

Normative, Gain and Hedonic Goal Frames Guiding Environmental Behavior

Siegwart Lindenberg* and Linda Steg

University of Groningen

This article discusses new developments about goal-dependent framing and multiple goal frames (sometimes also called “multiple motives”), which are highly relevant for understanding environmental behavior. We introduce goal-framing theory, which postulates that goals “frame” the way people process information and act upon it. Three goal frames are distinguished: a hedonic, gain, and normative goal frame. In general, multiple goals are active at any given time, which may (or may not) be compatible; that is, the strength of the focal goal may be influenced by other goals that are in the background. Based on an extensive review of studies in environmental psychology, we suggest those conditions under which each goal frame may be dominant in influencing environmental behavior. In the environmental context, normative goal frames imply acting pro-environmentally, while gain and hedonic goal frames often result in not acting in an environmentally sound manner. Next, we argue that pro-environmental behavior may be promoted by strengthening normative goals or by making gain and hedonic goals less incompatible with normative goals. Finally, based on goal-framing theory, we suggest questions to be addressed in future research.

Goal Frames Guiding Environmental Behavior

Imagine that you are moving house and all your belongings have already been packed up when you find a bottle of a highly volatile liquid (such as ethyl ether or white spirit) close to the door as you leave the empty house. What would you do? Leave it there? Throw it in the trash container in front of the house? Take it along in the car to your new home? What would your decision depend on? It has long been assumed in psychology and sociology that each person has different

*Correspondence concerning this article should be addressed to Siegwart Lindenberg, Department of Sociology, University of Groningen, Grote Rozenstraat 31, 9712 TG Groningen, The Netherlands [e-mail: s.m.lindenberg@rug.nl].

ways of looking at any given situation, and that these ways are important for determining how a person will behave in that situation. Thus, the decision about what to do with the dangerous bottle is likely to depend, among other things, on “the definition of the situation.” More recently, this insight has gained in sharpness and precision because of the fact that goals were identified as main determinants of how a person looks at a given situation (see Gollwitzer & Bargh, 1996). A goal “frame” is, as it were, the way in which people process information and act upon it. When people change their goals, they will also perceive the situation differently. When it is activated or “focal”, a goal is a combination of a motive and an activated knowledge structure (especially causal knowledge related to means–end relationships concerning the goal; see Gollwitzer & Bargh, 1996). A “goal frame” is a focal goal together with its framing effects (i.e., its effects on cognitive processes, such as selective attention). It does not happen very often that there is only one goal active at any given time. Behavior mostly results from multiple goals that may (or may not) be compatible (see Frederick, Loewenstein, & O’Donoghue, 2002). However, it is very likely that one goal will dominate the framing process.

When constraints are so severe that goals make little difference in the outcome, it is not important to study those motivations (see, e.g., Guagnano, Stern, & Dietz, 1995; Lüdemann, 1998). However, often, choice is possible and motivations and knowledge structures matter. In the present literature on environmental behavior,¹ most approaches focus on one kind of motivation only. For example, Thøgersen (1996) argued that pro-environmental behaviors are typically classified within the domain of morality in people’s mind. According to this view, normative concerns play a key role in pro-environmental behavior, that is, behavioral choices are based on evaluations about what is right or wrong, and environmental concerns play a key role in environmental behavior. However, Stern (2000) argued that environmental intent is only one of the factors affecting behavior, and in many cases not even the most important one. Environmental behavior may follow from various nonenvironmental concerns, such as a desire to save money, or a desire for comfort, freedom, or arousal. Although some scholars explicitly acknowledge that behavior may result from multiple motives (e.g., Stern, 2000), and a few studies examined the role of multiple motives (e.g., Bamberg & Schmidt, 2003; Harland, Staats, & Wilke, 1999), little is known about the way in which motives interact and how they influence the orientation for the individual toward environmental behavior. In short, for the explanation of environmental behavior, the new developments about goal-dependent framing and multiple goals (i.e., motives with knowledge structures) seem highly relevant.

¹ Following Stern (2000), we define environmental behavior as all types of behavior that changes the availability of materials or energy from the environment or alters the structure and dynamics of ecosystems or the biosphere, regardless of whether people are aware of, or consider environmental impacts of specific behavior when making decisions.

In the remainder of this article we first introduce goal-framing theory. Second, we link goal-framing theory to theories and research on environmental behavior. We argue that different theories of environmental behavior tend to focus on different motives or goals, and we explain how goal-framing theory may help to better understand environmental behavior. Next, we elaborate on possible ways to promote pro-environmental behavior based on goal-framing theory. Finally, we put forward several research questions based on goal-framing theory.

Goal-Framing Theory

A theory based on new insights from motivational and cognitive social psychology seems very promising for environmental psychology (Lindenberg, 2001a, 2001b, 2006). Goal-framing theory has emerged from different sources, but it is most strongly influenced by research in cognitive social psychology about influences of goals on cognitive processes. The central idea is that goals govern or “frame” what people attend to, what knowledge and attitudes become cognitively most accessible, how people evaluate various aspects of the situation, and what alternatives are being considered. For example, an advertisement “Keep the Netherlands clean!” may activate the goal to do just that, in which case knowledge and attitudes about cleanliness may be activated. The strength of the goal may be influenced by the amount of trash on the street (an indicator of how other people have behaved), the presence of other people (as possible sources of approval or disapproval) may be especially noticed, the search for possibilities to throw one’s trash into a bin may be activated, etc.

Three Goal Frames

Certain goals are so inclusive that they govern whole areas of subgoals, knowledge, and attitudes. There are three such goals that have been identified and described in some detail (Lindenberg, 2001a) and that seem highly relevant for environmental behavior. They are the *hedonic* goal “to feel better right now,” the *gain* goal “to guard and improve one’s resources,” and the *normative* goal “to act appropriately.” When such a goal is activated (i.e., when it is the “focal” goal, or, as it is called here, a “goal frame”), it will influence what persons think of at the moment, what information they are sensitive to, what action alternatives they perceive, and how they will act.

A *hedonic goal frame* activates one or more subgoals that promise to improve the way one feels in a particular situation (such as avoiding effort, avoiding negative thoughts and events, avoiding direct uncertainty, seeking direct pleasure, seeking direct improvement in self-esteem, seeking excitement etc.). Its time horizon is very short and the criterion for goal realization is an improvement in the way one feels. People in a hedonic frame are especially sensitive to what increases and

what decreases their pleasure and affects their mood. For example, the sight of an empty paint can on one's kitchen counter may create a feeling of uncleanness one would like to get rid of. However, to dispose of a can of paint properly costs effort and the very thought of having to exert this effort may dampen the way one feels. Throwing the can into the trash bin takes almost no trouble and thus, by comparison, makes one doubly feel better. The can is gone and one did not have to exert effort to achieve this.

