

Review

Understanding the Reasons for Behavioral Failure: A Process View of Psychosocial Barriers and Constraints to Pro-Ecological Behavior

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Abstract: For many years now, behavior change projects and research on pro-ecological behavior seem to have encountered difficulties in answering the question: why do people fail to act? That is, what are the barriers and constraints that prevent people from acting in a pro-ecological way? In order to fill the gap, this paper aims to operationalize the concepts of barriers and constraints, based on an approach that considers the role of behavioral goals (“to achieve X”). In addition, it aims to present a preliminary approach focused on understanding the processes involved in the barriers and constraints emergence and their consequent effect on the implementation of behavioral goals into behaviors. This is done in order to allow for a better understanding of: (1) how the interaction between individual/dispositional characteristics and the characteristics of the situation in which individuals are in, may result in the inhibition/constraining of pro-ecological goals implementation into behaviors; and (2) the role of conscious and unconscious processes in this. Examples of barriers and constraints will be given, in order to make salient the need for future research to address these and for behavioral change projects to take them into consideration.

Keywords: ecological behavior; psychosocial barriers and constraints; unconscious processes

“If we ask a man who is exploiting a commons to desist ‘in the name of conscience’, what are we saying to him? What does he hear?—not only at the moment but also in the wee small hours of the night when, half asleep, he remembers not merely the words we used but also the nonverbal communication cues we gave him unawares? Sooner or later, consciously or subconsciously, he senses that he has received two communications, and that they are contradictory: 1. (intended communication) ‘If you don’t do as we ask, we will openly condemn you for not acting like a responsible citizen’; 2. (the unintended communication) “If you do behave as we ask, we will secretly condemn you for a simpleton who can be shamed into standing aside while the rest of us exploit the commons.” ([1], p.1246)

1. Introduction

Attempts at persuading people to change their ecological behavior “in the name of conscience” are often prone to failure ([1]). This happens even when they have the “right” attitudes, knowledge and motivation to act pro-ecologically (see e.g., [2]). Several of these “right” psychosocial factors—the positive determinants of ecological behaviors—have been identified in the literature (see e.g., [3–7]). However, a few exceptions notwithstanding [8–10], the reasons for failure have not.

The lack of identification of these can be due to a “positivity fallacy”, which implies the belief that “as long as people develop the right attitudes, intentions, skills, information, *etc.*, the right pro-ecological behavior should follow” ([11], p.270, see also [12]). Given this, if people do not do what they are asked to do, that is because they consciously chose not to and thus, they are “condemned” for not acting like a responsible citizen [1]. However, this is an example of the fundamental attribution error: ecological behavior is considered to be caused by individual characteristics and dispositions when in fact it can also be caused by characteristics of the situation or context where the individual is in [12]. Based on this error, practitioners and researchers may fail to recognize situational factors that can constrain or inhibit pro-ecological behavior, thus attributing failure to the individual. In addition, the lack of identification might be due to the lack of consideration and comprehension of the unconscious factors role. As referred by Hardin ([1], p.1246): “Sooner or later, consciously or subconsciously, he senses that he has received two communications and that they are contradictory”. Although the influence of unconscious factors has been recognized both implicitly (as in [1]) and explicitly (see e.g., [13]) in the literature on ecological behaviors, the processes that underlie this influence are far from understood. Thus, the question remains: why do people fail to act?

Accordingly, the literature presents more examples of descriptive rather than process approaches. In this regard, it is considered here that process approaches focus on the mental activities associated with cognitive, social and emotional dimensions of human functioning, and explain the (1) conditions for them to take place and interact in a conscious and unconscious way; and (2) their role in mediating/moderating the influence of 2.1) characteristics of the physical and social environment (situational) and 2.2) individual characteristics (dispositional), over people’s behavioral goals/intentions and behaviors. Differently, descriptive approaches focus on the mental activities associated with cognitive, social and emotional dimensions of human functioning, identifying the presence or absence of factors/variables/characteristics that may predict the ecological actions occurrence (but that do not explain the conditions in which this occurs nor the processes that take place in in this regard).

In order to fill this gap, a process view of psychosocial barriers and constraints is proposed here, which aims to allow for a better understanding of: (1) the interaction between dispositional and situational characteristics that might inhibit/constrain the implementation and maintenance of pro-ecological behaviors; and (2) the role of unconscious factors in this.

