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Intrinsic Motivation, Norms and Environmental Behaviour: The Dynamics of Overarching Goals

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ABSTRACT

The understanding, prediction, and encouragement of pro-environmental behaviour (i.e., behaviour that impacts the environment as little as possible) depend to a large extent on understanding the motivational dynamics of pro-environmental behaviour. In this review paper, we discuss the state of the art with regard to these dynamics. We explain the importance of three types of goals underlying behaviour: the hedonic goal to feel good, the gain goal to enhance one's resources, and the normative goal to act appropriately. The strength of these goals differs across situation, which affects which aspects in the situation people attend to, how they evaluate these aspects, and which choices they make. We describe factors affecting the strength of goals, and how the normative goal to act appropriately can be strengthened so as to encourage sustained pro-environmental actions. More specifically, we propose that values affect the chronic strength of goals. Besides, various situational factors can affect the strength of goals in a particular situation. These situational factors explain why people do not have stable preferences and why they do not always act upon the values they prioritise. Finally, we discuss strategies that can be employed to encourage pro-environmental actions. These strategies are either aimed at reducing the conflict between

different goals by aligning the hedonic and/or gain goal with the normative goal, or at strengthening the normative goal so that people will act pro-environmentally even though this may reduce the realisation of their hedonic or gain goals.

Keywords: Values, Norms, Intrinsic Motivation, Goal Framing Theory

JEL Codes: Q01, Q20, Q28, Q30, Q38

Environmental degradation has been listed as one of the major societal threats by the United Nations in 2004 (United Nations, 2004). The depletion of resources, the destruction of ecosystems, and the extinction of wildlife threaten the fulfilment of social and ecological objectives and needs. Anthropogenic emissions of greenhouse gases are the highest in history, and recent climate changes have had widespread impacts on human and natural systems on all continents and across the oceans (IPCC, 2014). Many environmental problems, including anthropocentric climate change, are caused by human behaviour and could thus be significantly reduced if people would engage in pro-environmental actions more consistently (Dietz *et al.*, 2009; Pawlik and Steg, 2013; Steg and Vlek, 2009; Vlek and Steg, 2007).

Various scholars have stressed that social scientists can play a key role in managing environmental problems, by increasing our understanding of how to motivate and empower people to act pro-environmentally (Hackmann *et al.*, 2014; ISSC and UNESCO, 2013; Sovacool, 2014; Vlek and Steg, 2007; Weaver *et al.*, 2014). More specifically, social scientists have put forward various behavioural theories that increase our understanding of which factors cause environmental behaviour, and how these factors can be addressed in environmental policy (Lindenberg and Steg, 2007, see also Folmer, 2009; Folmer and Johansson-Stenmann, 2012). Moreover, social scientists can examine which factors underlie the effectiveness and acceptability of environmental policy, and how these factors can be addressed so that policy can realise its goals, thereby securing human quality of life (Dietz *et al.*, 2013; Steg *et al.*, 2015). Given the urgency of some prominent environmental problems, such as anthropogenic climate change, substantial modification of a wide range of actions by many different people is needed. For this reason, it

seems particularly important to examine whether general factors can be identified that can promote wide-scale changes in behaviour.

We propose that the understanding, prediction, and encouragement of pro-environmental behaviour depend to a large extent on understanding the motivational dynamics of environmental behaviour. We review which types of motives, or goals, affect environmental choices, and discuss which factors affect the strength of different types of motivation underlying pro-environmental actions. Next, we discuss policy implications of our reasoning, and consider how to promote durable and wide-scale changes in pro-environmental behaviour.

1 Overarching Goals Underlying Environmental Behaviour

Imagine that you do your grocery shopping, buying dinner for the evening. At the vegetable section, you have the choice between organic tomatoes, and non-organic greenhouse tomatoes. Which tomatoes would you choose? Which aspects would you consider when making your choice? Goal-framing theory proposes that the way people select and process information and act upon it depends on the relevant strength of overarching goals (Lindenberg and Steg, 2007). Three types of such goals are distinguished: the hedonic goal to feel better right now, the gain goal to maintain or improve one's resources (e.g., money, status), and the normative goal to do the appropriate and right thing. We argue that the strength of goals depends on the values people endorse, and on situational factors that make people focus on a particular goal (Steg *et al.*, 2014a); we will elaborate on this in the next section. When a hedonic goal is strongest, people will particularly consider aspects that affect the way they feel in a particular situation, such as the amount of effort involved, or the extent to which options may bring pleasure and excitement. In our example above, people with a strong hedonic goal may particularly consider the tastiness or the shape and look of the tomatoes. A strong gain goal will make people very sensitive to changes in their personal resources, such as their financial resources or status. This implies that people are likely to opt for the cheapest tomatoes when a gain goal is focal. When the normative goal is strongest, people will particularly consider what is the right thing to do, such as contributing to a clean environment. People with a strong normative

