

The “what” and the “why” of proenvironmental deeds: How values and self-determined motivation interact to predict environmentally protective behavior

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Abstract

Self-determined proenvironmental *motivation* is arguably the most important motivational resource for protecting the environment and supporting a sustainable lifestyle. At the same time, proenvironmental *behavior* evolves from multiple goals, values, and cues beyond self-determined motivation. In this chapter, I review the state of research on self-determination and values as they relate to proenvironmental behavior. I then sketch a framework to promote more widespread proenvironmental behavior by integrating motivation, values and goals, and social support. By understanding the manner in which values and motivation interact in predicting proenvironmental behavior, it becomes possible to identify sources of motivational conflict that lead to environmentally unsound choices. Through a process of aligning individuals’ values and motivation, strategies for intervention begin to emerge.

Keywords: self-determination; values; proenvironmental behavior; intrinsic goals; extrinsic goals

The “what” and the “why” of proenvironmental deeds: How values and self-determined motivation interact to predict environmentally protective behavior

Three decades of research have highlighted and validated the importance of self-determined motivation in promoting *proenvironmental behavior* (PEB; e.g., Pelletier 2002; Pelletier, Baxter, & Huta, 2011). The question now is not whether self-determination is vital to proenvironmental and sustainable behavior, but whether any other force – or combination of forces – is more vital. Because proenvironmental behavior is varied, complex, and often determined by multiple factors, it may be too simplistic to draw straight lines between any singular motivational construct and environmentally sustainable choices and actions (Masson & Otto, 2021). Thus, while overall connections between autonomous motivation and PEB (e.g., Lavergne, Sharp, Pelletier, & Holtby, 2010) and between intrinsic goals or values and PEB (e.g., Brown & Kasser, 2005) are important, researchers would be judicious to study and promote PEB using a more nuanced and integrated framework that combines motivation, values/goals, and social facilitation. In this chapter, I review self-determination theory research linking motivation and values to PEB, in the hopes of understanding when and why they play essential roles. In addition, I show how self-determination theory can help identify conditions under which values and motivation align to predict PEB, and when they conflict. By shedding light on these seeming discrepancies and working to resolve them, SDT can advance research toward more informed proenvironmental interventions and policies in the face of urgent and rapid climate change.

Using SDT to Understand and Predict PEB

Human beings, in all their bewildering inconsistency, continue to simultaneously exacerbate and serve as the possible antidote to some of the world’s most pressing ailments – including global climate change, environmental devastation, and food and water depletion. These serious environmental problems harm the biosphere and threaten to drain the basic nutrients for human life. Although destruction and consumption are wholly *human* ills that can be mitigated by human reparative behavior

(Dietz, Gardner, Gilligan, & Stern, 2009), PEBs are improving at a slower pace than required to stop climate change (IPCC, 2014). Many different PEBs are urgently needed, such as the adoption of renewable resources like solar power, the adoption of sustainable solutions like electric vehicles, the use of resource efficient goods and services, and the implementation of environmentally protective habits like saving energy and water, recycling, and reusing materials. This urgency begs the question of how to best motivate individuals to adopt PEB. Should people be mandated to comply with PEB in order to reduce the rate of environmental destruction as quickly and widely as possible? Or should people be supported and educated over time to promote the internalization of self-determined *proenvironmental motivation* (PEM)? The answer to this question first requires recognition that the route from environmental *motivation* to environmental *behavior* is not always clear.

PEM Does Not Always Lead to PEB (or: PEB is Not Always Caused by PEM)

A pressing question in environmental psychology concerns *why people engage in proenvironmental behavior*. Stern (2000) defines proenvironmental behavior (PEB) according to its positive impact on the environment and environmental systems, ecosystems, and the biosphere. As in any behavioral domain, the promotion of PEB requires a thorough understanding of the factors that predict it (e.g., de Groot & Steg 2010). Self-determination theory research on proenvironmental motivation (PEM), however, has not been concerned with understanding PEB per se but rather with the question of *why people are motivated to do things for the environment* (as well as how they can be encouraged to feel more self-determined in their proenvironmental motivation). The finding that PEM typically predicts PEB to a moderate degree (e.g., de Groot & Steg, 2010; Osbaldiston & Sheldon, 2003), although meaningful, does not capture the wide variability in PEB, and as such, the distinction between PEB and PEM is important to understand if research is to help address environmental degradation, depletion, and climate change in a flexible, wide-reaching, and timely way.

