Global Environmental Change 23 (2013) 1028–1038

Contents lists available at SciVerse ScienceDirect

Global Environmental Change

journal homepage: www.elsevier.com/locate/gloenvcha

A comprehensive model of the psychology of environmental behaviour—A meta-analysis

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ARTICLE INFO

Article history:
Received 21 June 2012
Received in revised form 24 May 2013
Accepted 30 May 2013

Keywords:
Meta-analysis
Meta-analytic structural equation model (MASEM)
Environmental psychology
Theory of planned behaviour
Norm-activation-theory
Value-belief-norm-theory

ABSTRACT

To address global environmental challenges it is crucial to understand how humans make decisions about environmentally relevant behaviour, since a shift to alternative behaviours can make a relevant difference. This paper proposes a comprehensive model of determinants of individual environmentally relevant behaviour based on a combination of the most common theories in environmental psychology. The model is tested using a meta-analytical structural equation modelling approach based on a pool of 56 different data sets with a variety of target behaviours. The model is supported by the data. Intentions to act, perceived behavioural control and habits were identified as direct predictors of behaviour. Intentions are predicted by attitudes, personal and social norms, and perceived behavioural control. Personal norms are predicted by social norms, perceived behavioural control, awareness of consequences, ascription of responsibility, an ecological world view and self-transcendence values. Self-enhancement values have a negative impact on personal norms. Based on the model, interventions to change behaviour need not only to include attitude campaigns but also a focus on de-habitualizing behaviour, strengthening the social support and increasing self-efficacy by concrete information about how to act. Value based interventions have only an indirect effect.

1. Introduction

Humankind is facing a number of global environmental challenges, such as climate change, resource depletion, or biodiversity loss. To counter these challenges both international and interdisciplinary efforts have to be made. Undertakings such as trying to understand the key drivers and processes behind behaviour causing these challenges, predicting their development over time and eventually changing the system enough to mitigate negative outcomes are essential. Notwithstanding the important role of technological development and international and national policy making, the contribution of individual behaviour should not be underestimated. Hertwich (2005) argues that household behaviour is the strongest contributor to total energy use and carbon dioxide emissions in most developed countries, when direct energy consumption and indirect energy consumption embedded in consumed goods and services are taken into account. In an analysis of the carbon footprint of 73 nations Hertwich and Peters (2009) conclude that 72% of all carbon dioxide emissions worldwide are connected to household consumption with food, shelter and mobility as the most important subcategories. Tukker and Jansen (2006) confirm this conclusion and calculate that approximately 70% of all life-cycle impacts of products and services consumed by households fall into the categories of food, housing and transport.

Although individuals in households have varying degrees of freedom, Jungbluth et al. (2000) argue that they can have an important impact by changing their behaviour, in particular their food choices. The degree to which individual behavioural change can reduce the environmental impact depends on several aspects (Dietz et al., 2009): (a) the impact the behaviour has, (b) the number of people who perform the behaviour, and (c) the percentage of those people who are willing or able to change the behaviour, referred to as 'plasticity'. Dietz et al. (2009) estimated the potential impact of changing a list of behaviours on reducing carbon dioxide emissions in the US and came to the conclusion that the implementation of 17 relatively simple changes in behaviour would reduce the household related carbon dioxide emissions by approximately 20%, taking into account plasticities of behaviours. Dietz et al. (2009) argue that implementing such changes would not reduce well-being considerably. It therefore becomes crucial to acknowledge and accept that individual behaviour both significantly contributes to global environmental challenges and that individual behavioural change has the potential to reduce this impact significantly. Identifying the determinants of human environmental behaviour is pivotal. If we would like to change people's behaviour we need to understand what determines their actions and decisions. What makes some

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http://dx.doi.org/10.1016/j.gloenvcha.2013.05.014

people use a bike while others use a car? What makes some people invest in insulating their house while others do not? What makes some people eat beef and others become vegetarians?

Since the 1980s environmental psychology has made an important contribution to this debate by proposing and testing theories and models that aim to predict environmentally relevant behaviour and to identify entry points for interventions to change the respective behaviour. Jackson (2005) gives a very comprehensive summary of the models and approaches that environmental psychology has developed. However, different model schools developed in environmental psychology, which lead to a diversity of proposed models and a large variety of variables that are considered to have an impact on environmentally relevant behaviour. Both from a theoretical and a practical perspective it would be helpful to reduce the complexity of environmental psychological theory by integrating the most successful theories into a general theory which additionally includes assumptions about how the variables of the different models relate to each other across different model traditions. So far it is not entirely clear which of the model variables are central integrating variables, or which of those that are direct determinants of behaviour or those that have a mediated influence. Integrating the major models and theories into a comprehensive model that in turn could be used as a framework for identifying potentially relevant variables across behaviours and cultures is promising. It could potentially increase the impact that environmental psychology would have in the debate about mitigation of environmental problems. This is achievable by pointing out the variables that should be primary targets for interventions and additionally by elucidating which of the more distal variables may be used for achieving a change in variables proximal to behaviour. It would assist in identifying the key determinants of behaviour and indicating the barriers to behaviour change. However, this would require that such a model is sufficiently structurally robust to perform well, not only for specific behaviours of specific groups of people but also on a general level. Therefore, this paper proposes a comprehensive action determination model (CADM) of environmental behaviour and tests the model in a meta-analytical structural equation modelling approach (Viswesvaran and Ones, 1995) across a large variety of environmentally relevant behaviours.