2. Defining Barriers and Constraints on Pro-Ecological Behaviors

Hardin's ([1]) example of intended and unintended communication aimed at persuading people to act pro-ecologically, mirrors what can be found in projects and actions that aim to promote pro-ecological behaviors. On one hand, communication in these focuses on persuading people to achieve one or more pro-ecological behavioral goals—*i.e.*, goal(s) to act pro-ecologically. While this can promote or strengthen existent pro-ecological goals, on the other hand, it can also induce a conflict with existent anti-ecological goals. For example, a person's pro-ecological goal to save water for ecological reasons, implemented by limiting water consumption while taking a shower or other activities, might conflict with the goal to achieve personal comfort, implemented through water expenditure. Under this scenario, the latter can be more rewarding (internally or externally) to engage with than the ecological goal and thus, reduce the intention to implement this goal. As a consequence, the probability of failure in behavioral change and maintenance increases (see e.g., [14]). This implies a goal-based view of ecological behaviors (see e.g., [15]), in which goals are defined as mental representations of desired states, such as a behaviors or behavioral outcomes, that it is rewarding to engage in or to attain [16,17].

Following this goal based view, Gaspar *et al.* [11] defined the reasons for behavioral change and maintenance failure as psychosocial factors that can: (1) lower the activation strength of pro-ecological goals (interference) and/or increase the activation strength (facilitation) of anti-environmental goals—*behavioral constraints*; (2) inhibit the activation of pro-ecological goals—*behavioral barriers*. This differentiation is based on the goal activation/inhibition effect's magnitude. Accordingly, if these factors interaction with the behavioral goals produces a facilitation or interference effect, they have a constraining effect over pro-ecological goal(s). Nevertheless, the pro-ecological behavior can still occur (e.g., occasionally or under specific circumstances). If an inhibition effect is produced, they work as barriers and thus, the desired pro-ecological behavior will not occur.

This distinction between barriers and constraints in terms of the effect's magnitude, is based on the idea that ecological behavior is guided by multiple motives (e.g., [12,18]). Given that multiple goals co-occur, often environmental decisions are made under a state of (conscious or unconscious) goal conflict, as referred above. When there are multiple goals competing, only the "winning" goal will be implemented into behavior, *i.e.*, will reach the goal operation phase [19]. Which goal "wins" this conflict depends on how the barriers and constraints interact, based on the characteristics of the individuals and the surrounding context in which the behavior is expected to occur. This is supported by the Goal Systems Theory [19], which claims that accessible goal alternatives or "background" goals (e.g., anti-ecological) can pull away resources from a focal goal (e.g., pro-ecological), for example by reducing its activation strength. Other negative effects include: undermining the commitment to the focal goal, hampering progress toward the goal, hindering the development of effective means for goal pursuit and dampening people's emotional responses to positive and negative feedback about their goal striving efforts [19,20]. Although demanding selective attention to the relevant contextual/internal cues, these processes often occur outside awareness [16].

As an example of the above, unrealistic optimism about environmental degradation [21] or uncertainty about resources level of availability and of how many people are cooperating in a pro-ecological way [22,23] can be considered behavioral constraints. This is because they can have a

goal interference effect by reducing the goal intention commitment (e.g., “I intend to save water while taking a shower”) and the pro-ecological goal strength. Moreover, they can have a facilitative effect over anti-ecological behaviors activation. Differently, the existence of a habit of “spending much water while taking a shower” (including a small set of behaviors like not turning off the water while using the shower gel or soap, for example), might work as a barrier. Rather than just decreasing the strength, this implies the complete inhibition of the pro-ecological goal of “saving water while taking a shower” (see [24] for a similar example, with regard to organic and non-organic food consumption).

Various factors can have this inhibitive/constraining or facilitative effect on pro-ecological and anti or non-ecological goals respectively and consequently, on their operation, *i.e.*, on their implementation through behavior. However, most research and models of ecological behavior proposed in the literature do not focus on them but rather on factors that can have a facilitative effect over pro-ecological goals (see e.g., [3–7]). These can only be detrimental to pro-ecological behaviors if they are absent or their strength is low-lack of positive determinants—and thus they do not fit with the definition of barriers and constraints-negative determinants—presented. The latter have been given less attention in the literature than the former. However, by only identifying the positive determinants, we run the risk of having a lower understanding of the reasons for behavioral change and maintenance failure. Nevertheless, the literature presents some exceptions in this regard, which will be presented next.

