

**Nothing is as practical as a good theory,
Analysis of theories and a tool for developing interventions to influence
energy-related behaviour**

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1. Introduction	2
2. Behavioural change: a sketch.....	3
3. Theory of Planned Behaviour	4
4. Habitual Behaviour	5
5. Two approaches.....	6
6. Integration of perspectives	7
6.1 Stern’s Attitude-Behaviour-Context Model.....	7
6.2 Triandis’ Theory of Interpersonal Behaviour	8
6.3 The Motivation-Opportunity-Abilities model.....	9
7. Conclusions on theories	10
8. A tool for planning successful interventions.....	12
9. References	15

1. Introduction

In mitigating the human causes of global warming, the climate change policy of Europe, and many member states, is concerned with (1) developing and diffusing energy conservation technology, promoting renewables, and (2) influencing the behaviour of households and consumers. In order to improve policy interventions aimed at influencing the behaviour of households and consumers in a pro-environment direction, the European Commission, under the Intelligent Energy for Europe programme, decided to co-fund the project Behave. The aim of this project is to draw lessons from the evaluation of 40 energy behaviour projects from all over Europe, provide an overview of best practices, and provide guidelines on developing and implementing successful policy interventions aimed at consumers. The project team consists of 10 countries.

To provide knowledge of methods for behavioural change regarding energy, Work Package 2 of the Behave project consists of (1) an inventory of EU projects in the field of energy-related behaviour, and (2) an inventory and analysis of consumer-behaviour change methods and theories. This paper concerns the second task; it inventories and analyzes consumer-behaviour theories, providing a tool for developing interventions.

In the practice of behavioural change and from the inventory of EU projects, we see a lot of focus on awareness-raising campaigns and educational programmes. Awareness and knowledge are necessary, but often insufficient to induce behavioural change. Besides the focus on communicative instruments, we see attention paid to subsidies and labelling, but these instruments are often not connected to other instruments.

In this paper, we address the following questions. (1) From a theoretically point of view, what is the most appropriate way to influence the energy related behaviour of consumers and households? (2) What can be concluded for developing policy instruments? We answer these questions and discuss and provide an overview of the most important theories on pro-environmental consumer behaviour and behavioural change. We also discuss two opposite approaches on behaviour: Firstly, we can distinguish an approach that sees behaviour mainly as a function of *internal* factors. A second set of approaches sees behaviour

as a function *external* factors. The discussion of these approaches, combined with an overview of some integrated approaches, provides building blocks to develop, implement and evaluate interventions to influence the energy saving behaviour of individuals.

We start with a sketch of how behavioural change actually takes place (Section 2). In section 3, the most often used and documented theory is presented: the theory of Planned Behaviour. This theory is not only used often, but is criticized as well. We then describe (Section 4) a model of habitual behaviour and its relation to Planned Behaviour. In Section 5, we discuss two approaches towards behaviour: (1) behaviour is largely a product of factors *internal* to the individual (attitudes, values, habits and personal norms) and (2) behaviour is a product of *external* factors (fiscal and regulatory incentives, institutional constraints and social practices). Section 6 describes several integrated theories, each using a different set of factors that follow from the two main approaches described in Section 5. After our conclusions (Section 7), we recommend a planning model that incorporates our conclusions. This provides a protocol to develop interventions which in theory are the most effective (Section 8).

The description of the integrated theories is largely based on a review study of T. Jackson (2004), titled 'Motivating sustainable consumption' which includes many useful references.

2. Behavioural change: a sketch

Normally, the sequence of changes in an individual leading to behavioural change can be sketched in the following way (Steckler *et al.*, 2002). It begins when the individual becomes aware of a problem or need which gives the individual an initial reason or incentive to pursue a given course of action. This awareness is often raised by external forces. Sometimes experiences of peers raise the individual's awareness of a problem. Most of these problems or needs are routine, so most problems are solved in a routine way following standard actions (Cyert and March, 1992). This is what we call "habitual behaviour". And often there is hardly any awareness of the solving process, it simply occurs.

But if a problem is new or does not regularly occur, than a search for solutions starts. In this search for solutions, knowledge of alternatives is gathered and evaluated. The individual weighs the advantages and disadvantages of behavioural alternatives and makes a decision. Advantages and disadvantages (costs and benefits) are not only seen in terms of money, but also in terms of comfort, quality, image and perceived uncertainty. Values and norms also influence the assessments of advantages. This weighing of advantages and disadvantages leads to the forming of an attitude. An attitude is, thus, a form of evaluation directed towards a specific action or a situation and is cognitive, affective and normative in character. All the factors, awareness, knowledge, norms and values, and attitude, lead to an intention for making the decision to implement the solution. This intention may suffice to start the change in behaviour, but it will not be carried out unless the individual has the required resources and skills, and no barriers stand in the way.

Often such a change in behaviour is followed by an emotional, physical or social reaction towards the behaviour from the context. This feedback directly strengthens the behaviour. Rewards and positive feedback make the behaviour more attractive on the next occasion. The availability of resources also positively influences the factors motivating the behaviour. After establishing the new behaviour, the individual actively seeks for confirmation of his or her decision in feedback from peers or experts. So we see is that behaviour is a product of the individual and its environment.

