" and "personal outcome expectancy", on an 11-point Likert scale (N=1642, M=5.369, SD=1.857), with a Cronbach's alpha of .159. See Table 3 for the exact items.

Pro-environmental behaviour. This variable is measured through "public-sphere behaviour" – divided in 'activist behaviour' and 'non-activist behaviour' – due to the fact that data on private-sphere behaviour is absent in the ESS combined with the scientific relevance for researching public-sphere behaviour, as mentioned before. Activist behaviour is measured by three items, based on their non-political characteristics (N=1681, M=1.165, SD=.232). Remaining items were left out in order to protect the validity of the scale; those were

containing items on explicit engagement in politics. Although the scale is originally substantively unrelated to pro-environmental behaviour, the questions were asked in between other climate change-related questions. Due to that context, it is assumed that participants answered these questions in relation to their perception of climate change. Putting the items into a scale, the dichotomous answer categories transformed into a continuous scale. A reliability analysis reported a Cronbach's alpha of .323. For non-activist behaviour, all three items were used on a 5-point Likert scale, with a Cronbach's alpha of .518 (N=1673, M=3.512, SD=.817).

Consulting the factor analysis, two obviously separate constructs were indicated, which was – next to the different definitions content-wise – the deciding factor of keeping the two sorts of behaviour apart from each other.

Analysis. *Data preparation.* First, descriptives were requested, searching for possible deviating data. The data was weighted by post-stratification weight including design weight, provided by ESS. Items were recoded in such a way that the higher the number, the higher the representation of the construct. Factor analyses were executed for all scales consisting of two or more items. Reliability tests were performed. Generally, the Cronbach's alpha of the scales is varying from very low to medium. The set benchmark of reliable scales ($\alpha > .7$), was never met. This should be considered when interpreting the outcomes. All scales were computed at this point.

Assumptions. Before interpreting any regression analyses, statistical assumptions were tested on violations. Assumptions of normality, linearity and homoscedasticity were generally met, except for 'activist pro-environmental behaviour'. This should be taken in consideration when interpreting the outcomes. Mahalanobis distance did not exceed the critical χ^2 for $df > 1000$ (at $\alpha = .05$) of 1074.68 for any cases in the data, so multivariate outliers are of no concern. Additionally, no Cook's distances higher than .02 were reported. All analyses were controlled for gender (dummy-coded: 0 = male, 1 = female) and age (see Table 1 for descriptives), considering research shows that older people tend to act more pro-environmental than younger people (Gilg, Barr & Ford, 2005) and women are more willing to change their behaviour in favour of the climate and are more emotionally involved with the environment than men (Kollmuss & Agyeman, 2002).

Regression. Multiple regression has been conducted in order to test H1, H2, H5 and H6. Stepwise, or hierarchical, multiple regressions were executed in order to test H7.

Moderation analyses were executed through introducing interaction-variables to the stepwise multiple regression, testing H3 and H4.