A *gain goal frame* will make people very sensitive to changes in their personal resources. Its time horizon is middle or long term and the criterion for goal realization is an improvement of (or prevention of decrease in) one's resources or efficiency of resources. For example, if a particular spray that is environmentally harmful is cheaper than the environmentally sound spray, a person in a gain goal frame will choose the former simply because it is cheaper. Subgoals having to do with resources (such as saving money, increasing one's income, dealing with threats to one's financial security), will be easily activated, but subgoals having to do with the way one feels and with normative behavior (see below), are pushed into the cognitive background. Note that norms can play an important role in a gain goal frame to the degree that the individual is focused on positive or negative sanctions. However, in a normative goal frame, to be discussed in the next paragraph, norms affect behavior in quite a different way.

A *normative goal frame* activates all sorts of subgoals associated with appropriateness (such as behaving the right way, contributing to a clean environment, showing exemplary behavior). It will make people especially sensitive to what they think one ought to do. Thus, the important aspects of a situation are normative, both in the sense that one is sensitive to "oughts" according to self or others and sensitive to what one observes other people doing (corresponding to the distinction made by Cialdini, Reno, & Kallgren, 1990, on personal, injunctive, and descriptive norms). For example, a person in a normative goal frame takes the trouble to turn down the central heating when opening the window even if (s)he does not have to pay for the heating bill, simply because this is the "appropriate" thing to do. When people are in a normative goal frame, then subgoals having to do with the way one feels and with personal resources are pushed into the cognitive background.

Smart norms. There is an interesting difference of goal-framing theory with the usual assumption in sociology of internalized norms. Goal-framing theory maintains that the main goal in a normative goal frame is "to act appropriately" and that in a second step the individual would search memory or the environment for cues to answer the question: what behavior would be appropriate in this situation? The more abstract the norms are, the more difficult it is to know what behaviors would be or would not be appropriate. Abstract norms have been called "smart norms" because people need intelligent effort in order to translate the abstract norm to a concrete decision of what is or is not appropriate in a given situation (see

Lindenberg, 2005). In order to deal with smart norms, individuals need information, for example, on what is environmentally harmful, rather than moral training for internalization. This is likely to have changed the relation of scientific knowledge to normative behavior from what it was in traditional societies where these two were quite separate. When people want to act appropriately but do not know how, it is likely that either the gain goal or the hedonic goal displaces the normative goal frame. They give up and go with the more selfish motives.

Goal Frames and Background Goals

We know from experimental evidence and daily experience that motivations rarely are totally homogeneous. More often than not, they are mixed. A dominant normative goal frame does not mean that considerations about gains are completely gone. For example, Oesch and Murnighan (2003) found experimentally that, as the amount of the money to be divided increased, the division deviated more from equality in favor of the divider, even with a friend. Similar findings also apply to other goal frames. For example, experimental evidence shows that people rarely act completely egoistically even if their main goal is gain. Rather, even then they seem to be somewhat restrained by normative concerns (see Camerer, 2003). In short, at any time, one goal is focal and influences the cognitive process the most (i.e., it is a goal frame), while other goals are in the background and increase or decrease the strength of the focal goal.

Often the goal frame and background goals will be in conflict. For example, the environmentally most appropriate outdoor paint may also be the most expensive one, which renders the goal frame and background motives incompatible. In that case the background motive will not affect the *orientation* (i.e., the ordering of alternatives is still in terms of appropriateness, not in terms of price) but may lead to the choice of a less appropriate (but cheaper) alternative. In this case, price will affect the choice less than appropriateness. If goal frame and background were reversed in this example, environmental appropriateness would affect the choice less than price.

The background goals do not necessarily weaken the workings of the goal frame. When they are compatible with the goal frame, they strengthen it. A good example for this is intrinsic motivation, either enjoyment-based (in a hedonic goal frame) or obligation-based (in a normative goal frame; see Lindenberg, 2001b). Research shows that money often crowds out intrinsic motivation (in either frame; see Frey, 1997). However, as one would expect from a goal-framing approach, it is not money *per se* that triggers a particular goal frame, but what it signifies. For example, Ryan and Deci (2000) show that when performance-contingent rewards are administered in a way that does not convey control (i.e., it is “autonomy-supportive”), they will enhance rather than lower intrinsic motivation (see also Srivastava, Locke, & Bartol, 2001).

A priori Strength of Goal Frames

A priori, the three goal frames are not likely to be equally strong. The hedonic goal frame, being related to need satisfaction and thus the most basic, is very likely to be *a priori* the strongest of the three goal frames. In other words, it probably needs the least support from the social surroundings of the individual. As Weber (1946) has shown, the gain goal frame needs institutions (such as religion and/or secure property rights) that allow the individual to act on behalf of a reasonably well-established future self. The normative goal frame is even more dependent on external support, be it through institutions, moralization (see Lindenberg, 1983), or explicit disapproval for not following the norm (see Tangney & Dearing, 2002).

Goal Frames and Environmental Behavior

The three overriding goals (or goal frames) distinguished by goal-framing theory remarkably coincide with popular theories and models within environmental psychology, which typically are focused on one kind of motivation only. The norm activation model (Schwartz, 1977; Schwartz & Howard, 1981) focuses on factors that make people act pro-environmentally—comparable to what we called a normative goal frame applied to environmental situations. By contrast, the theory of planned behavior (Ajzen, 1985) assumes that people are motivated by self-interest: they choose alternatives with highest benefits against lowest costs. Even social norms are being followed for reasons of positive and negative sanctions from significant others. Thus, this theory focuses on what we called a gain goal frame. Theories on affect focus on what makes people feel good as a motive for behavior, which is compatible with what we called a hedonic goal frame. Yet, it is not clear under which conditions which theory is the most powerful in explaining different types of environmental behavior. The various motives are typically studied in isolation, and the predictive power of these theories has hardly been compared, with a few exceptions (e.g., Bamberg & Schmidt, 2003). In this section, we review studies that focus on each of the three goal frames, and we discuss to what extent various theories have been successful in explaining environmental behavior. Based on this, we suggest under which conditions each of the three goal frames may be dominant in influencing environmental behavior. Further, we try to link various theories on environmental behavior, so as to be able to trace possible conflicts among various motives in any given situation of environmental behavior.

Hedonic Goal Frames and Environmental Behavior: Theories on Affect

When a hedonic goal-frame is dominant, one aims to improve how one feels. In this goal-frame, people are very sensitive to factors that affect mood, energy

level (tired or energetic), social atmosphere etc. Such factors play a central role in theories on affect. The role of emotions and affect in influencing behavior has been well established, especially in research on consumer behavior and risk perception (e.g., Cohen, 1990; Finucane, Alhakami, Slovic, & Johnson, 2000; Pfister & Böhm, 1992; Rozin, Lowery, Imada, & Haidt, 1999).

Unfortunately, in the environmental context, relationships between affect and environmental behavior have been addressed in a few studies only (see also De Young, 2000). Smith and colleagues found that affect was significantly related to environmental behavior, even when attitudes were controlled for (Smith, Hautgvedt, & Petty, 1994). This appears to be especially true for individuals whose attitudes were low in accessibility and importance. People are more likely to engage in pro-environmental behavior when they derive pleasure and satisfaction from acting pro-environmentally (Pelletier, Tuson, Green-Demers, Noels, & Beaton, 1998) compared to when they act in line with moral or pro-environmental norms, especially when behavior is relatively difficult. These findings provide some support for the fact that hedonic goal-frames are dominant and, *ceteris paribus*, more strongly affect behavior than do normative goal-frames. De Young suggests that people find some environmental behaviors “are worth engaging in because of the personal, internal contentment that engaging in these behaviors provides” (De Young, 2000, p. 515).