goal will be sensitive to what they ought to do according to self and others (Lindenberg and Steg, 2007), and are thus more likely to act upon personal norms (i.e., feelings of moral obligation to do the right thing) and injunctive norms (i.e., perceptions of what most others will approve or disapprove; Cialdini *et al.*, 1990). In our example above, people with a strong normative goal will probably opt for the organic tomatoes because they particularly consider the environmental impact of the tomatoes, while they are less sensitive to the costs or tastiness of the tomatoes.

All three goals are likely to affect the choices people make. However, the goal that is strongest (i.e., the goal frame) in a situation will have the strongest influence on cognitive and motivational processes, making people sensitive to certain kinds of information and consequences related to that goal, and making them focus on certain alternatives, neglecting others. The goal frame also affects how people evaluate various aspects of the choice situation, which may lead to a choice that is rather different from what it would have been in a different goal frame. For example, people will be less likely to do the appropriate thing and to act in line with the normative goal when a conflicting overarching goal is strengthened. Indeed, people were less successful in reaching their goal to reduce fuel consumption when they had to accomplish a conflicting goal, in this case being on time for an appointment (related to a gain goal), at the same time. This suggests that a normative goal can be pushed to the cognitive background when a competing gain goal becomes focal (Dogan *et al.*, 2011; see Darley and Batson, 1973, for a similar example on helping behaviour). Goals in the cognitive background can still exert some influence. When background goals are compatible with the goal frame, they increase the likelihood that people choose options that realise this focal goal. For example, people are more likely to buy organic tomatoes when a hedonic goal in the background supports a normative goal frame (e.g., when the organic tomato is also the most tasty tomato). Yet, goals in the background will decrease the likelihood that people choose options in line with the goal frame when both are incompatible. For example, a gain goal may weaken the strength of the normative goal frame when the organic tomato is more expensive. The weaker the strength of the goal frame, the greater the influence of goals in the background. In short, for behaviour, it is crucial which of the three overarching goals is the goal frame and whether the goals in the background are compatible or incompatible with the goal frame.

In principle, all three types of overarching goals could promote pro-environmental actions. For example, when the hedonic goal is strongest in a situation, people may choose to cycle rather than drive to work because they enjoy the exercise and being outside. Similarly, when a gain goal is strongest, people may be motivated to reduce their home energy use, as this will save them money, or purchase an electric vehicle when they believe that this would enhance their status. When a normative goal is strongest, people may save energy or buy organic products as to reduce their environmental impact. Yet, in many cases acting pro-environmentally is somewhat costly and not that pleasurable, making it less likely that people will engage in such behaviour when hedonic or gain goals are strongest. For example, organic products are typically more expensive, electric vehicles have a limited range, and people may prefer to drive rather than cycle to work when it is raining. This suggests that hedonic or gain goals provide an unstable source for sustained pro-environmental action, as people will only engage in such behaviours when it is pleasurable and not effortful (in case of a strong hedonic goal), or when the behaviour is not too costly (in case of a strong gain goal); in many situations, pro-environmental actions are not the most pleasurable and profitable option. In contrast, when a normative goal is strongest, people are motivated to act appropriately and to do the right thing, even though this may be somewhat more costly (e.g., in terms of time, money) or less pleasurable (e.g., more effortful). Given that people generally care about the environment, this implies that the normative goal is more likely to result in durable pro-environmental actions, in which case they act pro-environmentally time and again, in many different situations (De Groot and Steg, 2009; Steg *et al.*, 2014a).