PEM, therefore, is undoubtedly best understood in SDT terms, as reflecting the degree to which PEBs stem from personally endorsed care and concern for the environment, or from the meaning and joy derived from doing things for the environment. Whereas some people may want to engage in environmentally friendly practices because they genuinely care about environmental sustainability, others may feel a sense of pressure or obligation to keep up with environmental behavior. In contrast, PEBs can take a wide variety of forms, and can range considerably in their multidimensionality (Mason & Otto, 2021; Stern 2016). Sometimes PEBs result from singular self-determined motivation to help the environment, and other times they are multiply determined, even in seemingly paradoxical ways. That is, PEBs can reflect the output of different (and sometimes competing) goals, motives, and cues, some of which reflect proenvironmental motivation and concern and some of which do not. For instance, the decision to donate time or money to an environmental organization is most likely strongly and uniquely determined by one's level of self-determined proenvironmental motivation (e.g. Sheldon, Wineland, Venhoeven, & Osin, 2016). After all, there is little reason to perform such sacrifice if one does not care about the cause. In contrast, the decision to purchase an environmentally sound electric vehicle might stem from self-determined proenvironmental motivation or, perhaps more likely, the desire to signal image and status (e.g., Noppers, Keizer, Bolderdijk, & Steg, 2014). The complex etiology and multi-categorizability of different types of PEBs is important to consider because PEB can sometimes be parenthetical to PEM – indeed, sometimes the motivation underlying PEB may not even be *environmental* per se – as in the decision to purchase an electric vehicle to signal wealth; or the adoption of solar panels because one's neighbors have done so; or even the saving of water and reduction of consumption in order to preserve the future health of others, which reflects *prosocial* rather than proenvironmental motivation. In short, there exist many practical and important reasons for performing environmentally protective behaviors – some of which may even be altruistic – that don't involve proenvironmental concern in itself (Howell 2013). The PEM-PEB connection thus suffers from a

sort of double paradox. On one hand, there exists a classic gap between environmental intent and action (Kollmus & Agyeman, 2002) where even proenvironmentalists sometimes behave in environmentally harmful ways. On the other, there is the finding that many highly impactful PEBs are performed for decidedly non-environmental reasons. From the perspective of SDT-informed education and intervention, this distinction between motivated concern for the environment and having a positive behavioral impact on the environment is important, because it means that encouraging proenvironmental motivation is not the same thing as encouraging proenvironmental behavior. And although self-determined proenvironmental motivation is never *unhelpful*, it is important to consider that there may be other avenues (both practical and prosocial) toward more widespread internalization of sustainable behavior.

First – a Review of the Importance of PEM in PEB

Pelletier and colleagues have made an enormous contribution to understanding the role of self-determined motivation in PEB; (e.g., Green-Demers, Pelletier, & Ménard, 1997; Lavergne, Sharp, Pelletier, & Holtby, 2010; Pelletier, Dion, Tucson, & Green-Demers, 1999; Pelletier & Sharp, 2008; Pelletier, Tucson, Green-Demers, Noels, & Beaton, 1998). Their work has shown consistently that those with a more autonomous or self-determined motivation to engage in proenvironmental behavior are more likely to actually do so, relative to those with external motivation or amotivation. In other words, when PEM is volitional and based on the personal importance of helping the environment, PEB is more frequent and lasting compared to when the underlying motivation is controlled – that is, driven by social pressure or external concern (e.g., engaging in PEB to gain prestige or approval from others; Green-Demers, Pelletier, & Ménard, 1997; Pelletier, Baxter, & Huta, 2011). Similarly, the more individuals view themselves as ecologically minded, the more self-determined their environmental motivation and behavior (Van der Werff, Steg, & Keizer, 2013). Research on self-reported household energy saving behavior even suggests that self-determined proenvironmental motivation is a more important

predictor of PEB than other psychological factors, including behavioral intentions, subjective norms, perceived behavioral efficacy, and past behavior (Webb, Soutar, Mazzarol, & Saldaris, 2013).

This basic effect of self-determined motivation on PEB has been validated across various environmental behaviors, including recycling behavior and purchasing decisions (e.g., Pelletier et al., 1998; Villacorta, Koestner, & Leves, 2003); interest in environmental issues (e.g., Seguin, Pelletier, & Hunsley, 1999); household energy-saving behavior (Joachain & Klopfert, 2014; Webb et al., 2013); lowered preference for materialistic goods (Kasser, Cohn, Kanner, & Ryan, 2007); and commitment to environmental activism (Sheldon et al., 2016). Moreover, researchers have attested to this basic connection in a variety of settings, including school (Legault & Pelletier, 2000), home (Webb et al., 2013), and work (e.g., Graves, Sarkis, & Zhu, 2013; Pelletier & Aiken, 2014).

One reason the quality of motivation matters in predicting PEB is that many PEBs are difficult and unpleasant. It takes effort and tenacity to make wise environmental decisions and sacrifice immediate comfort (e.g., driving to work) for environmental ideals (e.g., cycling or taking public transit to reduce overall fossil fuel emissions). Accordingly, research suggests that self-determined environmental motivation is more likely to predict the performance of difficult over easy PEBs. Early work on this idea showed that as environmental behaviors increased in perceived difficulty (i.e., recycling vs. purchasing environmentally sound products vs. learning about how to protect the environment), self-determined proenvironmental motivation became an increasingly important predictor (Green-Demers et al., 1997). More recently, Aitken, Pelletier, and Baxter (2016) found that self-determined PEM predicted taking public transportation when it was difficult to do so. In contrast, when transportation behavior was perceived to be easy, motivation type did *not* predict transportation frequency. Similarly, environmental activism, which involves high commitment in the face of frustration and uncertainty, is most strongly predicted by self-determined forms (esp. integrated and intrinsic) of environmental motivation (Sheldon et al., 2016). Research in tourism and outdoor recreation has shown

that self-determined motivation to protect nature can override the harmful effect of environmental constraints and barriers to proenvironmental behavior. For instance, if lodging and accommodations do not provide recycling services for guests or if campgrounds do not sell biodegradable soap, those with self-determined proenvironmental motivation are more likely to seek out environmentally sound solutions (Moghimehfar & Halpenny, 2016). Thus, self-determination in proenvironmental motivation is particularly important when PEBs are difficult, unpleasant, or face obstacles.