Recently, some studies demonstrated that affect plays an important role in car-use. People who are emotionally attached to car-use drive more frequently and evaluate policy measures aimed at reducing car-use as less acceptable compared to those who are less emotionally attached to their car (Nilsson & Küller, 2000). Steg (2005) found that commuter car-use was best predicted by affect, and not by instrumental motives (such as costs). It is surprising that even commuter traffic, which is likely to be highly functional, is most strongly related to affect. Furthermore, frequent car users evaluated the affective value of cars much more favorably than the affective value of public transport, while infrequent car users judged less positively about the car and less negatively about public transport (Steg, 2003). If hedonic goal-frames indeed play a dominant role in car-use (at least for some car users), people will not respond easily to selective financial incentives, as concerns with gain will be hardly considered when hedonic goal-frames are strongest. People are more likely to respond to financial incentives if their focal goal would change to a gain goal-frame. Future studies should reveal to what extent hedonic goal-frames are influential in other domains as well.

Emotional reactions to environmental problems also appear to be related to pro-environmental behavior. For example, Grob (1995) found that the more intense the emotions are with which individuals react to environmental degradation, the more they will engage in pro-environmental behavior (see also Lee & Holden, 1999). Similarly, emotional affinity for nature is positively related to conservation behavior (Kals, Schumacher, & Montada, 1999).

Gain Goal-Frames and Environmental Behavior: Rational Choice Theory

To recapitulate, in a gain goal-frame, the overriding goal is to guard and improve one's personal resources. When this goal-frame is dominant, people are very sensitive to information about incentives (i.e., costs and benefits in terms of scarce resources such as money, time, status). Rational choice models and expectancy-value models such as the theory of planned behavior (TPB; Ajzen, 1985) assume that behavior results from this motive.

Like other rational choice models, the TPB assumes that individuals are typically motivated by self-interests, that is, they weight expected cost and benefits of alternatives (e.g., money, time, social approval). According to the TPB, behavior results from the intention to engage in specific behavior. Intention is dependent on attitudes towards the behavior, social norms, and perceived behavioral control. Attitudes reflect the overall evaluation of engaging in the behavior, and are based on beliefs about the likely costs and benefits of behavior. Ajzen defined social norms as perceived social pressure to engage in the behavior, based on beliefs about the expectations of relevant reference groups concerning the behavior. Thus, norms reflect *social* costs and benefits. Perceived behavioral control refers to the perceived possibility to perform the behavior, which is dependent on beliefs about the presence of factors that may facilitate or hinder behavior.

The TPB proved to be successful in explaining various types of environmental behavior, such as travel mode choice (Bamberg & Schmidt, 2003; Harland et al., 1999; Heath & Gifford, 2002), household recycling, composting (Mannetti, Pierro, & Livi, 2004; Taylor & Todd, 1995), the purchase of energy-saving light bulbs, unbleached paper use, water use, and meat consumption (Harland et al., 1999). In many cases, attitudes contributed most strongly to the explanation of pro-environmental intention or behavior, which suggests that people are more likely to engage in pro-environmental behavior if they think this has positive consequences for themselves. Interestingly, car and bus use appeared to be most strongly related to subjective norms (e.g., Bamberg & Schmidt, 2003), which suggests that social costs and benefits play an important role in travel mode choices.

A study of Bamberg and Schmidt (2003) revealed that the TPB is far more successful in explaining mode choice than is a model that focuses on activation of moral norms (the norm activation model, see next section). In case of high-cost behavior, people seem most likely to engage in pro-environmental behavior when benefits exceed costs associated with the behavior, that is, in high-cost situations the goal-frame is "gain."

Gross, Harper, and Ahlstrom (1975) found that electricity use in master-metered apartments is 10–25% higher than in otherwise comparable individually metered apartments, which suggests that gain goal-frames affect environmental behavior. Various studies examined effects of changing costs of environmental

behavior, such as costs of household energy use. One way of doing this is providing people with feedback about their energy use and the financial costs associated with it. Such feedback appears to be effective in reducing energy use of high-energy users only. Low users appear to increase their energy use after receiving feedback (e.g., Brandon & Lewis, 1999; Van Houwelingen & Van Raaij, 1989), suggesting that highlighting possible gains is not effective or even counter-effective when gains are low. Pitts and Wittenbach (1981) found financial incentives not to be effective. While a tax credit, that is, an investment subsidy by way of a price reduction, was important for respondents, it appeared not to be the deciding factor in purchase decisions about energy-conserving products, probably because relatively few taxpayers could be expected to receive large credits.

Normative Goal-Frames and Environmental Behavior: The Norm Activation Model

In the environmental context, a normative goal-frame generally implies acting pro-environmentally without close attention to cost or hedonic aspects. Thøgersen (1999) found that the propensity to choose environment-friendly packaging is related to normative concerns, while the perceived costs of this behavior played no role. Clayton (2000) found that environmental justice, that is, responsibility to other species and to future generations, and the rights of the environment, is an important principle in resolving environmental conflicts. Similarly, Hendrickx and Nicolaij (2004) found that ethical concerns play a prominent role in the evaluation of environmental risks. Research advancing a social-dilemma perspective also highlights the significance of normative concerns. One of the reasons why people may not act in their own interest when individual and common interests are at odds is that they want to behave “appropriately” (Dawes & Messick, 2000). According to Dawes (1980, p. 170), people must think about and come to understand the nature of a social dilemma, so that moral, normative, and altruistic concerns can influence behavior. This suggests that normative goal-frames are stronger when people are aware of environmental problems, which increases the likelihood of engaging in pro-environmental behavior. Loukopoulos, Jakobsson, Gärling, Schneider, and Fujii (2004) demonstrated that environmental concern affects the behavioral consequences being considered when making choices. People high in environmental concern focused on environmental consequences, whereas those low in environmental concern especially considered personal outcomes. This corroborates goal-framing theory, that is, people are more likely to consider environmental consequences when environmental concern is high and normative goal-frames are strong. Probably because of this, high environmental concern is associated with acting more pro-environmentally.

The norm-activation model (NAM; see Schwartz, 1977; Schwartz & Howard, 1981) focuses on normative concerns.² The NAM was originally developed to explain altruistic behavior, but has been successfully applied in the environmental context (e.g., Hopper & Nielsen, 1991; Gärling, Fujii, Gärling, & Jakobsson, 2003; Schultz & Zelezny, 1998; Thøgersen, 1999; Vining & Ebreo, 1992). According to the NAM, behavior occurs in response to personal norms, that is, feelings of moral obligation. Personal norms are activated when individuals are aware of adverse consequences of behavior to others or the environment (awareness of consequences, AC) and when they think they can avert these consequences (ascription of responsibility, AR). The NAM has later been extended into the value-belief-norm theory of environmentalism (VBN theory; Stern, 2000). VBN theory proposes that AC and AR are dependent on general beliefs about human–environment relations and on relatively stable value orientations.