3. Models of Barriers and Constraints

An example of a theoretical approach focused on pro-ecological behavior barriers and constraints is provided by Tanner [10] based on the Ipsative Theory of Behavior (e.g., Frey, 1989; cited by [10]). This approach identifies three general classes: (1) *Ipsative Constraints*—includes internal factors that prevent the activation of a particular behavioral alternative from occurring. This implies that the action can only be performed if the individual remembers to perform it, *i.e.*, if it is cognitively accessible to consciousness. If this is not the case, then the individual only takes into consideration a limited number of behavioral options, in which the pro-ecological option might not be one of them; (2) *Subjective Constraints*—includes perceived factors that inhibit the preference for a particular behavioral alternative or willingness to act. This can include, for example, beliefs of what is possible or not, desired or not, or allowed or not, thus influencing the deliberation about which is the best behavioral alternative to choose; (3) *Objective Constraints*—includes external or situational factors that prevent the performance of a particular behavior alternative from occurring. These are considered as independent from the individuals’ perception and include: lack of opportunities, mental and physical disabilities, low income, influence of legal and political institutions, *etc.* Although the latter constraints were considered to be non-psychological in nature, their effect over behaviors is mediated by psychological processes (for an example, see Kaiser and Keller [25], and Klöckner and Matties [26]). Moreover, there is an idiosyncratic dimension given that, for a person not owning a car might be perceived as a barrier but for another it might not be, as he/she can engage in “carpooling” or renting.

Another approach found in the literature, is Gifford’s [8] “Dragons of Inaction” or psychological barriers that limit climate change mitigation and adaptation. Twenty nine types of barriers were identified and grouped into seven categories: (1) *Limited cognition*—related with the bounded rationality and limits to information processing faced by humans, including barriers such as for

example the “ancient brain” (e.g., limited capacity to process information about the distant future) “ignorance” (lack of knowledge about problems existence, about what actions to take and climate change causes and extent) and “environmental numbness” (limited capacity to monitor complex and diverse information about the surrounding context); (2) *Ideologies*—related with beliefs such as for example “technosalvation” (e.g., belief that technology, and not individual actions, will solve climate change problems) and “system justification” (the tendency to defend the system and the “status quo”, which prevents people from acting against it); (3) *Comparison with others*—including for example “social comparison” (comparison between own actions and the actions of others, deriving descriptive norms from this, regarding what is the “proper” thing to do) and “perceived inequity” (implying the perception of different demands to different individuals, that might be perceived as unfair, e.g., “why should I change if others do not?”); (4) Sunk costs—related to perceived losses in terms of money, time and lifestyle, such as “financial investments” (e.g., people have a tendency to avoid losses and thus, if they bought a car might think that using the public transport is throwing money away) and from “conflicting values, goals and aspirations” (pro-environmental values positively influence behavior unless they are incompatible with people’s own values, aspirations and other goals); (5) Discredence—related to perceiving the views of other people in a negative way and/or discounting them, including for example “denial” (of climate change occurrence, of its causes being human or that one’s own actions play a role in it) and “reactance” (reacting against advice or policy that is perceived as a threat to their personal freedom, e.g., in the form of “you are forbidden to do X”); (6) Perceived risks—the perception of a threat to self and others, from acting pro-environmentally, including “functional”, “physical”, “financial”, “social”, “psychological” and “temporal” risks; (7) Limited behavior—related for example with doing the minimum required actions, when much more could be done, including “tokenism” (adopting more low cost and easy, than high cost and difficult actions).

Gifford and Tanner’s approaches consider the different roles of external and internal constraints and the role of conscious and unconscious socio-cognitive processes (although not explicitly referred in [8]). However, they present a descriptive view rather than an explanation of the processes involved. One exception in this regard, is Kollmuss and Agyeman’s model [9]. Although being descriptive, they also attempt at explaining how the different factors influence one another and behavior. Two classes of behavioral antecedents are identified: (1) *Internal factors* - including personality traits, the value system and environmental consciousness, in association with knowledge, emotional factors and attitudes; and (2) *External factors*—including infrastructure, social and cultural factors, economic situation and others. At the internal level, they identify barriers such as for example: existing values and knowledge that prevent learning and emotional involvement; lack of knowledge; emotional blocking of new knowledge, and of environmental values and attitudes. The interaction between these barriers at this level also produces other barriers such as lack of internal incentives and of environmental consciousness; or negative or insufficient feedback about behavior. At the external level, barriers mostly refer to the lack of external possibilities and incentives. Both the lack of internal and external incentives, interact also with an additional barrier, which is the closest to behavior and presumably the strongest: “old behavioral patterns”. Although in the literature the latter are included in the category of mental representation that might be unconsciously activated [27], Kollmuss and Agyeman do not consider them as an unconscious factor. Nevertheless, one of the most positive aspects of Kollmuss and Agyeman’s model is that it demonstrates the interaction between dispositional

and situational variables and between external and internal barriers, by identifying similar “limiting factors” found in Gardner and Stern’s [28,29] Model of Resource Consumption Behavior. However, as Courtenay-Hall and Rogers ([30], p.288) refer, Kollmuss and Agyeman’s definition of pro-environmental behavior—“behavior that consciously seeks to minimize the negative impact of one’s actions on the natural and built world ([9], p.240)—“excludes all non-conscious behavior from the range of what is to be recognized as ‘pro-environmental behavior’”.