Table 3. *Items per construct retrieved from ESS (wave 2016).*

Construct		Item	Measurement
Values			
	Hedonistic		
		- Important to have a good time - Important to seek fun and things that give pleasure	
	Egoistic	- Important to be rich, have money and expensive things - Important to make own decisions and be free - Important to be successful and that people recognize achievements	1 = Very much like me 2 = Like me 3 = Somewhat like me 4 = A little like me 5 = Not like me 6 = Not like me at all
	Altruistic	- Important that people are treated equally and have equal opportunities - Important to help people and care for others well-being	
	Biospheric	- Important to care for nature and environment	
Climate change beliefs			
	Climate change reality	- Do you think the worlds' climate is changing?	1 = Definitely changing 2 = Probably changing 3 = Probably not changing 4 = Definitely not changing
	Climate change cause	- Do you think that climate change is caused by natural processes, human activity, or both?	1 = Entirely by natural processes 2 = Mainly by natural processes 3 = About equally by natural processes and human activity 4 = Mainly by human activity 5 = Entirely by human activity
	Climate change impact	- How good or bad do you think the impact of climate change will be on people across the world?	0 = extremely bad *TO* 10 = extremely good
Norms			
	Personal	- To what extent do you feel a personal responsibility to try to reduce climate change?	0 = Not at all *TO* 10 = A great deal
	Collective	- How likely do you think it is that large numbers of people will actually limit their energy use to try to reduce climate change?	0 = Not at all likely *TO* 10 = Extremely likely
Efficacy			
	Personal		
	Self-efficacy	- Overall, how confident are you that you could use less energy than you do now?	0 = Not at all confident *TO* 10 = Completely confident
	Personal outcome expectancy	- How likely do you think it is that limiting your own energy use would help reduce climate change?	0 = Not at all likely *TO* 10 = Extremely likely
	Collective	- How likely do you think it is that this would reduce climate change?	0 = Not at all likely *TO* 10 = Extremely likely
Pro-environmental behaviour = *public sphere behaviour*			
	Activist behaviour	- During the last 12 months, have you done any of the following? Have you…	
		o … Signed a petition?	1 = Yes; 2 = No
		o … Taken part in a lawful public demonstration?	1 = Yes; 2 = No
		o … Boycotted certain products?	1 = Yes; 2 = No
	Non-activist behaviour	- To what extent are you in favour or against the following policies in the Netherlands to reduce climate change?	
		o Increasing taxes on fossil fuels, such as oil, gas and coal.	1 = Strongly in favour 2 = Somewhat in favour 3 = Neither in favour nor against 4 = Somewhat against 5 = Strongly against
		o Using public money to subsidise renewable energy such as wind and solar power.	
		o A law banning the sale of the least energy efficient household appliances.	

Results

To be able to test whether the proposed addition of collective factors shape the establishment of pro-environmental behaviour within the framework of the VBN-model, it is important to see how the model reacts to the data that has been used for this research[5].

To start with, each variable in the supposable causal chain of the VBN-model predicts the next variable, with one exception. Therefore, these outcomes are almost in line with H5. Environmental values predict beliefs (F (1, 1622) = 28.219, $p < .001$, $R^2 = .130$). In turn, climate change beliefs predict both personal norms, (F (1, 1645)=141.009, $p < .000$, $R^2=.079$) and personal efficacy (F (1, 1672)=9.007, $p < .000$, $R^2=.003$). Personal norms predict both activist behaviour and non-activist behaviour, personal efficacy only predict non-activist behaviour (see Table 4).

Table 4. *Regression of personal norms and efficacy on activist pro-environmental behaviour and non-activist pro-environmental behaviour*

Variable	**Activist pro-environmental behaviour**				**Non-activist pro-environmental behaviour**			
	B [95% CI]	β	t	Sr^2	*B* [95% CI]	β	t	Sr^2
Personal norms	.011 [.006, .017]**	.113	4.377	.001	.123 [.106, .139]**	.350	14.571	.104
Personal efficacy	.004 [-.002, .011]	.032	1.221	.011	.040 [.019, .061]**	.090	3.722	.007

Note. CI = confidence interval. * *p <.05, ** p <.001.* Activist public-sphere behaviour: R^2=.023, Non-activist public-sphere behaviour: R^2 =.157.

All other factors of the original VBN-model (alongside personal norms and personal efficacy, as they were demonstrated in table 4), are moreover directly related to both kinds of public-sphere behaviour (see Table 5), in accordance with H6.

In addition, Table 7 shows that these direct relations towards public-sphere behaviour get slightly weaker when adding more factors to the statistical model, as was expected by H7.

Table 5. *Regression of the original factors in the VBN-model, directly related to activist pro-environmental behaviour*

Variable	**Activist pro-environmental behaviour**				**Non-activist pro-environmental behaviour**			
	B [95% CI]	β	t	R^2	*B* [95% CI]	β	t	R^2
Environmental values	.038 [.016, .059]*	.083	3.403	.007	.219 [.143, .294]**	.138	5.684	.019
Climate change beliefs	.041 [.019, .062]**	.090	3.698	.008	.408 [.335, .480]**	.260	11.009	.068

Note. CI = confidence interval. * *p < .05, ** p < .001.*

[5] In contrast to what seem logical, the result-section starts with the last posed hypotheses (H5, H6, H7). These hypotheses "check" the original VBN-model and were therefore introduced lastly in text. After all, they do not entail the most important question of this research.

Considering the hypotheses that were set up relating collective factors to the VBN-model, collective factors do positively relate to personal norms and efficacy (see Figure 2), even if influenced by other factors as well (see Table 8), meeting the expectations of H1.