The importance of the normative goal frame points to a specific kind of intrinsic motivation for pro-environmental behaviour. In the literature, “intrinsic motivation” is often associated with enjoyment (Ryan and Deci, 2000). Yet, pro-environmental actions are more likely to be rooted in a different type of intrinsic motivation. Acting appropriately, and more specifically acting pro-environmentally, can make people feel good about themselves, which may even evoke a literal warm glow, as reflected in a higher temperature perception (Taufik *et al.*, 2015). This is intrinsic motivation first and foremost on the basis of a commitment to principles, values and norms, and the pleasure it gives is derived from doing the right thing and benefiting the environment (De Groot and Steg, 2010; Pelletier *et al.*, 1998; Venhoeven *et al.*, 2013). Hence, enjoyment itself is

mostly not the motivator of pro-environmental actions (which would be the case in a hedonic goal frame; Ryan and Deci, 2000), but rather it is an intrinsic feeling of obligation (Lindenberg, 2001). People will mostly not engage in specific pro-environmental behaviours merely because they find them pleasurable as such, but because they feel morally obliged to follow their principles, norms and values to engage in pro-environmental actions (and thus have a strong personal norm to do so), and doing so elicits pleasant feelings (Van der Werff *et al.*, 2013a). Given the difference between foreground and background goals, one can say that in such cases, enjoyment (i.e., the hedonic goal) contributes most to stable environmental behaviour when it is in the background, strengthening the normative goal frame and thereby the obligation-based intrinsic motivation.

2 Factors Influencing the Strength of Overarching Goals in a Given Situation

An important question is which factors affect the relative strength of different goals, and particularly, which factors increase the likelihood that the normative goal is strongest. As indicated earlier, we propose that the relative strength of hedonic, gain, and normative goals depends on the extent to which people endorse different values, and on the degree to which situational factors strengthen or weaken the three types of goals. The latter implies that, in contrast to what is often assumed in economics (Stigler and Becker, 1977), people do not have stable preferences. Rather, the strength of hedonic, gain, and normative goals will vary across situation, which explains the dynamics for people's goals and behaviour across situations. Below, we first describe which values affect the strength of the different goals. Next, we explain the dynamics of the shifting in goal strength due to situational factors (Lindenberg and Steg, 2007; Steg *et al.*, 2014a).

2.1 Values

Values are conceptions of the desirable, ordered by relative importance, that influence the way people select action and evaluate events (Schwartz and Bilsky, 1987, p. 550). Values are general preferences that transcend

situations and are relatively stable across time (Feather, 1995). This makes values conceptually different from goals: values reflect which general goals people find most important in life in general, whereas goals as defined in goal-framing theory reflect what motivates people in a given situation. Notably, values affect the strength of the three overarching goals. When people strongly endorse a particular type of value, the goals related to this type of value are likely to be stronger, making it more likely that these goals steer decision-making and behaviour in different situations. Because values are fairly stable, they render some goals chronically stronger than others. Yet, the strength of goals not only depends on the extent to which individuals endorse different values, but also on situational factors, as we will explain later.

Pro-environmental beliefs, norms, and actions particularly are related to the extent to which people prioritise self-enhancement values, in which case people mostly consider consequences of behaviour for themselves, versus self-transcendence values, in which case people mostly consider consequences of their behaviour for others and the environment (Dietz, 2015; Dietz *et al.*, 2005; Steg and De Groot, 2012). Two types of self-enhancement values can be distinguished. Hedonic values refer to trans-situational preferences for what makes individuals feel good and what reduces effort. Egoistic (i.e., gain-related) values refer to trans-situational preferences for aspects that may secure or increase one's resources (Steg *et al.*, 2014b). Besides, two types of self-transcendence values are most relevant for understanding pro-environmental beliefs and actions: altruistic values that make individuals focus on consequences for other people, and biospheric values that make individuals focus on the consequences of their choices for nature and the environment (De Groot and Steg, 2007, 2008; Steg and De Groot, 2012). Hence, two different entities that transcend the individual relate to the normative goal: the collective (i.e., altruistic values), and nature and the environment (i.e., biospheric values).

In principle, individuals endorse all four types of values to some extent. However, they prioritise different values differently, which is likely to affect the relative strength of overarching goals in a given situation. In this way, values steer attention and affect which type of consequences people consider when making choices (Steg *et al.*, 2014b). Individuals with strong hedonic values are more likely to have a strong hedonic goal and therefore to consider hedonic consequences of choices alternatives;

those with strong egoistic values are more likely to have a strong gain goal and therefore consider egoistic consequences; strong altruistic values increase the likelihood that people have a strong normative goal and consider the consequences of choices for others and of social collectivities, while strong biospheric values increase the likelihood that a strong normative goal leads to an increased consideration of the consequences for nature and the environment when making choices (De Groot *et al.*, 2013; Perlaviciute and Steg, 2014, 2015; Steg *et al.*, 2014b). In line with this, research has shown that strong altruistic and particularly strong biospheric values are associated with more favourable evaluations of pro-environmental choices and engagement in pro-environmental behaviour, which suggests that both altruistic and biospheric values strengthen the normative goal to act appropriately. In contrast, strong hedonic and egoistic values are associated with less favourable evaluations of and reduced engagement in pro-environmental actions (e.g., Nordlund and Garvill, 2002; Steg and De Groot, 2012; Stern *et al.*, 1998, 1995; Thøgersen and Ölander, 2002, for a review). Biospheric values are most strongly and consistently related to pro-environmental beliefs, norms, and behaviour.