3. Theory of Planned Behaviour

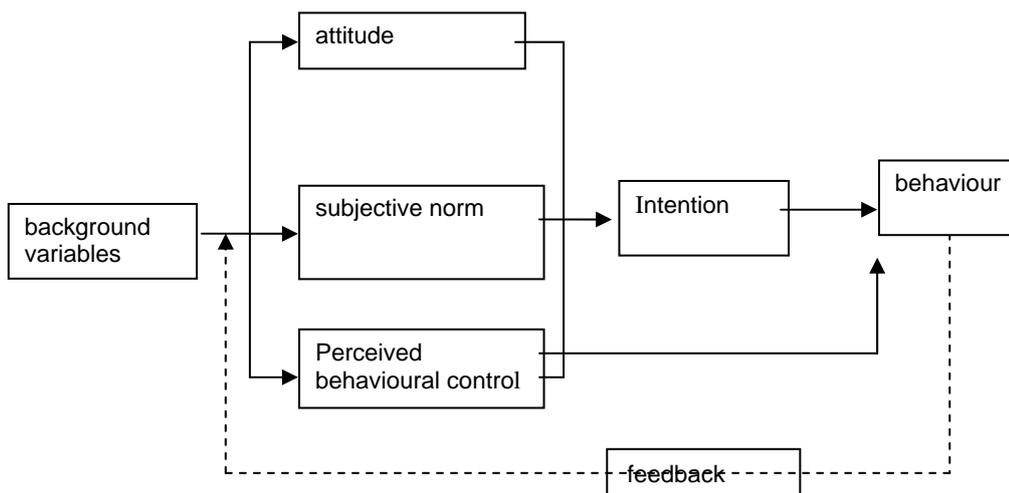
The theory of Planned Behaviour is one of the models most frequently used in the literature to explore pro-environmental behaviour including recycling, travel mode choice, energy consumption, water conservation, food choice, and ethical investment (Stern, 2000; Staats, 2003). Armitage and Conner (2001) identified its application in 154 different contexts. The Theory of Planned Behaviour (Ajzen, 1988) assumes that the best prediction of behaviour is given by asking people if they are intending to behave in a certain way. Here we note that the intention will not express itself in behaviour if it is physically impossible to perform the behaviour or if unexpected barriers stand in the way.

Assuming intention can explain behaviour, how can intention be explained?.

According to Ajzen, three determinants explain behavioural intention:

1. The attitude (opinions of oneself about the behaviour);
2. The subjective norm (opinions of others about the behaviour);
3. The perceived behavioural control (self-efficacy towards the behaviour).

Figure 1. The Theory of Planned Behaviour



According to the model attitudes, subjective norms and perceived behavioural control predict the intention, which in turn predicts the behaviour. Background variables, as demographical factors, are supposed to influence the behaviour through the three determinants and the intention. Attitudes, subjective norms and the perceived behavioural control, explain the behavioural intention before the behaviour takes place. The intention is a good predictor of the actual behaviour. Theory also says that the perceived behavioural control is an estimate of the skills needed for expressing the behaviour and the possibility to overcome barriers. Therefore, a direct influence of perceived behavioural control on behaviour is supposed. The actual behaviour leads to feedback about the expectations of the behaviour. In Figure 1, this is shown by the 'feedback' arrow.

Furthermore, Ajzen states that for a good and predictive value of the model, it is necessary that the several model variables are defined on the same level of specificity: For example, when investigating the explaining factors of buying solar boilers, prediction will not be found in the attitude toward the environment, but in the attitude toward solar boilers. If one

wants to study pro-environmental behaviour in general, than the determinants should be measured on this general level.

Comments on theory of Planned Behaviour

The model of the theory of Planned Behaviour assumes that consumers make decisions by calculating the costs and benefits of different courses of action and choosing the option that maximises their expected net benefits. The theory of Planned Behaviour belongs to the so-called group of 'rational choice models'. It builds on the following key assumptions:

- Individual self-interest is the appropriate framework for understanding human behaviour; rational behaviour is the result of processes of cognitive deliberation;
- Internal factors, especially the attitude, play the most important role.

The policy interventions that flow from this model are relatively straightforward. Policy should seek to ensure that consumers have access to sufficient information to make informed choices.

Though familiar and widely used, rational choice models have been subject to an extended critique. This critique is based on the following important claims and arguments.

- It is well known that human behaviour is extremely complex and consists of social, moral and altruistic behaviour as well as simply self-interested ones. More often, behaviour is embedded in collective and social decision-making contexts and other contextual factors. These factors continually shape and constrain individual preference.
- Habits and routines - which Simon (1957) referred to as procedural rationality - bypass cognitive deliberation and undermine a key assumption of the model.
- Emotional or affective responses appear to confound cognitive deliberation. It is well known in marketing theory, for example, that consumers build affective relationships with consumer goods.

In the next section, we will describe habitual behaviour and especially the relation to the Planned Behaviour.