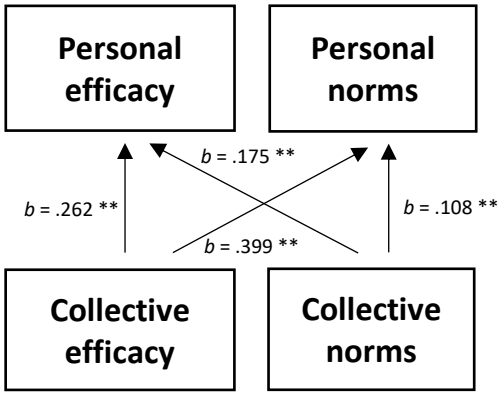

Figure 2. Regression coefficients on collective factors to personal norms and efficacy.
** p < .05, ** p < .001.*

Furthermore, collective factors predict climate change beliefs (F (4, 1627)=48.859, p < .001, R^2=.107) in line with H2, although the output indicates a negative relation that is unexpected: when collective norms increase with "1", climate change beliefs will decrease with -.039 (see Table 6).

Moreover, no moderating effects of collective factors on the relation between climate change beliefs and personal norms and efficacy were found, as demonstrated by Table 8. This rejects H3, since the moderations were expected to be found.

In addition, it was expected that collective norms and efficacy moderate for the relation between personal norms and efficacy and public-sphere behaviour (H4). Two moderation effects were reported: collective norms moderating the relation between personal efficacy and activist behaviour and collective efficacy moderating the relation between personal norms and activist behaviour (Table 9). No moderation effects were reported on non-activist behaviour. Although not formulated in hypothesis, collective efficacy predicts both types of behaviour directly (Table 9).

Table 6. Regression of the effect of collective norms and efficacy on climate change beliefs

Variable	*B* [95% CI]	β	Sr^2
Collective efficacy	.053 [.043, .063]**	.260	.068
Collective norms	-.039 [-.051, -.028]**	-.187	.033

Note. N = 1631. CI = confidence interval.
** p < .05, ** p < .001.*

Concerning the controlling variables, gender was only twice significantly reported in an analysis. Age influence the analyses more often, however, the intercepts of these effects are very small; the effects age have in practice will be small. All effect sizes reported (R^2) were small to medium[6], something to take in consideration.

[6] An $R^2 \approx .0196$ is considered small, an $R^2 \approx .13$ is medium, an and an $R^2 \approx .26$ is large.

Table 7. *Unstandardized (B), standardized (β) coefficients and t-values. Predicting 'Activist public-sphere behaviour' and 'Non-activist public-sphere behaviour' according to the original VBN-factors, including controlling variables 'age' and 'gender'.*

Variable	*Activist public-sphere behaviour*			*Non-activist public-sphere behaviour*		
	B [95% CI]	β	t	*B* [95% CI]	β	t
Step 1						
Environmental values	.041 [.903, 1.089]**	.089	3.636	.221 [.146, .296]**	.141	5.762
Step 2						
Environmental values	.036 [.014, .058]*	.079	3.179	.167 [.094, .240]**	.106	4.483
Climate change beliefs	.045 [.019, .070]*	.085	3.450	.494 [.409, .578]**	.279	11.426
Step 3						
Environmental values	.028 [.006, .050]*	.061	2.452	.082 [.012, .152]*	.052	2.294
Climate change beliefs	.032 [.005, .058]*	.060	2.361	.342 [.259, .425]**	.188	8.095
Personal efficacy	.004 [-.002, .011]	.034	1.326	.037 [.017, .058]**	.084	3.542
Personal norms	.009 [.003, .014]**	.086	3.195	.103 [.087, .120]**	.295	12.052
Step 4						
Environmental values	.025 [.002, .047]*	.054	2.135	.098 [.027, .169]**	.069	2.705
Climate change beliefs	.027 [.001, .054]*	.052	1.999	.359 [.275, .443]**	.197	8.390
Personal efficacy	.004 [-.003, .010]	.029	1.108	.039 [.018, .060]**	.087	3.698
Personal norms	.009 [.004, .014]*	.090	3.195	.100 [.083, .117]**	.286	11.600
Gender	.022 [-.001, .044]	.047	1.906	.090 [.020, .161]*	.052	2.506
Age	-.001[-.001, .000]	-.047	-1.844	.002 [.000, .004]*	.052	2.244

Note. CI = confidence interval.