People across the world appear to endorse biospheric values relatively strongly (De Groot and Steg, 2007; Jakovcevic and Steg, 2013; Steg and De Groot, 2012). So why is it that individuals do not consistently engage in pro-environmental behaviour? We propose that strong endorsement of biospheric values does not necessarily imply that the normative goal is strongest in a given situation. Values influence the chronic strength of the three goals. Besides values, situational factors also affect the strength of overarching goals, including the normative goal. This influence may go against the influence of values. For example, for somebody with strong biospheric values, strong situational factors may strengthen the hedonic goal, and may even result in the hedonic goal becoming focal (i.e., the goal frame) in a given situation. In the next section, we describe how situational factors can influence the strength of overarching goals.

2.2 Situational Factors

Situational factors can affect the relative strength of different goals in a situation, which influence our decisions (Dietz and Stern, 1995; Steg *et al.*, 2014a). Situational factors can affect the strength of overarching goals

because of their connotation, thereby making people consider certain alternatives for their action rather than other alternatives. For example, hedonic symbols like models in bikinis or tasty chocolates are likely to strengthen the hedonic goal, while status symbols, signs of competition, or signs of money are likely to strengthen the gain goal. Similarly, normative symbols such as reminders of ethical commands (e.g., bibles, the ten commandments), symbols of legitimate legal commands (e.g., a statues of Lady Justice), emoticons conveying social approval or disapproval, natural scenes, or labels that convey biospheric relevance (such as “organic” or “energy-friendly”) are likely to strengthen the normative goal (Hahnel *et al.*, 2014; Kasser *et al.*, 2007; Lindenberg, 2012; Perlaviciute, 2014; Schultz *et al.*, 2007; Steg, 2012; Verplanken and Holland, 2002). Such symbols are likely to make people focus on normative, and more particularly environmental aspects of behaviour.

Other important situational factors that influence the strength of goals derive from perceptions of the behaviour of others. Perceptions of the behaviour of others not merely communicate to what extent specific behaviour is sensible to do (cf. descriptive norms, Cialdini *et al.*, 1990), but can also convey the level of respect and care for specific injunctive norms, thereby influencing the strength of the normative goal. More specifically, signs of norm violating behaviour of others signalling that others do not act appropriately and do not respect (injunctive) norms may weaken the strength of one’s own normative goal in that situation, thereby increasing the relative strength of hedonic and gain goals, making it more likely that the observer will also violate the same and other norms in that situation (Keizer *et al.*, 2008, 2011). For example, people were more likely to litter in a littered environment (Cialdini *et al.*, 1990; Keizer *et al.*, 2011), when buildings were covered with graffiti, or when they observed that others did not bring their shopping cart from the parking lot back to the shop (Keizer *et al.*, 2008). Similarly, appropriate behaviour such as helping someone in need may become less likely when observing that others acted inappropriately by leaving garbage where this is not allowed (Keizer *et al.*, 2013). On the other hand, situational factors that signal that other people do act appropriately and respect norms can increase the relative strength of the normative goal compared to the hedonic and gain goal, which will make people more likely to follow situationally relevant (injunctive) norms, including pro-environmental choices, even though this is somewhat

effortful. Indeed, people are less likely to litter when they observe that others are voluntarily removing other people's litter (Reno *et al.*, 1993). Similarly, people were more likely to help a person in need when they observe that other people respect norms (Keizer *et al.*, 2013), suggesting that the effort of helping is less salient to them.