4. Habitual Behaviour

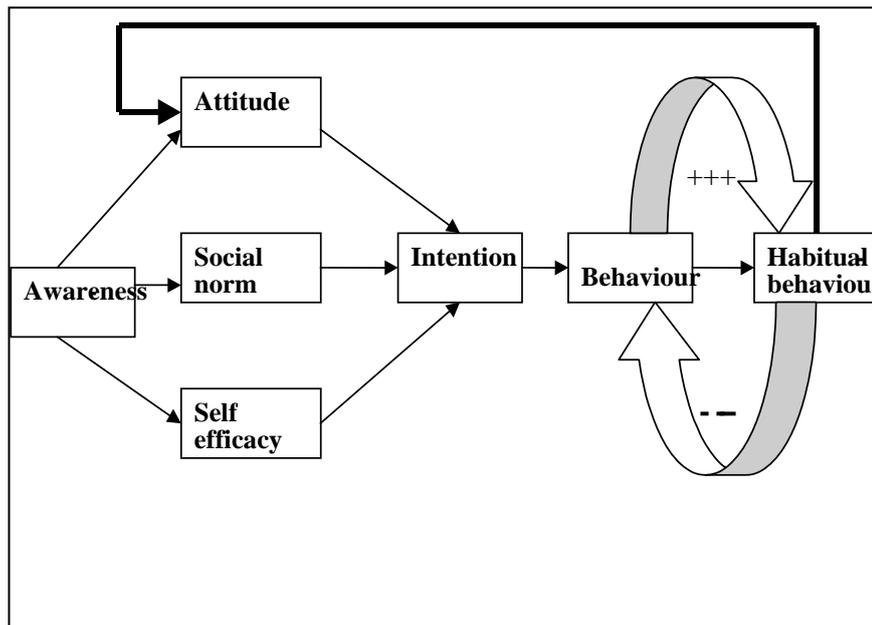
Habitual behaviour is a form of automatic and routine behaviour. It is behaviour that people repeat, because this behaviour is easy, comfortable or rewarding. It is efficient to do something by habit, and not to constantly reason with oneself about what is the best thing to do. The intrinsic advantages of the behaviour outweigh the possible disadvantages. 'Intrinsic' because, in the case of habitual behaviour, there is no constant weighing of pros and cons. Figure 2 shows the mechanism. The 'plusses' (at the right in the model) weigh against the 'minuses' and change the originally planned behaviour into a habit. Through repetition, a 'loop' and an automatism develop: reasoned weighing does not occur every time, but only when the loop is broken. The next example may clarify this: If someone takes the car to work every day, he does this because it is easy, comfortable and cheap. He gets in the car in front of his house, and gets out at the office; he plays his favourite music, and is not bothered by the weather. 'Weighing' has become intrinsic and implicit, and is not done every time he travels to the office. This probably will change, however, if fuel prices are doubled. The loop breaks because one of the initial reasons to take the car (cheap) no longer exists, and he becomes aware of that when filling the tank. He will now weigh the pros and cons again. See the backward arrow in the figure. And new behaviour - maybe a new habit - will begin..

Almost all behaviour (95% of household energy behaviour) is a form of habitual behaviour.(Wagenaar, 1992). In other words, to influence habitual household energy behaviour, break the habitual loop by:

- removing incentives that support the habitual behaviour;
- making consumers aware of their habitual behaviour, and;
- enabling them to avoid or control the negative outcomes and provide positive alternatives.

In this way we can learn, and teach, new desired habits.

Figure 2 Habitual behaviour



5. Two approaches

As we mentioned in Section 2, we follow the assumption that behaviour is a product of the individual and his or her context. Broadly speaking we see two identifiably different kinds of approaches to understanding consumer behaviour. One set of approaches studies and models behaviour mainly as a function of processes and characteristics which are conceived as being *internal* to the individual: attitudes, values, habits and personal norms. A second set studies behaviour as a function of processes and characteristics *external* to the individual: fiscal and regulatory incentives, institutional constraints and social practices. The first (‘internal’) perspective carries an implicit assumption of consumers as atomistic agents autonomous of social structure, while the second (‘external’) perspective sees consumers as constrained operators programmed (or at least heavily influenced) by external forces beyond their comprehension or control.

The literature on recycling is typical of this ‘divergence’ in perspectives. In particular, the early literature on recycling shows clear evidence of the division. Internal perspectives focus exclusively on attitudes, beliefs and intrinsic motivations as critical determinants of recycling actions. Externalist approaches concentrate solely on the role of external constraints, prompts, and incentives in promoting recycling behaviour.

Not surprisingly, the two perspectives tend to differ widely in their policy prescriptions. On the understanding that public attitudes are the most important determinants

of successful pro-environmental behaviour, the internal approach calls mainly for awareness raising, information provision and advertising campaigns to motivate pro-environmental attitudes. By contrast, the externalist approach tends to call for a combination of incentives and changes in the regulatory structure to create the right conditions for pro-environmental behaviour. Recent literature on recycling, for example, tends to adopt both approaches (Perrin and Barton 2001, Oates and McDonald 2004). But it does not always do so in a structured way. In particular, this literature often does not explore the relationships between internal factors and external constraints in any depth. In the next section, we briefly examine some of integrated models, which attempt to combine both internal and external perspectives.