Activist public-sphere behaviour applies R^2= .008 Step 1 (p < .001); ΔR^2 = .007 Step 2 (p < .05); ΔR^2 = .009 Step 3 (p < .001).

Non-activist public-sphere behaviour applies R^2= .020 Step 1 (p < 001; ΔR^2 = .072 Step 2 (p < .001); ΔR^2 = .099 Step 3 (p < .001).

** p < .05, ** p < .001*

Table 8. *Unstandardized (B), standardized (*β) *coefficients and t-values. Predicting 'Personal norms' and 'Personal efficacy', including controlling variables 'age' and 'gender'.*

	Personal Norms			*Personal Efficacy*		
Variable	*B* [95% CI]	β	t	*B* [95% CI]	β	t
Step 1						
Environmental values	.799 [.585, 1.013}**	.179	7.328	.527 [.357, .698]**	.149	6.073
Step 2						
Environmental values	.650 [.441, .858]**	.146	6.113	.491 [.320, .662]**	.139	5.621
Climate change beliefs	1.325 [1.083, 1.568]**	.256	10.730	.321 [.122, .520]*	.078	3.160
Step 3						
Environmental values	.414 [.217, .611]**	.093	4.124	.297 [.136, .458]**	.084	3.612
Climate change beliefs	1.095 [.860, 1.331]**	.211	9.125	.189 [-.004, .382]	.046	1.919
Collective efficacy	.321 [.272, .370]**	.302	12.789	.239 [.199, .279]**	.283	11.641
Collective norms	.155 [.099, .211]**	.124	5.406	.181 [.135, .227]**	.184	7.738
Step 4						
Environmental values	.147 [.220, .614]*	.093	4.151	.297 [.136, .459]**	.084	2.035
Climate change beliefs	1.632 [.913, 2.351]	.315	4.455	.610 [.022, 1.199]*	.148	2.035
Collective efficacy	.475 [.227, .722]**	.446	3.755	.249 [.046, .452]*	.296	2.408
Collective norms	.268 [-.038, .574]	.215	1.717	.401 [.150, .651]*	.406	3.138
Collective efficacy * climate change beliefs	-.062 [-.161, .036]	-.173	-1.241	-.004 [-.085, .076]	-.015	-.105
Collective norms * climate change beliefs	-.046 [-.169, .076]	-.096	-.740	-.089 [-.189, .011]	-.234	-1.749
Step 5						
Environmental values	.475 [.275, .675]**	.106	4.664	.230 [.067, .393]*	.065	2.769
Climate change beliefs	1.719 [.999, 2.438]**	.331	4.687	.505 [-.082, 1.092]	.123	1.687
Collective efficacy	.452 [.204, .700]**	.425	3.578	.273 [.071, .476]*	.325	2.651
Collective norms	.297 [-.009, .603]	.239	1.905	.365 [.116, .615]*	.370	2.871
Collective efficacy * climate change beliefs	-.055 [-.153, .044]	-.152	-1.090	-.013 [-.093, .068]	-.045	-.313
Collective norms * climate change beliefs	-.063 [-.185, .060]	-.130	-1.005	-.070 [-.170, .030]	-.182	-1.365
Gender	.058 [-.141, 257]	.013	.571	-.010 [-.173, .152]	-.003	-.125
Age	.009 [.003, .014]**	.071	3.079	-.010 [-.015, -.006]**	-.105	-4.451

Note. CI = confidence interval.

Personal norms apply R^2=.032 Step 1 (*p*<.001); ΔR^2=.064 Step 2 (*p*<.001); ΔR^2 =.117 Step 3 (*p*<.001); ΔR^2=.001 Step 4 (*p*=.281); ΔR^2 =.005 Step 5 (*p<.05)*.

Personal efficacy apply R^2=.022 Step 1 (*p*<.001; ΔR^2=.006 Step 2 (*p*<.05); ΔR^2 =.132 Step 3 (*p*<.001); ΔR^2=.002 Step 4 (*p*=.196); ΔR^2=.010 Step 5 (*p<.001)*.