Furthermore, strength of the three different goals depends on the costliness of the relevant behaviour. Even for people with strong biospheric values, factors concerning costs can increase the relative strength of the gain goal so much that the normative goal is pushed into the background. Hence, in some cases, acting pro-environmentally would seriously inhibit the fulfilment of hedonic and/or egoistic values and related goals that are also important to people. This explains why people do not always act according to the values they prioritise. For example, research has shown that biospheric values and normative considerations are less strongly related to costly pro-environmental behaviour (Diekmann and Preisendörfer, 2003), including sustainable transport mode choices (Abrahamse and Steg, 2011; Bamberg and Schmidt, 2003). On the other hand, when pro-environmental behaviour is very attractive, even those with weak biospheric values may engage in such actions. These findings suggest that biospheric values will not strongly predict pro-environmental behaviour that is very unattractive or very attractive (Guagnano *et al.*, 1995).

Weakening of the strength of the normative goal can also happen when people are exposed to cognitively demanding situations, with a so-called high cognitive load, where they have to balance multiple goals. This may reduce the chance of pro-environmental behaviour. For example, people hardly considered their fuel consumption in highly demanding traffic situations (Dogan *et al.*, 2011). When having conflicting concrete goals, people need to prioritise these goals and are likely to neglect some important goals in order to perform well on the main task (Ünal *et al.*, 2012). The normative goal may need cognitive resources that are dispersed in such demanding situations (Robinson *et al.*, 2010).

3 Encouraging Pro-environmental Behaviour

Our reasoning above suggests that the strength of the three overarching goals depends on values and situational factors, and that both have to be

considered simultaneously to understand and predict pro-environmental actions. This also helps us to understand how pro-environmental behaviour can be encouraged.

As indicated above, many pro-environmental choices involve a conflict between hedonic and gain goals on the one hand, and on the other hand the normative goal: For many, acting pro-environmentally is the right thing to do, but oftentimes it is more effortful, inconvenient, or expensive. How can we encourage pro-environmental actions, given this goal conflict? A common strategy is to reduce or even remove the conflict between different goals, so that acting pro-environmentally is not only the right thing to do, but also the most pleasurable and/or profitable option. By doing so, people would engage in pro-environmental behaviours even when hedonic or gain goals would be strongest. Yet, a different and less common approach would be to try to strengthen the normative goal, so that this goal is prioritised and people are more strongly motivated to do the right thing, even though it may be somewhat costly or effortful (Steg, 2015; Steg *et al.*, 2014a). Below, we discuss both approaches, and review empirical evidence of the success and possible limitations of both approaches.

3.1 Reducing or Removing the Conflict Between Hedonic, Gain, and Normative Goals

Many approaches to encourage pro-environmental behaviour address individual's hedonic and gain goals, by emphasising or enhancing the personal benefits or reducing the personal costs of targeted behaviour. For example, subsidies are provided to reduce costs of pro-environmental actions, environmental taxes are implemented to increase the costs of environmentally harmful actions, or speeding cameras and speed bumps are installed to make speeding less attractive. Such approaches can promote requisite behaviour, and may even be needed when pro-environmental actions are relatively costly or even not feasible. They may motivate people to try out the targeted behaviour, which in some cases can make them realise that the relevant behaviour has more advantages than anticipated. This can result in more positive attitudes towards the behaviour targeted, making it more likely that people will stick to the new behaviour, even when incentives have been removed (Fujii and Gärling, 2005; Thøgersen, 2009).

Yet, research shows that strategies that mainly target hedonic and gain goals to engage in pro-environmental actions generally provide a fickle basis for sustained pro-environmental actions when employed in isolation. Notably, such strategies make people focus on immediate personal costs and benefits of actions (Steg, 2015; Steg *et al.*, 2014a). As such, incentives can change the decision frame and consequently the relative strength of overarching goals, turning an otherwise moral decision (what is appropriate to do?) into a gain goal-related decision (what is in it for me?; Tenbrunsel and Messick, 1999). As a consequence, people are likely to only engage in pro-environmental behaviour when it is clear that it is profitable or convenient for them to do so (De Groot and Steg, 2009; Heyman and Ariely, 2004). Indeed, effects of financial incentives to promote eco-driving disappeared as soon as the incentives were removed (Bolderdijk *et al.*, 2011). Furthermore, people initially engaged in pro-environmental actions because they considered it the right thing to do may no longer be focused on normative aspects when financial incentives have been introduced (Deci *et al.*, 1999; Frey, 1997), which may inhibit pro-environmental actions. Related to this, financial incentives can shift attention away from possible environmental benefits, even when these are emphasised (Schwartz *et al.*, 2015), and, as a consequence, they can even reduce targeted pro-environmental actions (Handgraaf *et al.*, 2013). Moreover, focusing people on the financial consequences of pro-environmental actions can inhibit other subsequent pro-environmental behaviour: when people received information on the financial rather than environmental benefits of a given behaviour, they were less likely to engage in other pro-environmental actions in a following situation (Evans *et al.*, 2012; Steinhorst *et al.*, 2015). Furthermore, financial incentives can give people the impression that they have the right to pollute because they have paid for it (Kopelman *et al.*, 2002, cf. Fehr and Falk, 2002; Gneezy and Rustichini, 2000a).