Self-determined motivation is also important in predicting PEB because it better equips people to deal with motivational inconsistencies common to environmental behaviors. Because PEBs can result from competing goals and often involve trade-offs between personal comfort and environmental sustainability, people sometimes fail to behave in line with their environmental concerns (Kollmus & Agyeman, 2002). Research by Lavergne and Pelletier (2016) suggests, however, that those with self-determined proenvironmental motivation are in fact less likely to encounter attitude-behavior discrepancy, relative to those with a controlled motivation toward the environment. Moreover, when such inconsistencies do occur, those with self-determined proenvironmental motivation are more likely to reduce this discomfort using active behavioral modification strategies, whereby they double-down on their proenvironmental efforts in order to align their behavior with their motivation. By contrast, those with a controlled motivation toward the environment are more likely to use the environmentally unsound strategy of cognitive restructuring – such that they reduce the importance of their proenvironmental concern to align with their less than sustainable behavior (Lavergne & Pelletier, 2015). This body of research helps to show that greater self-determination can help close the attitude-behavior gap – both by reducing the frequency of attitude-behavior inconsistencies and promoting behavior modification to manage discrepancies when they occur.

Facilitating Self-Determined Proenvironmental Motivation

Given the importance of self-determined PEM, it is necessary to understand the psychological

mechanisms and social and structural factors that support it. SDT research suggests that self-determined PEM is brought about through motivationally supportive climates. For instance, individuals demonstrate more self-determined motivation to help the environment when their basic psychological needs for autonomy, competence, and relatedness are met (Cooke, Fielding, & Louis, 2015). Similarly, adolescents are more self-determined in their proenvironmental motivation when their parents are autonomy supportive and show self-determined PEM themselves (Grønhøj, & Thøgersen, 2017), and when their peers support their freedom to make decisions about the environment (Villacorta et al., 2003). Importantly, citizens feel more autonomously motivated to do things for the environment when they perceive their governments to be autonomy-supportive rather than controlling in the implementation of environmental policies (Lavergne et al., 2010). This self-determined PEM, in turn, links to increased frequency of PEB, whereas controlled environmental motivation and amotivation do not (Laverge et al.). Others have underscored that people are more likely to engage in PEB when they identify with others who do so (Bamberg, Rees, Seebauer, 2015) – highlighting the importance of PEM-congruent contexts. Furthermore, evidence suggests that environmental education can both promote self-determined PEM (Legault & Pelletier, 2000) and reduce environmental amotivation (Darner, 2012).

An Intervention Workshop to Increase Self-Determined PEM

Despite clear evidence of the importance of interpersonal and educational contexts in promoting self-determined PEM, interventions focused on enhancing self-determined PEM are few. However, a recent randomized field experiment (Legault et al., 2020) offers initial encouragement. Legault et al. used principles of autonomy support and identified regulation to target students' self-determined motivations to save water and electricity while living in smart-metered apartments on campus. Students were randomly assigned to attend an intervention seminar where they were provided with information on various rationales for engaging in energy conservation, including climate change, environmental destruction, financial and economic concerns, energy security concerns, humanitarian

concerns, and health concerns. After the information session, participants selected the reasoning they most strongly endorsed, and wrote about its significance to them. Then, over the next three months, their electricity and water use was sensor-recorded at each fixture and faucet in their apartment. During this time, participants received reminders of their self-endorsed proenvironmental reasoning. A control condition comprised students living in the same type of smart housing but who did not receive the intervention. After accounting for baseline differences in water use, those who had received the self-determination intervention used 20% less water at the end of the three-month period.

In sum, SDT research on PEB has accrued a convincing body of evidence to suggest that self-determined motivation is important in understanding, predicting, and causing PEB – especially when PEB is constrained or challenging. Despite this clear evidence, proenvironmental motivation by itself does not appear to be the whole story in understanding and predicting the diversity and complexity of environmental behavior. Indeed, PEBs are multifarious and have multiple internal and external sources. Some have argued that human values or life goals may play an even more central role in proenvironmental behavior than motivation (de Groot & Steg, 2010; see also Hurst, Dittmar, Bond, & Kasser, 2013).