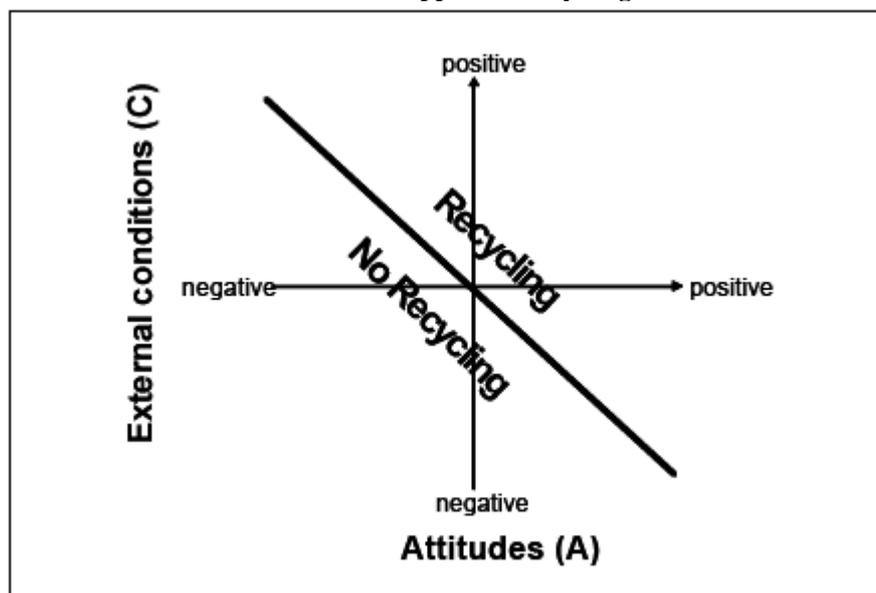
6. Integration of perspectives

The following integrated theories are described, the Attitude-Behaviour-Context (ABC) model; the theory of Interpersonal Behaviour; the Motivation-Opportunity-Ability (MOA) model. These models take internal and external factors into account.

6.1 Stern's Attitude-Behaviour-Context Model

One of the most significant efforts to overcome the internal-external dichotomy in the social psychological literature is the attempt by Stern (2000) and his colleagues (Guagnano *et al.*, 1995; Stern *et al.*, 1999) to develop integrated 'Attitude-Behaviour Context' (ABC) models of environmentally significant behaviour (Figure 3). The fundamental starting point for Stern's approach is the assumption that behaviour is a function of the organism and its environment. Or, in the language of ABC, behaviour (B) is 'an interactive product of personal sphere attitudinal variables (A) and contextual factors (C)' (Stern, 2000). Attitudinal variables considered in such theories might include a variety of specific personal beliefs, norms and values as well as general 'pre-dispositions' to act in certain ways. Contextual factors can potentially include a wide variety of influences such as: monetary incentives and costs, physical capabilities and constraints, institutional and legal factors, public policy support, interpersonal influences (social norms e.g.) and in some cases (Olli *et al.*, 1999) broader dimensions of the social context, such as allegiance to or influence by environmental groups.

Figure 3 the Attitude-Behaviour-Context Model applied to recycling



The structural dynamics between the influence of attitudes (i.e. internal factors) and contextual (i.e. external) factors is a key dimension of the ABC model. In particular, its proponents claim that the attitude-behaviour link is strongest when contextual factors are weak or non-existent; and that; conversely, there is virtually no link between attitudes and behaviours when contextual factors are either strongly negative or strongly positive. So, for example, in the case of recycling, when access to recycling facilities is either very hard or very easy, it scarcely matters whether or not people hold pro-recycling attitudes. In the first case, virtually no one recycles; and in the second case most people recycle. In a situation, however, in which it is possible but not necessarily easy to recycle, the correlation between pro-environmental attitude and recycling behaviour is strongest.

6.2 Triandis' Theory of Interpersonal Behaviour

If there is one key element in the social psychology of behaviour that is still missing from Stern's ABC model, it is the role of habit. Stern (2000) acknowledges this and proposes that an integrated model of environmentally significant behaviour would consist of four factors: 1) attitudes; 2) contextual factors; 3) personal capabilities; and 4) habits. The general thrust of Stern's suggestion is very similar to an attempt made almost thirty years ago by social psychologist Harry Triandis to develop an integrated model of 'interpersonal' behaviour. Triandis recognised the key role played by both social factors and emotions in forming intentions. He also highlighted the importance of past behaviour on the present. On the basis of these observations, Triandis proposed a Theory of Interpersonal Behaviour (Figure 4) in which intentions – as in many of the other models – are immediate antecedents of behaviour. But crucially, habits also mediate behaviour. And both these influences are moderated by facilitating conditions.

Behaviour in any situation is, according to Triandis, a function partly of the intention, partly of the habitual responses, and partly of the situational constraints and conditions. The intention is influenced by social and affective factors as well as by rational deliberations. One is neither fully deliberative, in Triandis' model, nor fully automatic. One is neither fully autonomous nor entirely social. Behaviour is influenced by moral beliefs, but the impact of these is moderated both by emotional drives and cognitive limitations.

Social factors include norms, roles and self-concept. Norms are the social rules about what should and should not be done. Roles are 'sets of behaviours that are considered appropriate for persons holding particular positions in a group' (Triandis, 1977). Self-concept refers to the idea that a person has of his/herself, the goals that it is appropriate for the person to pursue or to eschew, and the behaviours that the person does or does not engage in.

Emotional responses to a decision or to a decision situation are assumed distinct from rational-instrumental evaluations of consequences, and may include both positive and negative emotional responses of varying strengths. Affect has a more or less unconscious input to decision-making, and is governed by instinctive behavioural responses to particular situations.