Another theoretical model that aimed to integrate both conscious and unconscious factors and include barriers and constraints that result from the interaction between dispositional and situational variables, was the DN-Work model—“Did Not Work”—aimed at understanding why attempts to implement pro-ecological goal intentions (“I intend to achieve X”) into actions, do not work or fail to succeed [31]. Four main principles guide it: (1) barriers and constraints are not defined in terms of the “lack” of strength or absence of positive determinants (“lack factors”) but as negative determinants, independent of these; (2) their influence over ecological behavior depends on socio-cognitive processes involved in the interaction between individual/dispositional and contextual/situational features; (3) their influence can occur in different degrees of awareness and conscious mediation; and (4) barriers/constraints interact in ways that influence different pro and anti-ecological behavioral goals activation strength. With regard to the psychological processes involved, the model assumes a set of antecedents and consequents of barriers and constraints. The antecedents—limiting factors—refer to a set of preconditions for the latter to emerge and subsequently determine behavior. These pre-conditions result from an interaction between dispositional and situational factors, guided by a set of motivational and socio-cognitive processing principles. The consequents refer to the actual observable effects determined by the barriers and constraints, *i.e.*, the pro and/or anti-ecological behaviors resulting from the implementation/operation of pro and/or anti-ecological behavioral goals, respectively. Despite the aims of this model in integrating the different classes of variables, it is not clear on the processes that lead to the inhibition of pro-ecological action and how the different conscious and unconscious processes can interact, in order to achieve this.

In order to provide a better picture of existent literature in this regard, the variables in the referred models were classified in the table below (see Table 1). Their categorization was based on: (1) psychological level of explanation: non-psychological (structural or non-structural) *vs.* psychological (defined both in terms of absence of positive behavioral determinants or presence of negative behavioral determinants); (2) level of analysis: if barriers/constraints are found at the situational/contextual level (social and physical) and/or at the individual level (self); and (3) level of awareness: if the barriers/constraints are predominantly explicit and people are consciously aware of their use/implementation or if their manifestation is predominantly unconscious, thus having an implicit influence on people’s behaviors. Examples of variables within each category, from the models presented, are also given in Table 1.

Table 1. Classes of barriers and constraints on pro-ecological behavior, found in the literature.

Scope	Non-psychological	Lack of positive determinants		Negative determinants	
Level of analysis	Situational (Context)	Dispositional/Situational (Self/Context)		Dispositional/Situational (Self/Context)	
Level of awareness	Predominantly conscious	Predominantly conscious	Predominantly unconscious	Predominantly conscious	Predominantly unconscious
Authors	Objective barriers (Tanner [10]) External barriers (Gardner and Stern [6,24]) External factors (Kollmuss and Agyeman [9]) Structural and non-structural factors (Gaspar <i>et al.</i> [11])	Subjective constraints (Tanner [10]) Internal barriers (Gardner and Stern [6,24]) Internal factors (Kollmuss and Agyeman [9]) Perceived barriers/constraints (Gaspar <i>et al.</i> [11])	Unconscious barriers/constraints (Gaspar <i>et al.</i> [11])	Subjective constraints (Tanner [10]) Old behavior patterns (Kollmuss and Agyeman [9]) Perceived barriers/constraints (Gaspar <i>et al.</i> [11])	Ipsative constraints (Tanner [10]) Unconscious barriers/constraints (Gaspar <i>et al.</i> [11])
		Limited cognition; ideologies; comparison with others; sunk costs; discredence; perceived risks; limited behavior (Gifford [8])			
Examples	Inadequate transportation system; spatial inaccessibility of waste disposal facilities	Lack of knowledge; Low personal responsibility	Low implicit pro-ecological values; weak pro-ecological motivational orientations	Anti-ecological beliefs and attitudes	Implicit anti-ecological norms; “bad habits”