The NAM and VBN theory appear to be successful in explaining low-cost environmental behavior and “good intentions” (e.g., willingness to change, willingness to sacrifice, policy acceptability; e.g., Nordlund & Garvill, 2003; Steg, Dreijerink, & Abrahamse, 2005; Stern, Dietz, Abel, Guagnano, & Kalof, 1999), but have less explanatory power in behavioral settings characterized by strong constraints on behavior, for instance, when behavior change is rather costly in terms of effort, inconvenience, money, or time (e.g., Bamberg & Schmidt, 2003; Guagnano et al., 1995; Hunecke, Blöbaum, Matthies, & Höger, 2001). Diekmann and Preisendörfer (2003) used a hypothesis by Kirchgässner (1992), which states that concerns with gain will quickly displace concerns with norms when costs increase (the so-called “low-cost hypothesis” of normative behavior). Their empirical study corroborated the hypothesis, although they report rather weak correlations between environmental concerns and low-cost as well as high-cost behavior. This does not imply, however, that normative considerations and environmental concerns are not influential at all in high-cost situations. Rather, they play a less important role than other considerations, such as costs, effort, and convenience. Indeed, normative, and more specifically, environmental concerns may at times be (weakly) associated with high-cost behavior (e.g., Bamberg & Schmidt, 2003; Gatersleben, Steg, & Vlek, 2002; Nilsson & Küller, 2000).

High-cost situations will fail to displace a normative goal-frame if the latter is particularly strengthened against the gain goal-frame. When there is no extra reinforcement of the normative frame, the low-cost findings are in line with goal-framing theory. Normative goals may be pushed into the background when the costs of pro-environmental behavior are (relatively) high (thereby appealing to a gain goal-frame) or when people do not know how to act pro-environmentally.

² A comparable framework for studying pro-social behavior has been proposed by Geller involving the “actively caring hypothesis” (Geller, 1995). Here, we focus on the NAM, because this framework has received much more attention in environmental studies.

Ambiguous information encourages a switch away from a normative goal-frame to a gain or hedonic goal-frame. Self-serving denial can reduce decisional conflict by further weakening the strength of normative goal-frames in various ways (e.g., Lee & Holden, 1999; Opatow & Weiss, 2000; Schwartz & Howard, 1981). First, actors can deny the seriousness of environmental problems by disregarding, distorting, or minimizing problems resulting from relevant environmental practices. As the severity of environmental problems is often debated by scientists, people can selectively use scientific findings (cf. Opatow & Weiss, 2000). Second, actors can reject their liability for these problems, by believing that their own contribution to problems is undetectable, and seeing environmental problems as the result of collective rather than individual decisions and actions. Furthermore, they may identify others such as higher authorities or industry as responsible for environmental problems (e.g., Pieters, Bijmolt, Van Raaij, & De Kruijk, 1998). Third, they may deny their personal ability or competence to perform the necessary actions. Indeed, various studies revealed perceived behavioral control to be strongly related to environmental behavior (e.g., Harland et al., 1999). Fourth, one may conclude that individual pro-environmental actions are not effective in reducing environmental problems. Indeed, when people believe that their contribution makes no difference, they are less likely to engage in pro-environmental behavior (e.g., Lee & Holden, 1999; Lubell, 2002; see also Kaplan, 2000). This defense mechanism may be quite effective, especially in case of large-scale environmental problems where individual contributions to environmental problems seem trivial indeed.

In conclusion, in case of low-gain decisions, normative goal-frames dominate, while gain goal-frames are focal in case of high-gain decisions. In the latter case, people are very creative in providing arguments or excuses to explain why they ignore environmental norms.

Multiple Motives

In the context of environmental behavior, a gain goal-frame and a hedonic goal-frame often imply acting in line with individual interests, which in many (but not all) cases is not environmentally sound, while a normative goal-frame implies acting pro-environmentally. Many pro-environmental behaviors, such as limiting car use, energy conservation, and the purchase of organic food, require individuals to restrain egoistic tendencies in order to benefit the environment (e.g., Dawes, 1980; Samuelson, 1990). From an individual point of view, it is attractive to act in one's own interest, for example, driving a car, or purchasing cheap (nonorganic) food because of the many individual advantages in the short term. However, in the long run society would be better off if everyone would act pro-environmentally. This implies that multiple conflicting motives may especially play a role in environmental behavior (see also De Young, 2000; Kaplan, 2000), and that goal-framing theory is highly relevant in the environmental domain.

Several studies reveal that environmental behavior indeed results from multiple motivations. Brandon and Lewis (1999) found that both environmental concerns and cost reductions are important to promote energy conservation. In a similar vein, Thøgersen (2003) found that both monetary incentives and personal norms affect recycling behavior. Economic incentives enhanced internalized motivation, and the effect of economic incentives on behavior was mediated through personal norms. Heberlein and Warriner (1983) report that although steep price increases of electricity use in peak periods was effective in shifting electricity use to off-peak periods, normative concerns accounted for more variance in behavior than did the strength of the price increase. In a literature review on the effectiveness of incentives, Stern (1999) also concludes that multiple motives affect behavior, and that the stronger the monetary incentives, the more difference nonincentive factors seem to make for program effectiveness. Furthermore, Stern suggests that strong incentives have effect only when they are noticed. But then, what we pay attention to depends on the goal-frame and, to a lesser degree on the background goals. Harland et al. (1999) and Heath and Gifford (2002) found that personal norms explained variance in pro-environmental behavior in addition to factors included in the theory of planned behavior. In a similar vein, Van Vugt (1997) demonstrated that both individual and collective costs affect approval of privatizing public goods (i.e., railway systems). Hunecke et al. (2001) report that both personal norms and external costs affect subway use, which again suggests that normative and gain goals have complementary effects on behavior. Steg (2005) reports that both social norms and affect were related to commuter car-use, while Lee and Holden (1999) found that both affect and concern for others (i.e., empathy) were related to pro-environmental behavior. Costarelli and Colloca (2004) demonstrated that attitudinal ambivalence, that is, the simultaneous existence of positive and negative dispositions towards environmental issues, is a strong predictor of environmentally friendly behavioral intention. These results suggest that, indeed, environmental behavior results from multiple motivations. These motives may interact in influencing behavior, and do not necessarily conflict.

Stimulating the Adoption of Pro-Environmental Behavior

Of the three goal-frames, the normative frame is probably the most important for pro-environmental behavior in the population at large. People in a hedonic frame will make their behavior especially dependent on mood. If they do not feel like it, they will not act in an environmentally friendly way even if they hold environmental norms. Such a basis is too fickle for achieving stable pro-environmental behavior in the population. People in a gain frame are likely to make their pro-environmental behavior dependent on cost minimization, often with perverse effects. For example, if the town government discourages garbage disposal by charging citizens for each garbage bag put in front of their house,

people are tempted to drop their bags elsewhere. By contrast, behavior resulting from a normative goal-frame with smart norms, that is, with abstract norms that people have to apply to the situation at hand using intelligent effort, can flexibly react to changing circumstances and remain reliably pro-environmental if the smart norms are related to the environment.