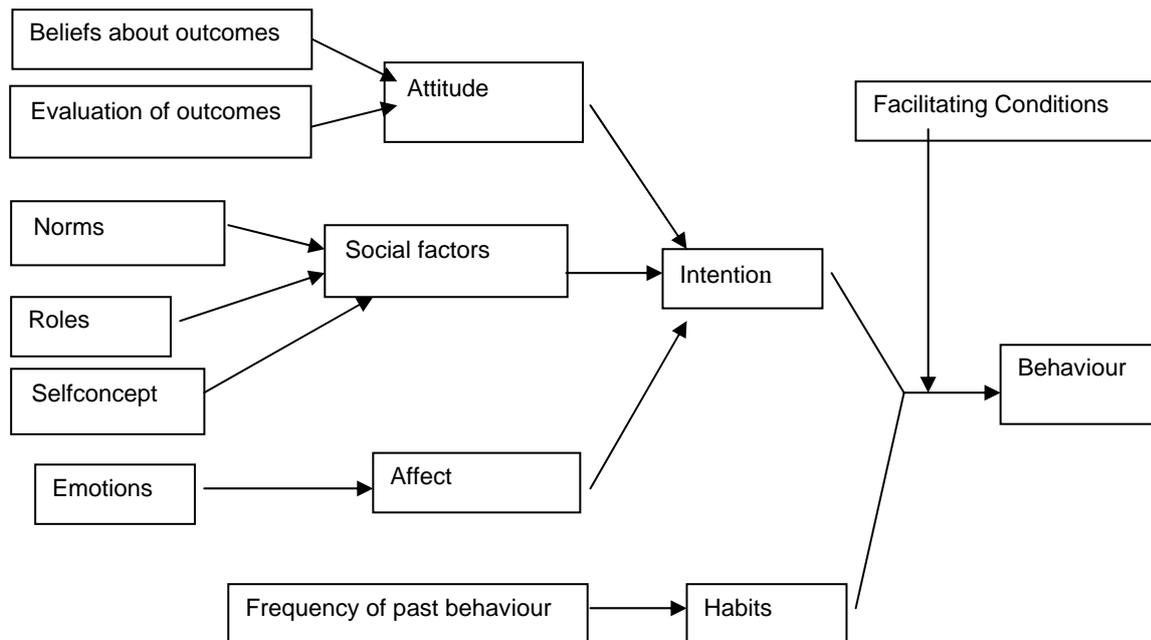


Figure 3 Triandis' Theory of Interpersonal Behaviour

Triandis offers an explicit role for affective factors on behavioural intentions. In more recent writings, the attempt to incorporate emotional antecedents into a model of action has received a lot of support (Bagozzi *et al.*, 2002, Steg *et al.*, 2001). Triandis theory of interpersonal behaviour captures many of the criticisms levelled at rational choice theory in a way that is not done by some of the other models. It also can be, and has been, used as a framework for empirical analysis of the strengths and weaknesses of the component factors in different kinds of situations. It also can be, and has been, used as the framework for empirical analysis of the strengths and weaknesses of the component factors in different kinds of situations. Far less use has been made of Triandis work than was made of the Ajzen- Fishbein work. However, where it has been used, it appears to have additional explanatory value over Ajzen's model, in particular, by including role beliefs and habits.

6.3 The Motivation-Opportunity-Abilities model

Another well-known attempt to construct an integrative model for consumer action is the Motivation-Opportunity-Abilities (MOA) model proposed by Ölander and Thøgersen (1995). They pointed to the improvements in predictive power achievable by incorporating an 'ability' concept and a concept of facilitating conditions or 'opportunity' to perform the behaviour into the model (Figure 5). The Motivation component of the MOA model is recognisable in Figure 4 as a simplified version of the Theory of Planned Behaviour (Section 3). However, Ölander and Thøgersen (1995) also suggest several other possibilities here, including the use of the motivational part of Triandis' model.