The Role of Goals and Values in PEB

Proenvironmental behavior is not self-interested in the same way as other self-focused motivational pursuits like personal health, education, work, religion, relationships, sports, or personal development. Rather, PEBs are often performed *in service of* environmental protection. Like altruistic or prosocial behavior, deep proenvironmental concern goes beyond both personal and contextual motivation – rather, concern and care for the environment is profoundly connected to broader goals and values. At the same time, PEB is equally likely to arise from cues, contexts, and beliefs that are not rooted in proenvironmental concern. That is, PEBs can be instrumental to the pursuit of non-PEB goals

and values. Because goals and values have the ability to capture such a range of PEBs, they have received extensive attention from environmental psychologists (e.g., Schultz & Zelezny, 1999; Steg, 2016; Stern & Dietz, 1994).

The Importance of Intrinsic and Biospheric Goals

Where PEM ranges in its degree of self-determination, values are more expansive “trans-situational *goals*...which serve as guiding principles” (Schwartz, 1992, p. 21). Although Schwartz (1992, 1994) describes 10 basic and universal human values, the fundamental duality between the self-transcendent values of universalism and benevolence (i.e., concern for the welfare of others) versus the self-enhancement values of hedonism, achievement, and power has received the most attention in the environmental domain. In addition, environmental psychology has expanded this prosocial/proself conceptualization to include environmental values, including the desire to protect the earth’s resources, to preserve nature, and to feel harmony with nature and other species. All told, four value clusters appear to be important for understanding environmental behavior because they shed light on what people prioritize (de Groot & Steg, 2008; Steg & de Groot, 2012). *Altruistic values* predispose people to focus on ways to benefit others. *Biospheric values* attune people to the needs of nature and the environment. *Egoistic values* drive the pursuit for personal wealth and status, and *hedonic values* prioritize personal comfort, ease, and pleasure. Research suggests that altruistic and biospheric values, which prioritize service to the collective, positively predict proenvironmental intentions and behaviors (Cameron, Brown, & Chapman, 1998; Gärling et al., 2003; Joireman, Lasane, Bennet, Richards, & Solaimani, 2001) – although biospheric values more strongly so (de Groot & Steg, 2010; Steg & de Groot, 2012; or see Steg 2016 for a review). In contrast, egoistic and hedonic values are, in general, negatively associated with PEB – probably because PEBs are often personally costly or arduous (e.g., Nordlund & Garvill, 2002; Steg, Perlaviciute, Van der Werff, & Lurvink, 2014) Stern & Dietz, 1994).

SDT research on goals and values contributes to this picture. For instance, those who hold intrinsic goals of community and self-expression are more likely to espouse pro-ecological attitudes and support for sustainability than those who emphasize extrinsic goals related to image, fame, and wealth (Sheldon, Nichols, & Kasser, 2011). And when reminded of their intrinsic values, individuals are more willing to pay to protect the environment compared to those reminded of their extrinsic values and those in a neutral condition (Ku & Zaroff, 2014). In contrast, those who hold extrinsic values make more selfish rather than proecological decisions (i.e., in a resource dilemma; Sheldon & McGregor, 2000), and have higher ecological footprints than those who place a low priority on materialism (Brown & Kasser 2005). Indeed, materialism and the preference for extrinsic values was consistently linked to less proenvironmental behavior in a meta-analysis ($r = -0.24$ across nine studies; Hurst et al., 2013).

Do intrinsic and biospheric values cast a wider net of PEBs than self-determined motivation?

Because of their ability to predict a wide variety of PEBs, some work has shown that the values model can explain independent variance in PEB beyond that explained by self-determined motivation (De Groot & Steg, 2010). This may be because PEBs themselves are widely variable and multiply categorizable, meaning that the *intention* that results in the PEB and even sometimes the motivation to adopt a proenvironmental lifestyle in general is not always driven by self-determined proenvironmental motivation per se. Thus, although in general the biospheric component is the strongest predictor of PEB (Steg 2016; Steg & de Groot, 2012), intrinsic goals are also uniquely important in predicting PEB, suggesting that many PEBs arise from non-biospheric concerns. Said differently, proenvironmental choices and actions often serve *prosocial* rather than *proenvironmental* goals. In an exploratory mixed methods study investigating the values, motivations, and routes to engagement among those adopting lower-carbon lifestyles, Howell (2013) found that the most commonly reported reasons for engaging in environmentally friendly lifestyles involved intrinsic goals – including social justice, human rights, community, and personal integrity – not concern about the state of the environment per se. A major

theme drawn from participants' reports was a worry about others who would be systematically disadvantaged or harmed by climate change. Thus, while biospheric values and ecological concern were important, they were not the *most important* in determining a low-carbon lifestyle – rather, altruistic and intrinsic values were. In terms of determining PEB, these intrinsic goals were also rated more highly than the desire to be in nature or to have positive experiences in nature. Similarly, in the aforementioned motivational intervention to promote energy and water conservation in student residences (Legault et al., 2020), participants were provided with six classes of rationales for engaging in conservation behavior (several of which concerned environmental protection; one of which reflected financial savings; one of which concerned personal and public health; and one of which concerned the wellbeing and growth of future generations); the most important rationale capturing students' desire to engage in PEB was intrinsic/altruistic rather than biospheric and proenvironmental – it was to preserve the welfare of future generations.