2. Theoretical background

A literature study by Sopha (2011) that analyzed the theoretical foundation of the analyses of household related energy behaviour in a very broad sense (including behaviour related to indirect energy consumption) identified the *Theory of Planned Behaviour* (TPB, Ajzen, 1991), the *Norm-Activation-Theory* (NAT, Schwartz and Howard, 1981), and the *Value-Belief-Norm-Theory* (VBN, Stern, 2000) as the most commonly used theories in the environmental psychological domain. NAT and VBN are closely related, with the latter building on the main assumptions of the first and extending it. 39% of all studies used the TPB as theoretical framework, 15% the NAT, 15% the VBN and 13% combined variables from at least two of the theories, which means that more than four out of five papers found in that literature study used at least one of the three theories as a framework. Given the general support the theories receive in the literature, it seems reasonable to start an integrating approach with these precedent theories before identifying which additional constructs potentially need to be included. In the following sections the theories are first introduced separately before a point is made for introducing habits into action theories. Finally, an integrated model is proposed based on the variables and their relations as suggested by the theories.

2.1. The theory of planned behaviour

The TPB was proposed by Ajzen in the early 1990s as a general model of deliberate behaviour (Ajzen, 1991). Fig. 1 displays the predicting variables and their relations with each other as well as to behaviour. The central assumption is that behaviour is directly determined by the intention to perform this behaviour, which is the will to make an effort to demonstrate the behaviour in question. This intention in turn is determined by the attitude towards the behaviour, the subjective norms connected to the behaviour, and perceived behavioural control (Ajzen, 1991). Attitudes are the sum of all behavioural beliefs about a behaviour activated in a given situation. A belief is the expectation that showing a behaviour would result in a certain outcome, the likelihood that that happens and the evaluation to which degree such an outcome would be favourable. Attitudes are therefore a general measure of the favourability a behavioural alternative has for an individual. Subjective norms are the perceived expectations of relevant other people which behavioural alternative should be performed (in other words the social pressure) times the willingness to comply with that expectation. Finally, perceived behavioural control is a measure that captures to which degree people have the opportunity and ability to perform a certain behavioural alternative. According to the TPB, people perform a behaviour with positive environmental outcomes if they hold a positive attitude to them, if other people expect them to act in that way and support them in doing so, and if they perceive themselves as being able to implement their intentions. It is important to recognize that all three constructs are subjective representations, which means that the perceived control is not necessarily identical to the objective or actual control people have or that the subjective norm does not necessarily reflect what other people really expect. Perceived behavioural control can under certain conditions have an additional direct impact on behaviour, for example when conditions change, before the behaviour is performed. The TPB has been applied to environmental behaviour several times and its proposed structure has been supported by past analyses (e.g. Han et al., 2010; Heath and Gifford, 2002; Harland et al., 1999; Tonglet et al., 2004a,b). Although the theory of planned behaviour often receives strong empirical support, it has been criticized for underrepresenting the impact of morality on environmental behaviour and for its lack of prediction of repeated behaviour (e.g. in Klöckner and Blöbaum, 2010).

2.2. The norm-activation-theory

In contrast to the TPB which is essentially a general behaviour theory the NAT has initially been developed specifically for one type of behaviour, namely altruism and helping behaviour. Several interpretations of the NAT are used in environmental psychological research (see Klöckner, 2013, for a presentation and discussion of the three most common). The version presented here already

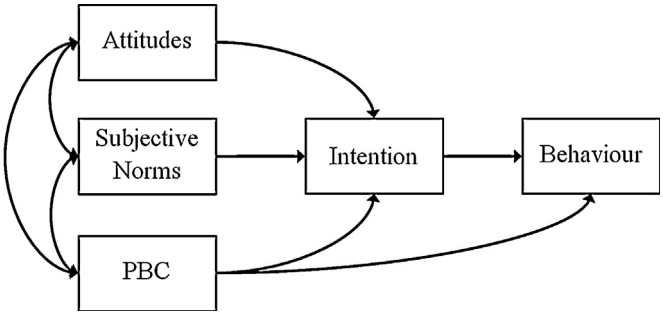

Fig. 1. The theory of planned behaviour (Ajzen, 1991, p. 182).