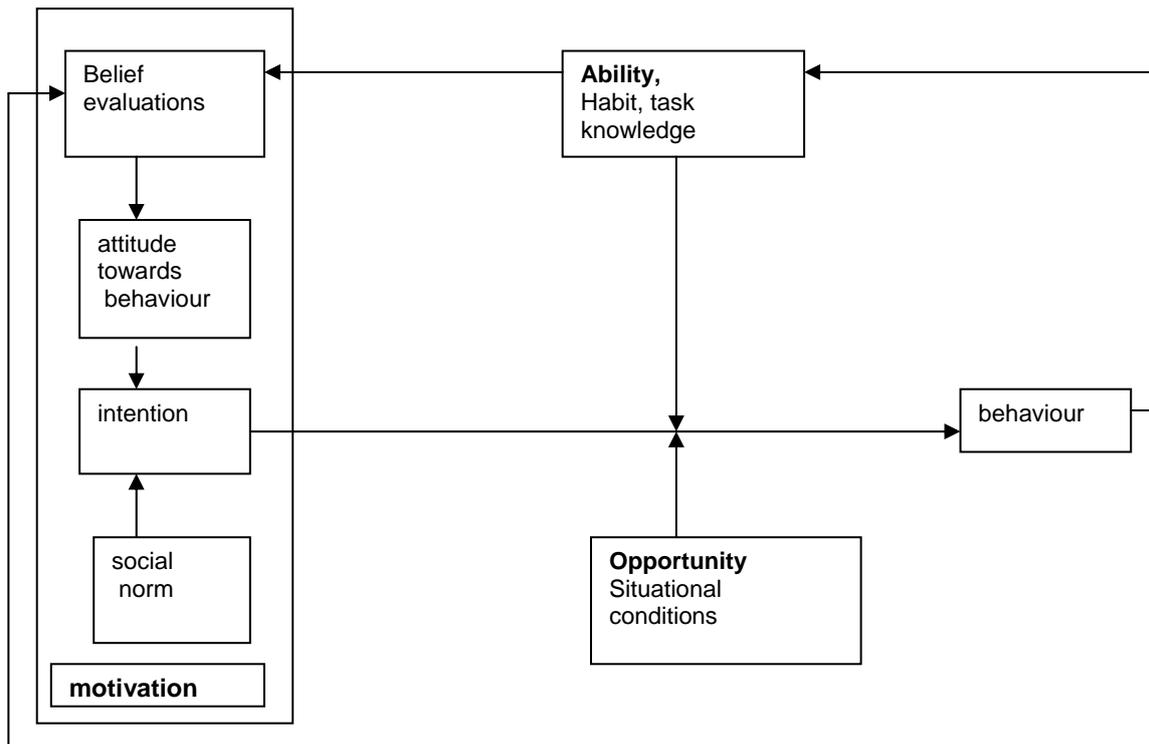


Figure 5: The Motivation-Opportunity-Ability Model

The ‘ability’ concept is supposed to incorporate both a habit and a task knowledge element. Its inclusion in the model draws support from a variety of places, including previous research on waste separation and recycling behaviours (Kok and Siero 1985, Pieters 1989, 1991, Thøgersen 1994a). Habit is both an independent determinant of behaviour and a moderator of intention. The influence of situational factors on consumer behaviours has been raised a number of times in this review. The opportunity component of the MOA model is clearly related to Triandis’ concept of facilitating conditions and Stern’s notion of external conditions. Though Ölander and Thøgersen prefer to see opportunity as ‘objective preconditions for behaviour’, this aspect of the model also has some similarities with Ajzen’s concept of perceived behaviour control – at least in so far as the latter concept is regarded as being a proxy for actual behaviour control. Evidence for the importance of situational factors as a precondition for pro-environmental behaviour is plentiful (Johansson, 1993; Thøgersen 1990; Guagnano *et al.*, 1995).

The important structural feature of the MOA model is its attempt to integrate motivation, habitual and contextual factors into a single model of pro-environmental behaviour. This is even more important as energy behaviour is mainly habitual behaviour, rather than based on conscious decisions.

7. Conclusions on theories

Behaviour is a complex phenomenon and consists of many different factors, both internal to the individual as well as external. The widely used rational choice models do not take this into account sufficiently, and therefore, we have explored a few integrative theories on human behaviour. From this exploration, we conclude that an integrated approach is the most complete approach to study behaviour. In recent literature, however, while adopting both

approaches, does not do this in a structured way. In particular, this literature often does not explore the relationships *between* internal factors and external constraints in any depth. If an integral model is chosen, the relationships between internal and external factors should be studied.

Furthermore, we conclude that the theory of Planned Behaviour is in, one way or another, part of all integrated models. The theory of Planned Behaviour is not sufficient, but can be used as a starting point to make an analysis of internal\motivation factors (see the MOA-model). Some models take habitual behaviour into account. We also think it is necessary to give habitual behaviour special attention, because most energy behaviour is habitual behaviour. The interventions to influence this type of behaviour are, however, completely different from Planned Behaviour.

All models have a common starting point: determinants or factors that influence the behaviour must be established because they explain the behaviour. Therefore, we conclude that that each time we want to influence behaviour, the internal and external determinants of the specific behaviour must be analyzed. Of course, determining the moral, habitual and social motivations and situational conditions that affect specific behaviour is no easy task, and can only be done if they are studied for the specific behaviour in the given situation..

Nonetheless, the broad understanding that consumer behaviour is motivated by these different components, when combined with detailed empirical studies of the strengths of specific relationships, can provide useful lessons for policy-makers seeking to encourage pro-environmental behaviour. Pre-requisites for successful behaviour change initiatives include overcoming problems of consumer lock-in, unfreezing old habits and forming new ones, understanding the complexity of the social logic in which Individual behaviour is embedded.

Policy interventions to influence behaviour so far have mainly taken two directions:

1. Intensive spreading of information, assuming that information will change attitudes, and this, in turn, will lead to a change of behaviour in the desired way;
2. Influencing economic costs and benefits, assuming that this is the main barrier for consumers.

These approaches both stem from the rational choice models that assume people take conscious and rational decisions. This is not always the case, explaining, to a large extent, why these interventions have often not been successful. Therefore, a different approach is needed.

From the variety of factors we found in the models, we conclude that a model of consumer behaviour must have a multiplicity of different points of intervention, for example, through influencing the social and institutional conditions that affect moral choice and social identity, and through addressing the situational conditions associated with specific actions. Furthermore, attention needs to be paid to the cognitive processes of behavioural change. Of course, the complexities of such interventions also pose considerable problems and make considerable demands on policy-makers.

This complexity, however, can be tackled by cutting the big problem into smaller pieces. The planning model described in the next section meets this challenge, and when properly used, can lead to a more effective approach to influence behaviour.

8. A tool for planning successful interventions

To meet the challenge, we recommend the PRECEDE-PROCEED planning model (Green and Kreuter, 1999) for developing policy interventions. For this paper, we confine ourselves to an overview. This planning model meets the most of the demands derived from our conclusions. First, the big problem is cut into smaller pieces. Second, both internal and external factors can be taken into account. And third, behaviour is considered a complex of factors that need unravelling and need to be influenced by a combination of interventions.