Although neither prosocial nor proenvironmental in nature, *frugality* is another value and goal that seems to drive PEB because it entails general restraint and respect for resources (Fujii, 2006; Kasser, 2002). While frugality is not based in morality/prosociality per se, it does demand significant self-control in acquiring and using economic goods and services (Goldsmith & Flynn, 2015), and links to a simple and sustainable lifestyle (Howell, 2013). Interestingly, research has shown that waste reduction is connected to frugality rather than environmental concern (Gatersleben, Murtagh, Cherry, & Watkins, 2019). Similarly, Thøgersen (2018) notes that both frugality and proenvironmental concern explain unique variance in energy saving behavior. Moreover, when comparing environmental concern with frugality and ease of use, Fujii (2006) finds ease of the PEB predicts most PEBs, but only frugality is associated with gas and electricity reduction. Frugality and low materialism, therefore, seem to be important for reducing one's carbon footprint – but out of restraint and simplicity rather than biospheric values or self-determined motivation toward the environment (Howell, 2013).

Thus, when predicting PEB, intrinsic and biospheric values are unique and separable in their importance, and together may provide a wider understanding of PEB than self-determined PEB alone. This highlights two avenues for future work in SDT: 1) to include ecological and frugality goals in addition to intrinsic and extrinsic goals when studying different PEBs, and 2) to expand the link between motivation and PEB to include both prosocial and practical motivation rather than focusing only on proenvironmental motivation. These findings also suggest that climate change mitigation and proenvironmental messaging should endeavor a broader promotion of human rights, as well as social and environmental justice, rather than a narrow focus on environmental protection alone.

The Seemingly Paradoxical Importance of Extrinsic Goals

Evidence suggests that people engage in cost-benefit analysis when making environmental decisions, and how these costs and benefits are weighted influences behavior (Steg 2016). In general, those with extrinsic goals make more harmful environmental decisions because personal comfort is prioritized and proenvironmental behaviors are often personally costly or effortful/difficult (Lindenberg & Steg, 2007). Nonetheless, researchers must acknowledge that many studies have found positive associations between certain PEBs and either extrinsic goals or controlled proenvironmental motivation (e.g., Koo & Chung, 2014). Indeed, sometimes environmental choices that are egoistic or status-motivated in nature result in very positive environmental consequences. For instance, when people want to enhance their status and image, they are more likely to adopt sustainable innovations, like purchasing electric vehicles (Schuitema, Anable, Skippon, & Kinnear, 2013) or installing rooftop solar panels (Legault, Bird, Hotaling, & Heintzelman, in prep). And, for those motivated to demonstrate their status, proenvironmental adoptions become increasingly attractive as they become increasingly expensive and more publicly conspicuous (Griskevicius, Tybur, Van den Bergh, 2010) – further demonstrating that certain proenvironmental deeds are driven by materialistic and egoistic values.

In a recent study of 800 single-dwelling homeowners, Legault et al. (in prep) evaluated the predictive strength of values and self-determined motivation in determining whether homeowners decided to install rooftop solar panels on their homes – which is among the most environmentally beneficial residential behaviors. Results showed that extrinsic values were the strongest unique predictor of rooftop solar adoption, even among those with high levels of environmental motivation (Legault et al., in prep.). This finding may not be so surprising considering the U.S. Green Building Council markets solar adoption mainly by emphasizing economic incentives rather than proenvironmental care (Holowka, 2017). Similarly, others have found that willingness to adopt green information technology (e.g., smart devices to save resources in the home) was more strongly connected to external goals, that is, those concerned with saving money, than with internal motivations to help the environment (Koo & Chung, 2014). In many cases, PEBs can serve to signal economic status and the ability to make monetary ‘sacrifices’ for green initiatives (Steg, 2016). These findings underscore the need to better understand when extrinsic factors protect the environment and when they harm it. From an SDT perspective, it is likely that materialistic values positively link to specific PEBs only when those PEBs serve extrinsic goals, but that these values do not translate to other proenvironmental behaviors or to the adoption of an ecologically sound lifestyle. In our investigation of the motivational profiles of solar panel adopters, although extrinsic values predicted solar panel adoption specifically, they did not link to general proenvironmental habits (Legault et al.).

To underscore, although research tends to draw straight lines between either values and PEB or motivation and PEB, these simple explanations fail to consider the diversity of PEBs. Indeed, meta-analyses suggest these bivariate links are modest to moderate (e.g., Hurst et al., 2013). Although some PEBs may be so effortful and definitively proenvironmental that they can only be achieved through highly self-determined motivation to protect the environment (e.g., Green-Demers et al., 1997), other PEBs are rooted in many possible explanations, including intrinsic and extrinsic goals, as well as

situational facilitation and constraint (Gaspar, 2013). Environmental values and motivations rarely exist in isolation; hence it is useful to consider the ways in which they interact in predicting PEB. By uncovering sources of misalignment between values and motivation, it becomes more feasible to develop strategies to promote PEB – because points of mismatch might suggest avenues for intervention.