** p < .05, ** p < .001*

Table 9. *Unstandardized (B), standardized (*β*) coefficients and t-values. Predicting moderation effects of collective norms and efficacy on the relation between personal norms and efficacy and public-sphere behaviour, including controlling variables 'age' and 'gender'.* [7]

Variable	*Activist public-sphere behaviour*			*Non-activist public-sphere behaviour*		
	B [95% CI]	β	t	*B* [95% CI]	β	t
Step 1						
Personal efficacy	.005 [.012, .074]	.039	1.519	.043 [.022, .064]**	.096	3.993
Personal norm	.011 [.016, .120]**	.107	4.122	.126 [.109, .142]**	.356	14.821
Step 2	…	…	…	…	…	…
….	…	…	…	…	…	…
Step 3	…	…	…	…	…	…
Step 4						
Personal efficacy	.024 [.002, .046]*	.187	2.185	.077 [.008, .146]*	.174	2.195
Personal norm	-.003 [-.017, .012]	-.026	-.349	.109 [.062, .157]**	.310	4.538
Collective efficacy	-.021 [-.037, -.004]*	-.190	-2.478	.064 [.012, .116]*	.171	2.406
Collective norm	.015 [-.004, .034]	.120	1.593	.013 [-.046,.073]	.031	.441
Personal norm*collective norm	.000 [-.003, .002]	-.014	-1.62	-.005 [-.013, .003]	-.107	-1.329
Personal norm*collective efficacy	.003 [.001, .005]*	.281	3.146	.005 [-.002, .011]	.118	1.430
Personal efficacy*collective norm	-.004 [-.007, .000]*	-.235	-2.244	.000 [-.010, .011]	.006	.066
Personal efficacy*collective efficacy	.000 [-.003, .003]	-.013	-.109	-.008 [-.017, .001]	-.178	-1.678
Gender	.023 [.001, .046]*	.050	2.023	.070 [-.002, .143]	.044	1.912
Age	-.001 [-.001, .000]	-.051	-2.034	.000 [-.002, .002]	.008	.334

Note. CI = confidence interval.

Activist public-sphere behaviour apply R^2=.016 Step 1 (p<.001); ΔR^2=.003 Step 2 (p=.075); ΔR^2 =.010 Step 3 (p<.05); ΔR^2=.005 Step 4 (p< .05).

Non-activist public-sphere behaviour apply R^2=.158 Step 1 (p<.001; ΔR^2=.014 Step 2 (p<.001); ΔR^2 =.003 Step 3 (p=.226); ΔR^2=.002 Step 4 (p=.151).

** p < .05, ** p < .001*

[7] Only one step is important for statistical model (step 4), since for this hypothesis, only the interaction effects need to be obtained. Therefore, the steps in between were left intentionally left blank, in order to create more overview. ΔR^2 are reported (Table 9).

Discussion

Conclusion. This article presented an adjusted version of the original VBN-model, introducing collective factors to the model. This adjustment responds to the note that the original model solely focuses on intrapersonal factors playing a role in the establishment of pro-environmental behaviour, overlooking the effect that the social environment might have on this establishment as well. Empirically, it was therefore relevant to question whether and to what extent collective factors affect the establishment of pro-environmental behaviour within the existing framework of the VBN-model.

Statistic results show that collective factors (collective norms and collective efficacy) predict the original predicting factors in the VBN-model. In line with theory previously mentioned, these results indicate that the social environment does not only influence values, beliefs and norms generally. It also influences climate change beliefs and personal norms and efficacy specifically[8]. Collective factors therefore ultimately affect the establishment of public-sphere pro-environmental behaviour. In addition to these findings, one relation stands out when taking a closer look; collective norms correlate negatively to climate change beliefs. In other words, the higher the representation of climate-related collective norms, the lower the representation of climate change beliefs. No sensible explanation has yet been found for this. Further research may offer clarification. Moreover, collective efficacy beliefs seem to relate to public-sphere behaviour directly. Believing in others' ability to solve problems caused by climate change, appear to be important in order to behave pro-environmentally, which seem reasonable to expect. Since no specific hypotheses were made up to test this effect, more research on this might further clarify the relation.