In order to achieve this prominence of the normative frame and the functioning of smart-norm behavior, two things are necessary. First, highly abstract smart norms (such as “do not harm others”) must be linked to lower-level smart norms about environmental friendly behavior (such as “act pro-environmentally”), which in turn should be linked to specific behavior (i.e., to shower less). This takes much dissemination of information on the possible links between environmentally unfriendly behavior and hurting others (including future generations). In addition to information, environmental smart norms need to be made strong enough to be easily triggered. Second, the hedonic and gain goals in the background must be made compatible with the normative focal goal, or must be weakened, a bit of both for different subgoals. Thus, based on goal-framing theory, two general suggestions may be given on how to promote pro-environmental behavior and we will briefly discuss them in order.

Strengthening Normative Goal-Frames

Because environmental norms are mostly of the smart-norm variety they need strong support to withstand being pushed into the background by gain or hedonic goal-frames, especially when behavioral costs are relatively high. According to goal-framing theory, normative goals will affect behavior mostly when normative goal-frames are dominant, *and* when people know which behavior is appropriate in a given situation.³ The latter implies that smart norms (such as “to act pro-environmentally”) have to be translated to specific situations. Smart norms will not work if people are ignorant, even if they are motivated to behave normatively. Two factors may inhibit people to act in accordance with their smart norms. First, they may not have sufficient knowledge of environmental problems (e.g., Staats, Wit, & Midden, 1996). Relationships between environmental attitudes and behavior are stronger when environmental knowledge is higher (Meinhold & Malkus, 2005), which suggests that environmental knowledge facilitates people to act in line with normative goal-frames. Second, people may not be aware of the environmental impact associated with their behavior, and not be able to figure out what behavior would be the most environmentally friendly. For example, Joireman, Van

³ Of course, people should be able to engage in the behavior as well. As argued in the Introduction section, here, we focus on situations in which motivations matter. Obviously, when environmental behavior is severely restricted or constrained, interventions should first and foremost aim to remove these constraints.

Lange, and Van Vugt (2004) showed that for the use of public transportation in favor of the use of a car, information on the environmental consequences of car-use (especially considering future consequences) makes a crucial difference. Also, people's perception of energy use of household appliances may not be accurate (Baird & Brier, 1981). Increasing knowledge of environmental impacts of behavior may be successful in this respect. Tailored information appears to be more successful in promoting pro-environmental behavior than are nontailored messages and mass media campaigns (see Abrahamse, Steg, Vlek, & Rothengatter, 2005, for a review).

The translation of smart norms into behavior may be facilitated via environmental labeling. People will especially pay attention to labels when they trust the labels, have a pro-environmental attitude, and think they can help to protect the environment (Thøgersen, 2000). Feedback on one's own behavior is another important source of information that strengthens the normative goal-frame applied to the environment. Feedback appeared to be successful in promoting energy savings (Abrahamse et al., 2005) and curbside recycling (Schultz, 1999). Feedback may be given on own or on group performances. Individual feedback allows people to compare their performance with their own standards or goals (i.e., their personal norm), while group feedback triggers comparisons between own performance and the performance of others (social norms).

In order to successfully compete with hedonic, gain and possibly rival normative goals (such as providing your family with all the comfort and vacation fun they deserve), environmental smart norms can be made subject to a process of "moralization" (see Lindenberg, 1983; Rozin et al., 1999) in which they are clearly linked to morally supporting emotions (ranging from "you are a bad person if you act against this norm" all the way to physical disgust as reaction to deviance, say to somebody who pours turpentine down the toilet). Both smart-norm information and moralization are usually the result of social movements and government campaigns. On a local level, commitment, that is, a pledge or promise to act pro-environmentally, may be a way to moralize environment-friendly behavior (Katzev & Johnson, 1983; Pallak & Cummings, 1976). Voluntary commitments activate personal norms to act pro-environmentally. Also, they enhance the chance that the norm will be internalized (Osbaldiston & Sheldon, 2003). In contrast, when people are forced to change their behavior without being provided with a rationale for doing so, behavioral changes may be accompanied by negative affect and not be supported by changes in attitudes and norms. As a consequence, such behaviors will generally be less stable (Geller, 2002).

Making Gain and Hedonic Goals More Compatible with Normative Goals

Pro-environmental behavior is often associated with higher behavioral costs (e.g., money, time, effort, inconvenience) and also no fun (see also McKenzie-Mohr, 2000). For example, organic food is usually more expensive, and driving a

car is often more convenient and pleasurable than taking a bus. In such cases, people would act pro-environmentally only when a normative goal-frame can remain stronger than hedonic or gain goals lurking in the background. Interventions could be aimed at rendering gain and hedonic background goals less incompatible or even compatible with normative goals, that is, making environmentally friendly behavior more attractive or pleasurable via the use of incentives, and/or behavior with negative environmental impact less attractive or pleasurable by the use of disincentives. Alternatively, gain goals may be made more compatible with a normative goal-frame by influencing the range of aspects considered as gain. For example, extending the time period considered (e.g., Gattig & Hendrickx, this issue) or including effects on other people in the evaluation (e.g., effects of car use on nonmotorized road users) may make gain goal-frames more compatible with normative goals.

When hedonic goals are focal, one should look for ways to make people feel good when acting pro-environmentally. This requires knowledge of factors that influence people's mood. But hedonic aspects also play a role (in the background) when people are in a gain goal-frame. In that case, interventions should not only focus on gain aspects ("this is cheaper") but also on increasing the relative attractiveness of pro-environmental alternatives (e.g., making them faster, safer, more comfortable).

Interestingly, little is known about effective ways to promote positive (or reduce negative) feelings associated with pro-environmental behavior. So far, intervention studies have generally focused on a gain goal-frame. In the environmental literature, several strategies for behavior change have been proposed to targeting different incentives (e.g., financial, legal, physical) associated with behavior (e.g., Cook & Berrenberg, 1981; De Young, 1996; Geller, 2002; Steg & Vlek, in press). Pro-environmental behavior may be promoted via financial instruments (e.g., subsidies, taxes; see Gärling & Schuitema, this issue), legal measures (e.g., laws), or changes in the provision and quality of products and services (e.g., improving cycling facilities, provisions for waste recycling), including the introduction of environmentally sound technologies (see Midden, Kaiser, & McCalley, this issue). Obviously, which of these strategies are most effective in promoting pro-environmental behavior depends on which factors make gain and hedonic frames focal. Thus, the selection of strategies to change behavior should be based on analyses of factors inhibiting engagement in pro-environmental behavior. Although these strategies may increase engagement in the particular behavior, chances are that people will revert to their previous behavior as soon as the (dis)incentives cease. Also, financial incentives may give people the impression that they have a right to pollute, since they have paid for it (Kopelman, Weber, & Messick, 2002; see also Fehr & Falk, 2002).