Egmond (2005) describes a 3-phase adaptation of the model to energy behaviour. In phase 1, a behavioural and contextual analysis is made: the role of habitual and reasoned behaviour in phase is assessed and the relevant contextual factors are assessed. In phase 2, the determinants of behaviour are analyzed. And in phase 3, instruments are chosen that match the determinants of behaviour. Green and Kreuter summarize their planning model with the slogan: “beginning at the end”, in other words, start with defining the desired goals and work backwards. See Figure 5 for an overview of the planning model.

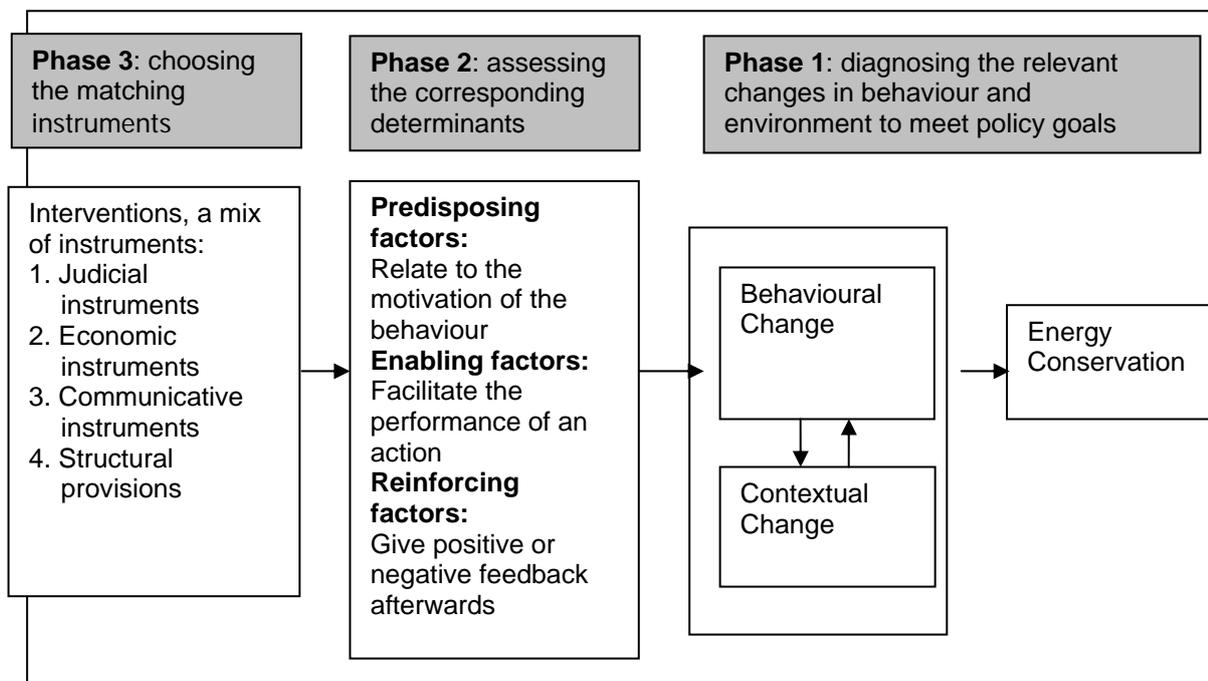


Figure 5 PRECEDE - PROCEED (Modified from Green and Kreuter, 1999)

Phase 1. Diagnosing

This phase consists of two steps:

Step 1 defines the policy goals and the relevant behavioural and contextual change is established, related to a specific goal, e.g. the reduction of CO₂ by 20 % .

Step 2 establishes the most important behavioural and contextual change. Here, the behaviour of the target group is assessed, for example, if it is habitual behaviour or reasoned behaviour. Also, the changeability of the behaviour is established. Always start with the behaviour which has the greatest impact and is most easy to change.

Phase 2. Assessment of the determinants

In this phase, the determinants influencing the target group behaviour are determined. Green and Kreuter (1999) describe three general categories determinants that affect behaviour and environment. Each has a different influence on behaviour.

1. Predisposing factors motivate the behaviour
2. Enabling factors facilitate the behaviour
3. Reinforcing factors provide positive or negative feedback, and contribute to its persistence or repetition.

Behaviour can be explained as a function of the collective influence of these determinants.

1. Predisposing factors are especially internal antecedents to behaviour belonging to the organization; they motivate the behaviour. The factors within this category that can be influenced include the cognitive and affective dimensions of knowing, feeling, believing, valuing, and having self-confidence or a sense of efficacy. Examples are awareness, knowledge, social norm, attitude self-efficacy and intention. Some predisposing factors cannot be easily influenced by policy instruments, for example socio-demographic variables such as income. These factors can, however, be used to segment the target group for marketing purposes.

2. Enabling factors are the external antecedents to behaviour belonging to the situation: they are conditions of the context and facilitate the performance or action of organizations; they allow new behaviour to be realized, Two aspects of enabling factors must be taken into consideration: their availability and their accessibility.

Enabling factors relate to resources and new skills. Resources include external financial, technical and organizational resources. Examples are subsidies, engineering advice, specific advisors. New skills may have to be made available to realize the desired behaviour. For example, a person or an organization may have to learn how to translate its environmental policy into a specific plan of action.