Additionally, not only direct effects of collective factors on predicting factors of pro-environmental behaviour were expected. Moderating effects on the relation between climate change beliefs and personal norms and personal efficacy by the collective factors were expected, but not identified. No theoretical explanation for these outcomes appeared. When looking at the statistical model (Table 8), significant relations fade out when interaction effects are introduced. Possibly, there is an empirical explanation for the absence of moderation effects. Follow-up research on this is recommended. In contrast, in two cases moderation

[8] Environmental values were not actively empirically included in this research, due to earlier mentioned reasons of theoretical irrelevance of testing this. Follow-up research could include this construct when deemed desirable for empirical reasons.

effects by collective factors were determined on the relation between personal norms and efficacy and activist public-sphere behaviour (see Table 9). Therefore, it could be argued that personal norms and efficacy indeed evoke pro-environmental behaviour, but specifically do so with when collective norms and efficacy beliefs play their part. No moderation effects were found for non-activist public sphere behaviour. There is no clear-cut reason for this division, but might have something to do with the visibility of activist behaviour in relation to non-activist activist behaviour.

Regarding the influence that social factors have on the VBN-model, it should be furthermore noted that, in line with the expectations, the results as outlined above, affect the one-directiveness of the model. This was shown by the fact that believes are influenced by collective factors. These affected beliefs could in turn influence personal norms and personal efficacy, which will ultimately lead to pro-environmental behaviour. This shows that with the incorporation of collective effects, mutual effects arise that partly eliminate the idea of a solely consecutive, causal chain of predictors, influencing the next predictor in line. Instead, predictors mutually affect each other as well. More research should be done on specific mutual relationships and effects in the VBN model.

Finally, it is worth mentioning the original VBN-model was successfully replicated; all presumed relations were reported significantly on the data of ESS. It clearly shows that all factors in the original model predict pro-environmental behaviour, as well as each factor relates to the next variable in line. It also appears as if public-sphere pro-environmental behaviour could be predicted by the VBN-model, in addition to the more commonly tested private-sphere behaviour. Only personal efficacy does not appear to predict activist behaviour. Possibly, for activist behaviour, it is less important if people think that certain behaviour is effective. Norms considering that behaviour may be more guiding. Overall, more research should be done on the role of efficacy in the VBN-model, since it is not part of the model officially.

Strengths. The nature of this research was theoretically rather profound, mapping different original and new concepts within the VBN-model and pro-environmental behaviour in general. It mostly entails new and explorative research, trying to add both empirically and theoretically to the fields of science related to the model and pro-environmental behaviour. Furthermore, this study tested the original VBN-model first, before proceeding to the newly put up hypotheses, making sure that the extensions to the model were tested on a model that

behaved in the way that was theoretically outlined, which is of great importance when interpreting the outcomes of the added factors.

Limitations. The downside of conducting such explorative research, is that the results can only be considered as a guideline that hints a certain direction. Indubitably, more research is needed to further validate the results from this study and specify and elaborate on them in a more nuanced way. Considering the data that has been used to carry out this research, the biggest constraining factor was that it involved existing data. Therefore, this explorative research was limited in its freedom to include all concepts that were considered meaningful. The instrument (ESS) and its corresponding scales and constructs put certain limitations on conducting the research. Norms and efficacy scales were measured by only one item, complicating determining the reliability. Furthermore, personal norms were content-wise only addressing responsibility, leaving feelings of obligations out. No concept was measuring collective norms, making the item that is used possibly not the most suitable. A scale specifically focusing on pro-environmental activist behaviour is desirable, being less dependent on the order in which the items in the questionnaire are conducted.

Recommendations. Next to the recommendations that were made throughout this chapter, a few general suggestions can be posed. First, the constructs and corresponding data offer much more options than has been performed in this research. Further research should not only repeat this study for the sake of general reliability, but could also add to this study easily. For example, other countries could be compared to the outcomes of this Dutch-sample research. It would be furthermore interesting zooming in to more detailed interplays between collective and personal factors in follow-up research. Moreover, this research focused solely on public-sphere behaviour. It would be interesting to see what happens when the revised model is tested on private-sphere behaviour as well. Lastly, future research could look into adding the concept of intention of behaviour (Ajzen, 1985). This encounters the idea that behaviour ultimately results from the intention of doing so, as stated for example by the 'theory of planned behaviour (Ajzen, 1985).