From the point of view of goal-framing theory, measures aimed at influencing incentives should also be linked to normative aspects because it is ultimately the normative frame that needs to be strengthened, be it directly, be it by weakening

competing hedonic and gain goals. What is needed is that both gain and hedonic incentives should be clearly offered as supports for a normative goal-frame. For example, Steglich (2003) showed that sanctions that are seen as supporting a normative frame strengthen that frame, whereas sanctions seen as (dis)incentives strengthen a gain frame. It thus matters how hedonic and financial incentives are publicly handled. This is also known from the literature on intrinsic motivation, which shows that financial incentives can crowd out intrinsic motivation (see Frey, 1997). Even the intrinsic motivation of those not affected by financial incentives may diminish. The kind of intrinsic motivation needed for pro-environmental behavior is more likely to be obligation-based (which is linked to a normative goal-frame), as enjoyment-based intrinsic motivation is linked to a hedonic frame with all the disadvantages of mood dependence (see Lindenberg, 2001b).

In short, public policy would thus have to be aimed at providing much information that helps sustain environmental smart norms, at “moralizing” pro-environmental behavior, that is, at infusing people with fairly strong negative emotions about anti-environmental behavior (see Lindenberg, 1983; Rozin et al., 1999), and also at lowering the competition of incompatible hedonic and gain goals. Part of this effort would consist of identifying the factors that promote and inhibit pro-environmental behavior, of developing interventions aimed at overcoming these barriers and at evaluating the actual effects of such interventions (see Geller, 2002; McKenzie-Mohr, 2000; Steg & Vlek, in press), be they internal to an individual (e.g., lack of knowledge for following smart norms) or outside the individual (e.g., lack of feasible alternatives).

Concluding Remarks

This article is a first attempt to apply goal-framing theory to environmental behavior. This theory adds three important things to the body of literature in environmental psychology. First, the theory defines three general goal-frames (or goals) that steer decision making and behavior. Second, goal-framing theory proposes an integrated theory that explicates how motives may interact in influencing behavior, and which motives are dominant in specific situations. Third, goal-framing theory links behavioral motivations to interventions, that is, it is proposed which interventions may be especially effective in promoting pro-environmental behavior given variations in goal-frame strength.

Environmental behavior is dependent on multiple motivations. The significance of each type of motivation differs across situations and individuals. Consequently, studying factors affecting environmental behavior in general (i.e., by advancing composite measures of environmental behavior) is not very informative for practitioners as well as scientists (see also Siegfried, Tedeschi, & Cann, 1982). Studying correlates of composite environmental behavior measures does not do justice to the varying significance of multiple motivations and barriers across

behaviors, situations, and individuals (see also McKenzie-Mohr, 2000, Stern, 1999). The significance of different motivations may even vary for different indicators of behavior, for instance, frequency of recycling, amount of recyclable materials, and contamination of recyclables by improper material appeared to be differently related to motivational variables (Oskamp, Burkhardt, Schultz, Hurin, & Zelezny, 1998). Interventions may be more effective when situational and individual determinants of behavior as well as focal and background goal-frames are taken into account.

In this light, future research might focus more on measurement instruments that address multiple motivations in the foreground and background (i.e., goal-framing effects), and on studying to what extent various motives affect behavior, what conditions make them prevalent and stable (see also De Young, 2000), and how they interact. Moreover, future studies could examine which types of policy strategies are most effective in promoting pro-environmental behavior under a dominant normative, gain, and hedonic frame, respectively.

References

- Abrahamse, W., Steg, L., Vlek, Ch., & Rothengatter, J. A. (2005). A review of interventions aimed at household energy conservation. *Journal of Environmental Psychology, 25*, 273–291.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action control: From cognition to behavior*. Heidelberg: Springer.
- Baird, J. C., & Brier, J. M. (1981). Perceptual awareness of energy requirements of familiar objects. *Journal of Applied Psychology, 66*, 90–96.
- Bamberg, S., & Schmidt, S. (2003). Incentives, morality or habit? Predicting students' car use for university routes with the models of Ajzen, Schwartz and Triandis. *Environment and Behavior, 35* (2), 264–285.
- Brandon, G., & Lewis, A. (1999). Reducing household energy consumption: A qualitative and quantitative field study. *Journal of Environmental Psychology, 19*, 75–85.
- Camerer, C. F. (2003). *Behavioral game theory*. New York: Russell Sage.
- Cialdini, R. B., Reno, R. R., & Kallgren, C. R. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology, 58*, 1015–1026.
- Clayton, S. (2000). Models of justice in the environmental debate. *Journal of Social Issues, 56* (3), 459–474.
- Cohen, J. (1990). Attitude, affect, and consumer behavior. In B.S. Moore & A.M. Isen (Eds.), *Affect and social behavior* (pp. 152–206). Cambridge, UK: Cambridge University Press.
- Cook, S. W., & Berrenberg, J. L. (1981). Approaches to encouraging conservation behavior: A review and conceptual framework. *Journal of Social Issues, 37*(2), 73–107.
- Costarelli, S., & Colloca, P. (2004). The effects of attitudinal ambivalence on pro-environmental behavioural intentions. *Journal of Environmental Psychology, 24*(3), 279–288.
- Dawes, R. M. (1980). Social dilemmas. *Annual Review of Psychology, 31*, 169–193.
- Dawes, R. M., & Messick, D. M. (2000). Social dilemmas. *International Journal of Psychology, 35*, 111–116.
- De Young, R. (1996). Some psychological aspects of reduced consumption behavior. The role of intrinsic satisfaction and competence motivation. *Environment and Behavior, 28*(3), 358–409.
- De Young, R. (2000). Expanding and evaluating motives for environmentally responsible behavior. *Journal of Social Issues, 56*, 509–526.