The Need to Consider Both Goals and Motivation when Predicting PEB

According to SDT, the motivational content of goals (the “what”) is distinguishable from the motivation for pursuing them (the “why” of goals; Deci & Ryan, 2000). Thus, although it is common and typical for intrinsic values or goals to generate more self-determined motivation and for extrinsic values or goals to elicit more controlled motivation, there is nonetheless a theoretical distinction between values and the motivational processes by which those values are sought (Deci & Ryan, 2000; Martela, et al. , 2020). The implication here is that goals and motivation might sometimes match (e.g., intrinsic goal of valuing environmental protection to save future generations AND self-determined motivation to do things for the environment, like recycling and reusing goods), and sometimes conflict (e.g., intrinsic goal of valuing environmental protection to save future generations AND amotivation regarding the usefulness or feasibility of a specific behavior).

When Values and Motivation Align

Values give rise to motivations. Individuals espousing intrinsic and biospheric values are indeed more likely to be self-determined to do things for the environment. De Groot and Steg (2010) examined interrelations among egoistic, altruistic, and biospheric value orientations and all six types of proenvironmental motivation (i.e. intrinsic motivation, integrated regulation, identified regulation, introjected regulation, external regulation, and amotivation). They found that the more participants were altruistically and biospherically oriented, the more they were self-determined to do things for the environment, and conversely, more egoistic values were linked to less self-determined forms of

environmental motivation. Similarly, Baxter and Pelletier (2020) distinguished between motivation and intrinsic/extrinsic goal orientation in predicting sustainable behavior in a resource dilemma – where the objective was to catch and sell as many fish as possible while also preserving the health of the fish population. They found that when participants demonstrated self-determined PEM *and* intrinsic/prosocial goals of sustainability, they showed the most desire to maintain or grow the fish population. In our lab’s research on the link between values and motivation, more socially liberal values (e.g., social justice) predicted more self-determined PEM, whereas more socially conservative values predicted controlled environmental motivation and amotivation. In turn, self-determined, but not controlled motivation, predicted PEB (Sherman, Rowe, Bird, Powers & Legault, 2016).

Thus, when values and motivation align such that intrinsic and biospheric goals match behavioral opportunities to express self-determined proenvironmental motivation, PEB is likely. As Steg (2016) notes, people are likely to consistently and repeatedly act in proenvironmental ways when they strongly endorse biospheric values and their proenvironmental motivation can express itself unfettered by competing contextual factors.

When Values and Motivation Alternate in Importance

Values and goals are likely to affect motivation toward and endorsement of proenvironmental choices; those with altruistic and biospheric values will often engage in proenvironmental behavior – even if it involves some personal sacrifice – because it helps others or the environment. Similarly those with self-determined motivation toward PEB are particularly likely to engage in effortful PEB because they are environmentally concerned. Conversely, those with strong hedonic and egoistic values will undertake proenvironmental behavior when it is easy, pleasurable, financially beneficial, or when it signals or enhances their status; but not if it is personally uncomfortable or unconnected to extrinsic goals (Steg & de Groot, 2012).

Recently, Masson and Otto (2021) extended this basic framework to suggest that the extent to which values versus self-determined motivation predict PEB may depend on the extent to which they *match* the specific goals of the environmental behavior in question. In other words, whether values versus level of self-determined proenvironmental motivation predicts a given PEB depends on the different proenvironmental and personal goals linked to or required by that behavior. For instance, when choosing a lightbulb or a vehicle, environmental conservation might be one of many different personal and environmental goals connected to that choice, in addition to safety, quality, status, functionality, and so on (Otto, Kaiser, & Arnold, 2014). As Masson and Otto (2021) propose, personal values might provide a large number of different reasons (in different domains) to perform a given behavior, but proenvironmental motivation has one major aim – which is to reflect the level of self-determination in proenvironmental striving. Thus, when a given environmental behavior is multiply determinable, that is, when it has the potential to be explained by any number of personal goals or values (as in the decision to purchase an electric vehicle or install solar panels), then values might be better predictors of decision-making. In contrast, when the behavior in question is more narrowly understood as stemming from proenvironmental concern, as in the decision to engage in environmental activism or the desire to read books on sustainability, then level of self-determined motivation is more likely to be a stronger predictor of behavior. In other words, if the behavioral domain invokes many possible motivations, environmental motivation will become less important, overall. If the behavioral domain is purely environmental, then environmental motivation will play a stronger role than will broader values. All told, self-determined motivation toward the environment is most predictive of PEB when it is closely guided by its proenvironmental end-state.

In support of these ideas, Masson and Otto (2021) found that self-determined motivation rather than values predicted environmental activism – as measured by frequency of boycotting companies that harm the environment, searching for information about environmental issues, pointing out

environmentally damaging behavior to others, and donating to an environmental organization. In contrast, proenvironmental mobility behavior – defined as the tendency to use public transit or walk instead of drive – which could be construed as proenvironmental but also may be contingent on various alternate goals like health or frugality, was predicted by low extrinsic goal prioritization, but unrelated to self-determined motivation. When Green-Demers and colleagues (1997) and Aiken and colleagues (2016) found that self-determined PEM linked to difficult PEBs but not easy ones, it may be because difficult PEBs are more quintessentially proenvironmental (e.g., when public transit use is difficult, it requires environmental motivation, but when it is easy, people may do it for lots of reasons).