Additionally, responses to pricing appear to vary substantially with the specific policy implementation, suggesting that the mere presence of financially attractive behaviour options is not sufficient to induce behaviour change. For example, the effects of pricing appeared to depend on marketing strategies, reliability of and trust in the programme, and the effort needed to realise the proposed changes (Stern, 1986; Stern *et al.*, 1986). Given such favourable conditions, large financial incentives may motivate people to behave pro-environmentally. However, often,

even if the conditions are right, financial incentives are rather small, in which case the gain goal will be strengthened to the detriment of the normative goal, but changes in behaviour are perceived not to be worth the effort (Bolderdijk and Steg, 2015). As Gneezy and Rustichini (2000b) summarized this effect: pay enough or don't pay at all. Indeed, appeals emphasising the modest financial benefits of tire pressure checks were not effective (Bolderdijk *et al.*, 2013; see also Schwartz *et al.*, 2015). Many single pro-environmental actions yield small personal benefits and are perceived as not worth the effort (Dogan *et al.*, 2014). For example, unplugging a single coffee machine or microwave would save less than 6 Euros a year, and turning off the car engine while waiting for a railroad crossing would save 5 Eurocents. Yet, small incentives seem to be effective when they are perceived as supporting the normative goal (Jakovcevic *et al.*, 2014, cf. Burger and Caldwell, 2003).

This implies that exclusively targeting hedonic and gain goals by emphasising or increasing the personal benefits or reducing the personal costs of pro-environmental actions is unlikely to succeed in encouraging durable pro-environmental behaviours. What is important is to make financial and hedonic aspects support the normative goal frame from the cognitive background, without displacing the normative goal itself.

3.2 *Strengthening the Normative Goal*

Besides removing or reducing the conflict between different goals by making pro-environmental behaviour more pleasurable or profitable, attempts could be made to strengthen the normative goal, so that people engage in pro-environmental actions even though this may be somewhat costly, effortful, or inconvenient. Such approaches would not remove the conflict between goals, but rather make this conflict less salient, as people would attach less value to hedonic and gain consequences (Steg, 2015; Steg *et al.*, 2014a).

Our reasoning above suggests that the normative goal can be strengthened by increasing the level of endorsement of biospheric (or altruistic) values. Interestingly, little is known about how values are formed and transformed, and how value strength can be changed. Rather, it is generally believed that values develop early in adulthood and are relatively stable across one's lifetime (Dietz *et al.*, 2005; Feather, 1995; Rokeach, 1973; Stern and Dietz, 1994). Yet, some studies suggest that

the extent to which people endorse different values can change when people's initial values are seriously challenged (Bardi and Goodwin, 2011), or when their way of life is threatened (Lindenberg, 2009). For example, value changes were observed after people encountered significant changes in their life (Brenchin and Kempton, 1994; Hansen *et al.*, 2014; Lönnqvist *et al.*, 2011). Furthermore, biospheric values may be strengthened when scientific evidence shows that environmental problems seriously threaten our way of life, and that engagement in pro-environmental actions is effective to combat such problems. For this to happen, it is important that there are public debates with a strong input from serious scientists (Lindenberg and Steg, 2013b). Future research is needed to systematically test these accounts, and to examine the conditions under which the relative importance of values may change.

Various strategies can be employed to strengthen the normative goal by changing situational factors. Value-related symbols can be introduced or removed in relevant choice situations. As explained above, normative symbols reflecting virtues could be introduced that strengthen normative goals, such as environmental symbols, moral symbols, or religious images, while hedonic or gain symbols, such as business-related or material symbols or symbols reflecting vices that strengthen hedonic and gain goals, respectively, could be removed (Lindenberg, 2012; Steg, 2015). This strategy can potentially be effective to encourage pro-environmental behaviour, because people across the world generally endorse biospheric values rather strongly (Steg and De Groot, 2012), making it likely that people will act upon their biospheric values when situational factors support these values. Future research is needed to test to what extent and under which conditions such situation factors will strengthen the normative goal and promote (biospheric) value-congruent actions.