It is clear that climate change is a major problem with large-scale consequences. Since people are the main cause of that problem, they have to adjust their behaviour and start to act more pro-environmental. The Value-Belief-Norm model attempts to understand the establishment of this pro-environmental behaviour. This research tried to further improve the model by introducing the influence of the social environment to the originally solely

intrapersonal-focused processes. It resulted in a model that is slightly more complicated in its outlook, but presumably brings us one step closer to understanding the establishment of pro-environmental behaviour. After all, only when this establishment is well understood, appropriate and effective policies and interventions can be developed in order to make the next big step towards creating a healthy planet on which we ánd future generations can live happily and sustainably.

Bibliography

Ajzen, I. (1985). From intentions to actions: a theory of planned behavior. In: *Action-Control: From Cognition to Behavior (*ed. J. Kuhl and J. Beckman), 11–39. Heidelberg, Germany: Springer. https://doi.org/10.1007/978-3-642-69746-3_2

Bandura, A. (2010). Self-efficacy. *The Corsini encyclopedia of psychology*, 1-3. https://doi.org/10.1002/9780470479216.corpsy0836

Biel, A., & Thøgersen, J. (2007). Activation of social norms in social dilemmas: A review of the evidence and reflections on the implications for environmental behaviour. *Journal of economic psychology, 28*(1), 93-112. https://doi.org/10.1016/j.joep.2006.03.003

Capstick, S., Whitmarsh, L., Poortinga, W., Pidgeon, N., & Upham, P. (2015). International trends in public perceptions of climate change over the past quarter century. Wiley Interdisciplinary Reviews: Climate Change, 6(1), 35-61. https://doi.org/10.1002/wcc.321

CBS. (2018). Duurzame ontwikkelingsdoelen: de stand voor Nederland. *Centraal bureau voor statistiek.*

Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity and compliance. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (pp. 151-192). New York, NY, US: McGraw-Hill.

De Groot, J. I., & Steg, L. (2008). Value orientations to explain beliefs related to environmental significant behavior: How to measure egoistic, altruistic, and biospheric value orientations. *Environment and Behavior*, *40*(3), 330-354. https://doi.org/10.1177/0013916506297831

Dietz, T., Fitzgerald, A., & Shwom, R. (2005). Environmental values. *Annual Review of Environment and Resources*, *30*, 335-372. https://doi.org/10.1146/annurev.energy.30.050504.144444

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm: a revised NEP scale. *Journal of social issues*, *56*(3), 425-442. https://doi.org/10.1111/0022-4537.00176

Eerste Kamer der Staten-Generaal - Klimaatwet aangenomen door Eerste Kamer. (2019, May 28). Retrieved June 5, 2019, from

https://www.eerstekamer.nl/nieuws/20190528/klimaatwet_aangenomen_door_eerste

ESS Round 8: European Social Survey Round 8 Data (2016). Data file edition 2.1. NSD - Norwegian Centre for Research Data, Norway – Data Archive and distributor of ESS data for ESS ERIC. doi:10.21338/NSD-ESS8-2016.

Fielding, K. S., & Hornsey, M. J. (2016). A social identity analysis of climate change and environmental attitudes and behaviors: Insights and opportunities. *Frontiers in psychology*, *7*, 121. https://doi.org/10.3389/fpsyg.2016.00121

Gilg, A., Barr, S., & Ford, N. (2005). Green consumption or sustainable lifestyles? Identifying the sustainable consumer. Futures, 37, 481–504. doi:10.1016/j.futures.2004.10.016.

IPCC. (2013). *Climate Change 2013: The Physical Science Basis* (Working Group I Contribution to the IPCC Fifth Assessment Report, Summary for Policymakers, Genève: Intergovernmental Panel on Climate Change). Geraadpleegd op http://www.ipcc.ch/report/ar5/wg1/

Koletsou, A., & Mancy, R. (2011). Which efficacy constructs for large-scale social dilemma problems? Individual and collective forms of efficacy and outcome expectancies in the context of climate change mitigation. Risk Management, 13(4), 184-208. https://doi.org/10.1057/rm.2011.12

Kollmuss, A., & 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. https://doi.org/10.1080/13504620220145401