When Values, Motivation and Behavior are Misaligned: The Need for Social Support

As suggested in Table 1, when environmental goals and motives align, PEB should follow from congruent motivational processes (Baxter & Pelletier, 2020; Steg, 2016). However, misfit arises when values or goals are not reflected in proenvironmental motivation or behavior (e.g., Kollmuss & Agyeman, 2002; Kormos & Gifford, 2014). Indeed, PEBs can activate multiple goals and motives at a given time and these may or may not be compatible (Lindenberg & Steg, 2007). These theoretical discrepancies illuminate potential behavioral and situational sources, and thereby possible avenues for proenvironmental interventions. In particular, these inconsistencies emphasize the need to align values, goals, and motivations in specifically tailored ways depending on the nature of the motivational conflict.

For instance, when individuals prioritize intrinsic values but their motivation toward the environment is non self-determined, they likely require support in reframing the PEB as prosocial rather than solely proenvironmental. In line with this idea, Unsworth and McNeil (2017) asked individuals to connect specific PEBs, including sustainable energy use and commuting behavior, to their personal goals – even if those goals were unrelated to climate change or the environment. When participants engaged in this reflective exercise, they showed greater intentions to save energy and take public transit compared to those exposed to a persuasion attempt based on climate change threat.

In contrast, when biospheric and ecological concerns are generally high, but specific environmental motivations are impoverished or lack self-determination, this suggests that social support or facilitation is needed to illuminate the connection between ecological concerns and the ecological relevance of the behavior. If alternate immediate goals and motives interfere with more deeply held biospheric values, then it may simply be a matter of strengthening the preexisting environmental concern. This might be done by communicating that the PEB is valued or integral to biospheric ideals (e.g., Graves et al., 2013). Alternatively, this type of motivational struggle might be solved by decreasing the value of competing extrinsic or hedonic motives or reducing the effort or extrinsic cost of the proenvironmental choice by making the PEB easier or more enjoyable (e.g., Steg, Bolderdijk, Keizer, & Perlaviciute, 2014).

Table 1. Theoretical Sources of Goal-Motive Fit and Discrepancy in PEB

	Intrinsic Goals (e.g., community)	Extrinsic Goals (e.g., money, image)	Biospheric Goals (e.g., protecting nature)
Self-Determined Proenvironmental Motivation	Mostly Congruent (High PEB)	Misfit (Less reliable PEB) Solution: Reduce extrinsic costs of PEB	Congruent (High PEB)
Non self-determined Proenvironmental Motivation	Misfit (Low PEB) Solution: Activate prosocial motivation and align with PEM	Congruent (High PEB but only for specific PEBs that serve extrinsic goals)	Misfit (Low PEB) Solution: Nudge motivation to match values through social support
Amotivation toward the Environment	Misfit (Low PEB) Solution: Activate prosocial motivation and align with PEM	Somewhat Congruent (Low PEB) Solution: Connect PEB to extrinsic goals (PEB will remain goal-based)	Misfit (Low PEB) Solution: Nudge motivation to match values through social support

Note. Sources of misfit likely originate from the behavioral characteristics of the PEB in question (i.e., is it multiply predictable from different types of goals/values?) as well as situational cues and contextual supports vs. impediments. Intrinsic and biospheric goal misfit (in grey) highlight the need to align environmental behavioral intentions and cues with underlying values. Extrinsic goal misfit (in black) suggests the need to either reduce egoistic and hedonic costs associated with the PEB or de-emphasize the value of the extrinsic gain attached to the PEB.

The case of extrinsic goal conflict is somewhat less clear. Research shows that when individuals prioritize extrinsic values, PEB is likely only to the extent that it serves their egoistic and hedonic motives, and not when it is personally costly (Lindenberg & Steg, 2007). Thus, when the specific

motivational requirements of the PEB in question are easy and pleasurable or when they signal wealth and image, then values and motives align and PEB will be temporarily maintained for as long as extrinsic values can be expressed or gratified. On the other hand, it is very unlikely that those with strong extrinsic goals will engage in environmentally sound behavior for the environment's sake – such as when it requires self-determined environmental motivation and concern. In these cases, interventions, messaging campaigns, social figures, and policymakers are faced with limited options. They might simply link the PEB to egoistic and hedonic priorities. Although this practice is very common in green marketing (e.g., Holowka 2017), it also reduces the likelihood that environmentally sustainable behavior will fully develop (Ryan & Deci, 2019). Conversely, they might attempt to activate intrinsic or biospheric values, assuming those value structures are extant to begin with (a much more challenging endeavor since values are hard to change; Stern & Dietz, 1994). Another more sustainable option might be to reduce the degree to which the PEB infringes on personal gain and comfort (e.g., Steg et al., 2014).