Reducing the perceived costliness of actions that weaken the normative goal may increase the likelihood that people act according to their biospheric values as well. When acting upon one's biospheric values is very costly, and seriously threatens the fulfilment of other values that are also important to people, changes in the cost and benefits of options are needed to encourage pro-environmental actions. After all, in such cases, even those with strong biospheric values may not choose the pro-environmental option; high behavioural costs are likely to strengthen hedonic or gain goals (Steg *et al.*, 2014a). For example,

few will consider to buy sustainable products when they are three times as expensive as other options, or to travel by public transport when this would imply substantially longer travel times. In such cases, changes in the costs and benefits of behaviour options facilitate value-congruent actions and support the normative goal. Yet, to prevent possible negative side effects of such strategies (as we discussed above), it seems important that such strategies are clearly linked to pro-environmental goals, or more generally, the normative goal (Steg, 2015).

Besides, value-congruent behaviour can be promoted by reducing cognitive demands required to engage in pro-environmental behaviour in a situation. In many situations, people lack the cognitive resources or motivation to process information about ways to reduce their environmental impact. In such cases, ambient persuasive technology can be installed that encourages pro-environmental behaviour even when cognitive resources are limited (Midden and Ham, 2012).

Information provision may be needed when people do not know how to act upon their biospheric values and how to realise their normative goal, or do not know which behaviour would be appropriate in a given situation. In addition, increasingly more norms in our society are what has been called “smart norms” that indicate what is appropriate behaviour in very general terms, making them applicable to various situations, but requiring intelligent effort to follow (Lindenberg and Steg, 2013a). Information on dos and don’ts is important when people are already motivated to act pro-environmentally but have trouble translating the goal to act appropriately into choice of behaviour. For example, one has to know that turpentine is dangerous for the environment when poured into the sink. People often have a poor understanding of the environmental impact of their actions (Attari, 2014; Attari *et al.*, 2010). This leads to the suggestion that education is becoming ever more important to encourage pro-environmental behaviour: individuals need to know the environmental impact of different environmental actions, what specific actions they could take to reduce environmental problems, how to undertake them, and what benefits such actions may have (Frantz and Mayer, 2009; Steg and Vlek, 2009). Hence, information can be provided to increase people’s awareness of the environmental impact of different behaviours, on the various costs and benefits of different options, and on how to undertake specific actions. Yet, in general, information provision by itself is typically not very effective in encouraging pro-environmental

choices (Abrahamse *et al.*, 2005). Yet, information can be effective when it is tailored to the needs, values, and perceived opportunities of the target group (Abrahamse *et al.*, 2007; Bolderdijk *et al.*, 2013; Boomsma *et al.*, 2016; Goodhew *et al.*, 2015; Thøgersen, 2005); innovative communication technologies and new media are promising tools to provide such tailored information (e.g., Pahl *et al.*, 2016).

Furthermore, because the behaviour of others affects the strength of the normative goal, information on pro-environmental actions of others can be provided so that people learn about the extent to which relevant others respect pro-environmental norms. Alternatively, social comparison feedback can be provided so that people can compare their own behaviour and performance with the behaviour and performance of a particular reference group. Both descriptive norm information and social comparison feedback proved to be effective in encouraging pro-environmental actions (Abrahamse and Steg, 2013), although these strategies may be less or even counter effective when people learn that many others do not act pro-environmentally, or when they learn that their environmental performance is much better than the performance of others (Schultz *et al.*, 2007). This may explain why overall effect sizes of these strategies tend to be small (Abrahamse and Steg, 2013).

People are not just influenced by the behaviour of others, but also by their own past behaviour. One's own past behaviour can be a source of information about one's self-identity. Thus, another route to strengthen the normative goal concerns self-identity effects. Being reminded of having acted pro-environmentally in the past may make people realise that they are seemingly a person who cares about the environment (and who has strong biospheric values), which, in turn, will strengthen the normative goal. This will increase the likelihood that people act pro-environmentally in subsequent situations, as people are motivated to act in line with how they see themselves and to be consistent (Van der Werff *et al.*, 2013a, 2014b); doing so makes one feel good. The opposite is likely to happen when people are made aware of the fact they did engage in environmentally harmful behaviour, as this is likely to weaken their environmental self-identity (Van der Werff *et al.*, 2013a, 2014b). This informational effect of one's own past behaviour on one's self-identity will be particularly strong if people can attribute the original behaviours to internal factors and when the behaviour signals more about who they are, for example when it concerns many different behaviours or when the

behaviour is somewhat costly (Van der Werff *et al.*, 2014a). Engaging in relatively costly pro-environmental behaviour is more likely to signal that one really cares about others and the environment (Gneezy *et al.*, 2012).