- Diekmann, A., & Preisendörfer, P. (2003). Green and greenback. The behavioural effects of environmental attitudes in low-cost and high-cost situations. *Rationality and Society*, 15(4), 441–472.
- Fehr, E., & Falk, A. (2002). Psychological foundations of incentives. *European Economic Review*, 46, 687–724.
- Finucane, M. L., Alhakami, A., Slovic, P., & Johnson, S. M. (2000). The affect heuristic in judgements of risks and benefits. *Journal of Behavioural Decision Making*, 13, 1–17.
- Frederick, S., Loewenstein, G., & O'Donoghue, T. (2002). Time discounting and time preference: A critical review. *Journal of Economic Literature*, 40(2), 351–401.
- Frey, B. S. (1997). *Not just for the money. A theory of personal motivation*. Cheltenham: Edward Elgar.
- Gärling, T., Fujii, S., Gärling, A., & Jakobsson, C. (2003). Moderating effects of social value orientation on determinants of proenvironmental intention. *Journal of Environmental Psychology*, 23(1), 1–9.
- Gärling, T., & Schuitema, G. (this issue). Travel demand management targeting reduced private car use: Effectiveness, public acceptability and political feasibility.
- Gatersleben, B., Steg, L., & Vlek, C. (2002). Measurement and determinants of environmentally significant consumer behavior. *Environment and Behavior*, 34(3), 335–362.
- Gattig, A., & Hendrickx, L. (this issue). Judgmental discounting and environmental risk perception: Dimensional similarities, domain differences and implications for sustainability.
- Geller, E. S. (1995). Integrating behaviorism and humanism for environmental protection. *Journal of Social Issues*, 51(4), 179–195.
- Geller, E. S. (2002). The challenge of increasing proenvironmental behavior. In R. B. Bechtel & A. Churchman (Eds.), *Handbook of environmental psychology* (pp. 541–553). New York: Wiley.
- Gollwitzer, P. M., & Bargh, J. (Eds.) (1996). *The psychology of action. Linking cognition and motivation to behavior*. New York: Guilford Press.
- Grob, A. (1995). A structural model of environmental attitudes and behaviour. *Journal of Environmental Psychology*, 15, 209–220.
- Gross, G. E., Harper, R. D., & Ahlstrom, S. (1975). *Energy conservation implications of master metering (Vol. 1)*. Kansas City, MO: Midwest Research Institute (NTIS No. PB-254 322).
- Guagnano, G. A., Stern, P. C., & Dietz, T. (1995). Influences on attitude-behavior relationships: A natural experiment with curbside recycling. *Environment and Behavior*, 27, 699–718.
- Harland, P., Staats, H., & Wilke, H. A. M. (1999). Explaining proenvironmental behavior by personal norms and the theory of planned behavior. *Journal of Applied Social Psychology*, 29, 2505–2528.
- Heath, Y., & Gifford, R. (2002). Extending the theory of planned behaviour: Predicting the use of public transportation. *Journal of Applied Social Psychology*, 32(10), 2154–2185.
- Heberlein, T. A., & Warriner, G. K. (1983). The influence of price and attitude on shifting residential electricity consumption from on- to off-peak periods. *Journal of Economic Psychology*, 4, 107–130.
- Hendrickx, L., & Nicolaij, S. (2004). Temporal discounting and environmental risks: The role of ethical and loss-related concerns. *Journal of Environmental Psychology*, 24, 409–422.
- Hopper, J. R., & Nielsen, J. M. (1991). Recycling as altruistic behavior. Normative and behavioral strategies to expand participation in a community recycling program. *Environment and Behavior*, 23, 195–220.
- Hunecke, M., Blöbaum, A., Matthies, E., & Höger, R. (2001). Responsibility and environment: Ecological norm orientation and external factors in the domain of travel mode choice behavior. *Environment and Behavior*, 33(6), 830–852.
- Joireman, J., Van Lange, P. A. M., & Van Vugt, M. (2004). Who cares about the environmental impact of cars? Those with an eye toward the future. *Environment and Behavior*, 36, 187–206.
- Kals, E., Schumacher, D., & Montada, L. (1999). Emotional affinity toward nature as a motivational basis to protect nature. *Environment and Behavior*, 31, 178–202.
- Kaplan, S. (2000). Human nature and environmentally responsible behavior. *Journal of Social Issues*, 56, 491–508.
- Katzev, R. D., & Johnson, T. R. (1983). A social psychological analysis of residential electricity consumption: The impact of minimal justification techniques. *Journal of Economic Psychology*, 3, 267–284.

- Kirchgässner, G. (1992). Towards a theory of low-cost decisions. *European Journal of Political Economy*, 8(2), 305–320.
- Kopelman, S., Weber, J. M., & Messick, D. M. (2002). Factors influencing cooperation in commons dilemmas: A review of experimental psychological research. In E. Ostrom, T. Dietz, N. Dolsak, P. C. Stern, S. Stonich, & E. U. Weber (Eds.), *The drama of the commons* (pp. 113–156). Washington, DC: National Academies Press.
- Lee, J. A., & Holden, S. J. S. (1999). Understanding the determinants of environmentally conscious behavior. *Psychology and Marketing*, 16, 373–392.
- Lindenberg, S. (1983). Utility and morality. *Kyklos*, 36(3), 450–468.
- Lindenberg, S. (2001a). Social rationality versus rational egoism. In J. Turner (Ed.), *Handbook of sociological theory* (pp. 635–668). New York: Kluwer Academic/Plenum.
- Lindenberg, S. (2001b). Intrinsic motivation in a new light. *Kyklos*, 54, 317–342.
- Lindenberg, S. (2005). Smart norms: How do they work and does the school have an important function for making them work? In W. Veugelers & M.H. Bosman (Eds.), *De strijd om het curriculum* (pp. 85–107). Leuven-Apeldoorn: Garant.
- Lindenberg, S. (2006). Prosocial behavior, solidarity and goal-framing processes. In D. Fetchenhauer, A. Flache, B. Buunk, & S. Lindenberg (Eds.), *Solidarity and prosocial behavior. An integration of sociological and psychological perspectives*. Amsterdam: Kluwer.
- Loukopoulos, P., Jakobsson, C., Gärling, T., Schneider, C. M., & Fujii, S. (2004). Car-user responses to travel demand management measures: Goal setting and choice of adaptation alternatives. *Transportation Research D*, 9, 263–280.
- Lubell, M. (2002). Environmental activism as collective action. *Environment and Behavior*, 34(4), 431–455.
- Lüdemann, C. (1998). Framing and choice of transportation mode: Testing the discrimination model vs SEU theory. *Rationality and Society*, 10(2), 253–270.
- Mannetti, L., Pierro, A., & Livi, S. (2004). Recycling: Planned and self-expressive behaviour. *Journal of Environmental Psychology*, 24, 227–236.
- McKenzie-Mohr, D. (2000). Promoting sustainable behavior: An introduction to community-based social marketing. *Journal of Social Issues*, 56, 543–554.
- Meinhold, J. L., & Malkus, A. J. (2005). Adolescent environmental behaviors: Can knowledge, attitudes, and self-efficacy make a difference? *Environment and Behavior*, 37, 511–532.
- Midden, C., Kaiser, F., & McCalley, T. (this issue). Technology's four roles in understanding individuals' conservation of natural resources.
- Nilsson, M., & Küller, R. (2000). Travel behaviour and environmental concern. *Transportation Research D*, 5, 211–234.
- Nordlund, A. M., & Garvill, J. (2003). Effects of values, problem awareness, and personal norm on willingness to reduce personal car use. *Journal of Environmental Psychology*, 23, 339–347.
- Oesch, J. M., & Murnighan, J. K. (2003). Egocentric perceptions of relationships, competence, and trustworthiness in salary allocation choices. *Social Justice Research*, 16(1), 53–78.
- Opotow, S., & Weiss, L. (2000). Denial and the process of moral exclusion in environmental conflict. *Journal of Social Issues*, 56, 475–490.
- Osbaldiston, R., & Sheldon, K. M. (2003). Promoting internalized motivation for environmentally responsible behavior: A prospective study of environmental goals. *Journal of Environmental Psychology*, 23, 349–357.
- Oskamp, S., Burkhardt, R. L., Schultz, P. W., Hurin, S., & Zelezny, L. (1998). Predicting three dimensions of residential curbside recycling: An observational study. *Journal of Environmental Education*, 29, 37–42.
- Pallak, M. S., & Cummings, N. (1976). Commitment and voluntary energy conservation. *Personality and Social Psychology Bulletin*, 2(1), 27–31.
- Pelletier, L. C., Tuson, K. M., Green-Demers, I., & Noels, K. (1998). Why are we doing things for the environment? The motivation toward the environment scale (MTES). *Journal of Applied Social Psychology*, 25, 437–468.
- Pieters, R., Bijmolt, T., Van Raaij, F., & De Kruijk, M. (1998). Consumers' attributions of pro-environmental behavior, motivation, and ability to self and others. *Journal of Public Policy & Marketing*, 17, 215–225.