Ligtvoet, W., Bregman, A., van Dorland, R., Brinke, W. B. M., de Vos, R., Petersen, A. C., & Visser, H. (2015). *Klimaatverandering: samenvatting van het vijfde IPCC-assessment en* een vertaling naar Nederland. Planbureau voor de Leefomgeving. Geraadpleegd op http://www.pbl.nl/sites/default/files/cms/publicaties/PBL_KNMI_2015_Klimaatverandering_Samenvatting%20van%20het%20vijfde%20IPCC-assessment_1405.pdf

Lubell, M. (2002). Environmental Activism as Collective Action. Environment and Behavior, 34(4), 431–454. https://doi.org/10.1177/00116502034004002

McMichael, A. J., Woodruff, R. E., & Hales, S. (2006). Climate change and human health: present and future risks. The Lancet, 367(9513), 859-869. https://doi.org/10.1016/S0140-6736(06)68079-3

NOS. (2019, January 27). Grootste klimaatmars ooit in België trekt 70.000 mensen. Retrieved July 3, 2019, from https://nos.nl/artikel/2269344-grootste-klimaatmars-ooit-in-belgie-trekt-70-000-mensen.html

NOS. (2019b, March 10). Klimaatmars trekt ondanks regen zo'n 40.000 mensen. Retrieved June 20, 2019, from https://nos.nl/artikel/2275330-klimaatmars-trekt-ondanks-regen-zo-n-40-000-mensen.html

Putnam, R. D., Leonardi, R., & Nanetti, R. Y. (1994). *Making democracy work: Civic traditions in modern Italy*. Princeton university press.

Rogers, R.W. (1983). Cognitive and physiological processes in fear appeals and attitude change: a revised theory of protection motivation. In: *Social Psychophysiology: A Sourcebook* (ed. B.L. Cacioppo and R.E. Petty), 153–176. Guilford Press: London.

Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. In *Advances in experimental social psychology* (Vol. 25, pp. 1-65). Academic Press. https://doi.org/10.1016/S0065-2601(08)60281-6

Schwartz, S.H. (1977). Normative influences on altruism. In: Advances in Experimental Social Psychology, vol. 10 (ed. L. Berkowitz), 222–280. New York, NY: Academic Press. Influences. https://doi.org/10.1016/S0065-2601(08)60358-5

Schwartz, S.H. and Howard, J.A. (1981). A normative decision-making model of altruism. In: Altruism and Helping Behaviour: Social, Personality and Developmental Perspectives (ed. J.P. Rushton), 189–211. Hillsdale NJ: Erlbaum.

Steg, L. (2016). Values, norms, and intrinsic motivation to act proenvironmentally. *Annual Review of Environment and Resources*, *41*, 277-292. doi:10.1146/annurev-environ-110615-085947

Steg, L., & de Groot, J. I. (2012). Environmental values. In S.D. Clayton (Ed.), *The Oxford handbook of environmental and conservation psychology*. Oxford University Press. (pp.115-127). doi:10.1093/oxfordhb/9780199733026.013.0005

Steg, L., & de Groot, J. I. M. (2019). *Environmental Psychology: An Introduction*. Wiley-Blackwell.

Stern, P. C., & Dietz, T. (1994). The value basis of environmental concern. *Journal of Social Issues*, *50*(3), 65–84. https://doi.org/10.1111/j.1540-4560.1994.tb02420.x

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmental concern. *Human Ecology Review*, *6*, 81–97.

Steg, L., Dreijerink, L., & Abrahamse, W. (2005). Factors influencing the acceptability of energy policies: A test of VBN theory. Journal of environmental psychology, 25(4), 415-425. https://doi.org/10.1016/j.jenvp.2005.08.003

Stern, P. C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues, 56,* 407-424. https://doi.org/10.1111/0022-4537.00175

Tajfel, H. (1979). Individuals and groups in social psychology. *British Journal of Social and Clinical Psychology*, *18*(2), 183-190. https://doi.org/10.1111/j.2044-8260.1979.tb00324.x

Turner, J. C., & Tajfel, H. (1986). The social identity theory of intergroup behavior. Psychology of intergroup relations, 5, 7-24.

Van Tubergen, F. (2019). Introduction to Sociology. Bosa Roza, United States: Taylor & Fancis Inc. Book in preparation [publication date: 20 Dec 2019].