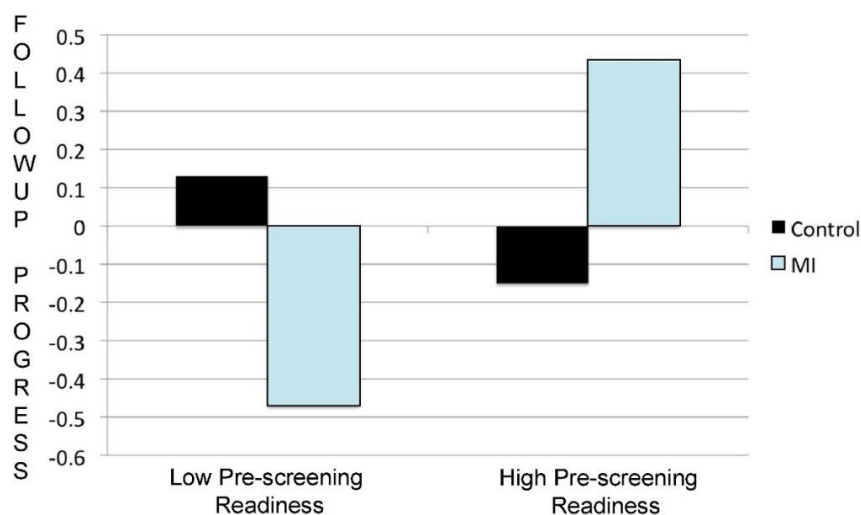
Person-Intervention Fit

Empirical research corroborates the importance of aligning interventions and contextual cues to an individual's type of motivation (e.g., Ferguson & Sheldon, 2010). Recently, Hicklenton, Hine, and Loi (2019) demonstrated that when organizations espouse intrinsic, extrinsic, or biospheric values that match employees' own values, employees feel more satisfied and committed compared to when employer-employee values do not match. When it comes to PEB, Tagkaloglou and Kasser (2018) suggest that motivational fit can help people engage in collective environmental activism – an arguably difficult and effortful PEB requiring sustained involvement in groups and networks that seek to make environmental progress. The authors assigned participants to undergo motivational interviewing (Miller & Rollnick, 2013) – which consisted of a single personalized counseling session to strengthen and internalize their motivation to engage in collaborative activism – or a more directive instruction on how

to engage in activism. They then measured how much progress participants had made on their activism goals seven weeks later.

As depicted in Figure 1, an interesting interaction emerged, where the effect of motivational interviewing on goal progress depended on participants' baseline level of environmental care and concern. For those who cared about the environment (which, as the authors noted, reflected *readiness to change*), the motivational interviewing resulted in more activism progress than did the directive instruction. But, for those with low environmental concern, the opposite result emerged; that is, the directive approach worked better than the motivational interviewing. Thus, collaborative environmental activism, which represents a particularly self-determined PEB, increased when underlying values matched the motivational approach; greater environmental values lead to greater environmental activism through the support of self-determined motivation. In contrast, those with little biospheric concern made no progress on their goals when they were motivated using motivational interviewing – presumably because they had no self-determined environmental motivation to begin with. These participants fared better when the motivational approach matched their low environmental concern.

Figure 1. Effect of Motivational Interviewing (MI) and Directive Instruction (Control) on Environmental Activism Goal Progress for those High and low in Environmental Readiness to Change.



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In sum, analysis of the interrelations among values and self-determined PEM is a fruitful way to understand how to motivate PEM. When people hold biospheric or intrinsic values, then the promotion of PEB is a matter of emphasizing or connecting values to behavior through proenvironmental or prosocial motivation respectively. In contrast, extrinsic goals and non self-determined motivation tend to predict specific PEBs only when those PEBs serve to express or uphold materialistic ideals. When PEBs require effort, personal sacrifice, or self-determination to be integrated into an environmentally sound lifestyle, appealing to environmental or prosocial goals and concerns may be unproductive. Empirical findings underscore the importance of using social support and motivational interventions that align with individuals' underlying goals, in order maximize proenvironmental behavior.

Conclusion

Why do people engage in proenvironmental behavior and how can they be encouraged to do more to protect the environment? Analysis of the evidence presented here suggests that our most valuable motivational resource for environmental protection is self-determined motivation that springs from biospheric goals (e.g., Baxter & Pelletier, 2020). However, many people prioritize intrinsic and extrinsic values over biospheric ones. Whereas intrinsic values can also predict a sustainable lifestyle through the motivational pursuit of prosocial and prudent rather than strictly proenvironmental goals, extrinsic values and controlled environmental motivation pose a threat to environmental protection. Given that values change slowly and unreliably, as well as the fact that PEBs are multi-motivational – often reflecting proenvironmental, pro-self, and prosocial goals and values – there cannot be a one size fits all approach to increasing PEB. Instead, social figures, societal structures, and motivational interventions would be well-served to tailor messaging and support to align motivational strategies with underlying values in order to maximize PEB in the face of rapid environmental destruction.

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