3. Reinforcing factors are those consequences of an action which provide positive or negative feedback, or support. Reinforcing factors include feedback of peers, advice and feedback by powerful and significant others (e.g. authorities offering stimulating subsidies and enforcing obligations). The feedback can be given in several ways: through social benefits, recognition, status, comparison with peer organizations, financial rewards and reactions of customers.

This model gives a robust method to determine both internal and external factors (including feedback) that play a role in behavioural change. If the factors are established by surveying the target group, the 'explaining power' of the specific determinants can be statistically established. This clarifies their relative importance of both internal and external factors.

Phase 3 choosing the appropriate instruments

In this phase, we choose instruments that match the determinants of behaviour—those that effectively alter the determinants. In Figure 6 the effect of policy instrument on the determinants is shown, the so-called 'active ingredients' (Egmond et al.2005).

Judicial instrument have their effect mainly on the organizational norm, and attitude. Furthermore, judicial instruments affect the factor 'feedback of the authorities'. Covenants and agreements have a broader impact, and affect awareness, subjective norm and feedback of

peer organizations. Economic instruments have little effect on awareness, but mainly affect the enabling factor ‘financial resources’. They also affect attitude, because economic instruments positively influence decisions about investments. Communicative instruments have the broadest impact; they have effect on awareness, knowledge, attitude and self-efficacy, but not a big effect on organizational norm and subjective norm. Furthermore, the communicative instruments have effect on a number of enabling factors: technical and organizational resources, and new skills. Benchmark and demonstration have clearly a reinforcing effect. In the instrument table (Figure 6), the active ingredients are reported in detail.

Figure 6: Instrument table, match of instruments and determinants: the active ingredients of instruments

	factors of the model													
	Predisposing factors					Enabling factors				Reinforcing factors				
policy instruments:	Awareness	Knowledge	Organizational norms	Subjective norm	Attitude	Self-efficacy	External financial resources	External technical resources	External organizational resources	New skills	Feedback of peer organizations	Feedback of experts	Feedback of authorities	Feedback of customers
1.1 General Laws and Rules			2		1									1
1.2 Specific permits			2		1									1
1.3 Enforcement	1		2	1	2		1	1						2
1.b Covenants and Agreements	1		1	1	2						2			1
2.1 Subsidy	1				1		2							1
2.2 Levy	1				1		2							1
2.3 Tax differentiation					1		1							1
2.4 Financial Constructions					1		2		1	1				1
3.1 Information and promotion	2	1	1	1	2	1		1	1	2	1	1	1	1
3.2 Training		2				1		1	2	2			1	
3.3 Personal advice		2			1	2		1	2	1			1	
3.4 Demonstration	1	1			1	2		1		1	2	1		
3.5 Benchmarks	1			1							2	1		2
4.1 Infrastructural Provisions	1				1	1		2	1					
4.2 Technical behavioural steering	1				1	1		2	1					

Grey cells indicate that there is an effect on a determinant.
A number in a cell means: 2 is a primary effect; 1 is a secondary effect.

This plan allows us to formulate the intervention strategy. In most cases, determinants are influenced by more than one instrument, and therefore, we should choose ‘an instrument mix’; an effective intervention strategy is made up of various instruments. In the implementation phase, the model can be read from left to right: instruments will affect the determinants of behaviour; this, in turn, leads to a change in behaviour and, thereby, to achieving the goal.

Further reading

The scope of this paper does not allow describing the process of instrument development. Therefore, we recommend the book

Planning health promotion programs, L. Kay Bartholomew, Guy S. Parcel, Gerjo Kok and Nell Gottlieb, .2006, Jossey Bass , San Fransisco.

Although the scope of the book is health related, the approach is in essence the same.

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A multitude of theories, models and frameworks relating to implementing evidence-based practice in health care exist, which can be overwhelming for clinicians and clinical researchers new to the field of implementation science. Clinicians often bear responsibility for implementation, but may be unfamiliar with theoretical approaches designed to inform or understand implementation. A model is a simplified representation of a system or concept with specified assumptions. An example of a model is the Knowledge to Action (KTA) cycle [11]. A theory may be explanatory or predictive, and underpins hypotheses and assumptions about how implementation activities should occur. An example of a theory is the Normalization Process Theory (NPT) [12]. A practical study is presented by Boudreau et al. on a faculty development workshop on narrative-based reflective writing. The authors may be commended on. It includes a table of core concepts from narrative theory, a set of probing questions useful in a basic technical analysis of texts and a list of initiating prompts for exercises in reflective writing. A workshop organized and deployed using this template is deliverable over a half-day. The model has proven to be feasible and highly valued by participants. Lewin's (1945) statement that "nothing is so practical as a good theory" captures a theme that is as important today as it was in Lewin's time. Good theory is practical precisely because it advances knowledge in a scientific discipline, guides research toward crucial questions, and enlightens the profession of management. This special forum focuses on criteria and methods for building good theory. 2. How might one build a good theory? Few answers to this question have been offered that extend beyond those provided in standard methodology textbooks (e.g., Dubin, 1969; Kaplan, 1964; Kerlinger, 1973; Stinchcombe, 1968). While space systems and space system development have many good theories, we think there could be more. This paper is a step towards providing pointers to opportunities for new theories and new applications of existing theories to improve the practical development of space systems. Our intent is a reach back from application difficulties to possibly applicable theories, and a description of what those theories can imply for us. The application difficulties occur throughout the development lifecycle, in acquisition preparation, requirement...