- Pitts, R. E., & Wittenbach, J. L. (1981). Tax credits as a means of influencing consumer behavior. *Journal of Consumer Research*, 8, 335–338.
- Pfister, J.-R., & Böhm, G. (1992). The function of concrete emotions in rational decision making. *Acta Psychologica*, 80, 199–211.
- Rozin, P., Lowery, L., Imada, S., & Haidt, J. (1999). The CAD triad hypothesis: A mapping between three moral emotions (contempt, anger, disgust) and three moral codes (community, autonomy, divinity). *Journal of Personality and Social Psychology*, 76, 574–586.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development and well-being. *American Psychologist*, 55, 68–78.
- Samuelson, C. D. (1990). Energy conservation: A social dilemma approach. *Social Behaviour*, 5, 207–230.
- Schultz, P. W. (1999). Changing behavior with normative feedback interventions: A field experiment on curbside recycling. *Basic and Applied Social Psychology*, 21(1), 25–36.
- Schultz, P. W., & Zelezny, L. C. (1998). Values and proenvironmental behaviour. A five-country study. *Journal of Cross-Cultural Psychology*, 29(4), 540–558.
- Schwartz, S. H. (1977). Normative influences on altruism. In L. Berkowitz (Ed.), *Advances in experimental social psychology*, 10 (pp. 221–279). New York: Academic Press.
- Schwartz, S. H., & Howard, J. A. (1981). A normative decision-making model of altruism. In J. P. Rushton (Ed.), *Altruism and helping behaviour: Social, personality and developmental perspectives* (pp. 189–211). Hillsdale, N.J.: Erlbaum.
- Siegfried, W. D., Tedeschi, R. G., & Cann, A. (1982). The generalizability of attitudinal correlates of proenvironmental behavior. *Journal of Social Psychology*, 118, 287–288.
- Smith, S. M., Houghtvedt, C. P., & Petty, R. E. (1994). Attitudes and recycling: Does the measurement of affect enhance behavioral prediction? *Psychology and Marketing*, 11, 359–374.
- Srivastava, A., Locke, E. A., & Bartol, K. M. (2001). Money and subjective well-being: It's not the money, it's the motive. *Journal of Personality and Social Psychology*, 80, 959–971.
- Staats, H. J., Wit, A. P., & Midden, C. J. H. (1996). Communicating the greenhouse effect to the public: Evaluation of a mass media campaign from a social dilemma perspective. *Journal of Environmental Management*, 45, 189–203.
- Steg, L. (2003). Can public transport compete with the private car? *IATSS Research*, 27(2), 27–35.
- Steg, L. (2005). Car use: Lust and must. Instrumental, symbolic and affective motives for car use. *Transportation Research A*, 39, 147–162.
- Steg, L., Dreijerink, L., & Abrahamse, W. (2005). Factors influencing the acceptability of energy policies: A test of VBN theory. *Journal of Environmental Psychology*, 25, 415–425.
- Steg, L., & Vlek, Ch. (in press). Understanding and managing environmental resource use, a behavioural science perspective. In J.J. Boersema & L. Reijnders (Eds.), *Principles of Environmental Science*. Amsterdam/Boston: Kluwer Academic Publishers.
- Steglich, C. (2003). *The framing of decision situations. Automatic goal selection and rational goal pursuit*. University of Groningen, NL: Department of Behavioral and Social Sciences, ICS Dissertation Series.
- Stern, P. C. (1999). Information, incentives, and proenvironmental consumer behavior. *Journal of Consumer Policy*, 22, 461–478.
- Stern, P. C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56(3), 407–424.
- 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 environmentalism. *Human Ecology Review*, 6, 81–97.
- Tangney, J. P., & Dearing, R. I. (2002). *Shame and guilt*. New York: Guilford Press.
- Taylor, S., & Todd, P. (1995). An integrated model of waste management behavior. A test of household recycling and composting intentions. *Environment and Behavior*, 27, 603–630.
- Thøgersen, J. (1996). Recycling and morality. A critical review of the literature. *Environment and Behavior*, 28(4), 536–558.
- Thøgersen, J. (1999). The ethical consumer. Moral norms and packaging choice. *Journal of Consumer Policy*, 22, 439–460.

- Thøgersen, J. (2000). Psychological determinants of paying attention to eco-labels in purchase decisions: Model development and multinational validation. *Journal of Consumer Policy*, 23, 285–313.
- Thøgersen, J. (2003). Monetary incentives and recycling: Behavioural and psychological reactions to a performance-dependent garbage fee. *Journal of Consumer Policy*, 26, 197–228.
- Van Houwelingen, J. H., & Van Raaij, W. F. (1989). The effect of goal-setting and daily electronic feedback on in-home energy use. *Journal of Consumer Research*, 16, 98–105.
- Van Vugt, M. (1997). Concerns about the privatization of public goods: A social dilemma analysis. *Social Psychology Quarterly*, 60, 355–367.
- Vining, J., & Ebreo, A. (1992). Predicting recycling behavior from global and specific environmental attitudes and changes in recycling opportunities. *Journal of Applied Social Psychology*, 22, 1580–1607.
- Weber, M. (1946). The social psychology of world religions. In H. H. Gerth & C. Wright Mills (Eds.), *From Max Weber* (pp. 267–301). New York: Oxford University Press.

SIEGWART M. LINDENBERG is a professor of theoretical sociology at the University of Groningen, the Netherlands. He is one of the directors of the Interuniversity Center for Social science theory and methodology (ICS) and member of the Royal Netherlands Academy of Arts and Sciences. His main interests lie in the areas of groups, organizations and corporate governance, and microfoundations of theories on cooperation and collective phenomena. He is also coordinator of the *Groningen Project on Assessing Sustainable Corporate Performance*. His list of publications and other research interests can be accessed via his homepage www.ppsw.rug.nl/~lindenberg.

LINDA STEG is a lecturer in environmental psychology at the University of Groningen. In 1996 she received her PhD in environmental psychology at the University of Groningen for research into understanding and changing car use. Her research focuses on measuring, understanding, and changing environmentally significant behavior, like household energy use and car use. She has coordinated various multidisciplinary research projects on environmental sustainability and supervises several PhD projects. Steg is president elect of Division 4 “Environmental Psychology,” and treasurer of Division 13 “Traffic and Transportation Psychology” of the International Association of Applied Psychology (IAAP). Furthermore, she coordinates the sustainability network of the International Association of People-Environment Studies (IAPS).