The normative goal can also be strengthened when people make a commitment (or promise) to engage in pro-environmental actions. This implies that people explicitly commit themselves to the goal to act appropriately. Commitment strategies appeared to encourage people to act pro-environmentally (Abrahamse and Steg, 2013; Abrahamse *et al.*, 2005; Lokhorst *et al.*, 2013), probably because people are motivated to appear consistent and to act in line with their promise. Implementation intentions may help people to stick to their commitment to act pro-environmentally even when they encounter difficulties or encounter additional demands when the particular choice is made. Implementation intentions imply that people make if-then plans, in which they indicate how and when they will engage in planned pro-environmental actions, and how they would deal with possible barriers faced in a particular choice situation. By anticipating which barriers they may encounter, and thinking about how they would deal with such barriers, people are more likely to realise their set goal to engage in pro-environmental behaviour (Bamberg, 2002; Sheeran *et al.*, 2005). As such, implementation intentions neutralise the possibly disturbing influence of contrary goals in a given situation: the execution of the intention is virtually cut loose from the influence of possibly disturbing hedonic or gain goal effects.

Self-identity approaches, commitments, and implementation intentions all make use of people's desire to be consistent. It feels bad to be and to be seen as blatantly inconsistent, while it feels good to be or appear consistent. This implies that by the use commitments, implementation intentions, and strategies that strengthen one's environmental self-identity, the normative goal to act appropriately is likely to be supported by the hedonic goal to feel good in the background, providing another example of harnessing hedonic effects for normative behaviour.

Our reasoning implies that the relative strength of overarching goals can be changed by altering the choice infrastructure, thereby changing situational factors, which will affect the likelihood of pro-environmental choices. This reasoning provides a different rationale of why and how "nudging" (Thaler and Sunstein, 2008) can affect pro-environmental behaviour changes. A nudge has been defined as a friendly, little push

towards behaviour change by changing the choice architecture (Thaler and Sunstein, 2008), to address attentional or other biases people have. Our reasoning suggests that it is important to consider how and to what extent such changes in the choice infrastructure are likely to shift the relative weight of the three overarching goals, as this will have important implications for the likelihood of subsequent pro-environmental choices. For example, a fly in the urinal to prevent spillage could be effective in encouraging appropriate behaviour, but will at the same time probably strengthen hedonic goals (by making the appropriate behaviour fun to do), which may inhibit the likelihood of subsequent appropriate (such as pro-environmental) actions that are not pleasurable as such. In contrast, when situational factors (including nudges) signal that other people respect norms, the relative strength of the normative goal is likely to increase, which in turn increases the likelihood of subsequent pro-environmental actions.

4 Conclusion

We discussed the motivational dynamics of environmental behaviour. We described three overarching goals that affect behaviour: the hedonic goal to feel good, the gain goal to improve one's resources, and the normative goal to act appropriately. We indicated that the strength of these three goals depends on which values people prioritise, and on various situational factors. Values reflect people's preferences regarding the three overarching goals. Situational factors explain why preferences vary for the same person across time and situations, and why people not always act upon the values they prioritise. Intrinsic motivation is crucial for stable pro-environmental behaviour, but it is obligation-based intrinsic motivation, that is, behaviour motivated by a normative goal frame, that counts. Enjoyment-based intrinsic motivation serves pro-environmental behaviour best as a hedonic support of the normative goal frame from the cognitive background. We described various strategies to encourage pro-environmental actions. On the one hand, strategies can be aimed at reducing the conflicts between overarching goals in a given situation, so that the pro-environmental choice is not only the appropriate thing to do, but also a pleasurable and profitable option. On the other hand, strategies can be aimed at strengthening the normative

goal, thereby pushing hedonic and gain goals deeper into the cognitive background when they are incompatible with the normative goal, so that people are motivated to act appropriately even though this may be somewhat costly or not very pleasurable. The latter strategy is likely to promote durable and wide-scale changes in pro-environmental behaviour, but a broad spectrum of kinds of support for the normative goal and underlying biospheric values is needed to realise this.

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