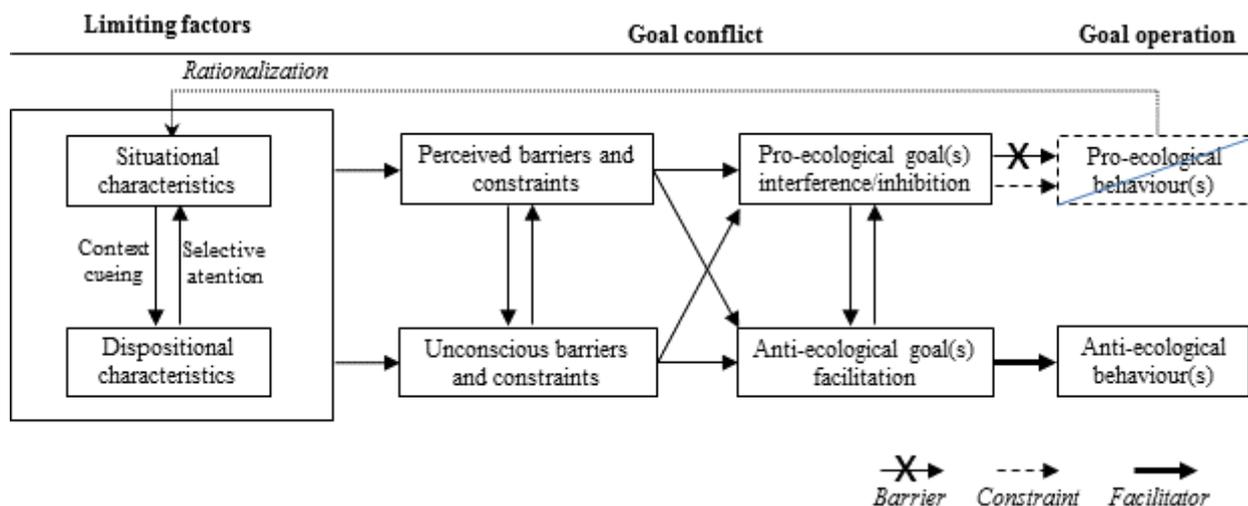
4. A Process View of Barriers and Constraints

Despite their high importance, the existent theoretical approaches to barriers and constraints on pro-ecological behaviors are mostly descriptive. Accordingly, they do not attempt to explain the processes by which the barriers/constraints influence ecological behaviors, based on the interaction between situational and dispositional factors. One of the models that attempts this [9] does not include the role of unconscious processes and the others that do [10,11], are not clear on how the individual and situational variables identified in theirs and other models [6,8,10,24] interact, thus becoming also descriptive in this regard.

Taking this into consideration, we present next a proposal of a process view of psychosocial barriers and constraints on pro-ecological behavior. This will be based on an adaptation of the DN-Work model [11] to integrate variables found in other models in the literature, and present a process approach of the processes that are expected to occur in their influence over pro-ecological behaviors. The approach will focus on two core processes in this regard: (1) the interaction between dispositional and situational variables that work as antecedents—distal variables—of the barriers and constraints emergence – proximal variables (as identified by Gardner and Stern [6,24]); and (2) the interaction between different classes of psychosocial barriers and constraints identified in the literature, namely the perceived and the unconscious barriers and constraints. A representation of this approach can be observed in the Figure 1 below, in which the limiting factors include not only the factors of a non-psychological nature identified in the literature (see Table 1) but also psychological factors associated with a set of dispositional and situational characteristics. Thus, this also includes the

barriers identified by Gifford [8]. The perceived barriers/constraints and the unconscious barriers/constraints categories include the corresponding categories found in the literature and identified in Table 1 as negative determinants. This approach does not consider, however, the “lack of positive determinants” category, as these do not fit the definition of barriers/constraints presented here. A more developed explanation will be given next.

Figure 1. DN-Work model of psychosocial barriers and constraints on pro-ecological behavior (adapted from [11]).



4.1. Limiting Factors as Antecedents of Barriers and Constraints

Gardner and Stern [6,24] identified “limiting factors” as internal and external psychological and non-psychological factors which prevent people from acting based on their pro-ecological attitudes. These can have either a more proximal or distal effect over behavior, depending on this effect being direct or mediated by other factors respectively. In order to allow for a better understanding of these differential effects, these will be viewed in accordance to Gaspar *et al.* [11]. Thus, differently from Gardner and Stern [6,24] who considered that the limiting factors could have either a distal or proximal effect; the “limiting factors” referred in this paper will be considered distal, while the barriers/constraints will be considered conceptually separated from these and defined as proximal. This is because the latter are psychological in nature while the former may or may not, be psychological.

Following from this, the limiting factors refer here to the antecedents of barriers and constraints, which result from an interaction between situational and dispositional characteristics, which may or may not lead to the emergence of barriers/constraints. Situational characteristics include the factors identified in Table 1 as non-psychological, namely physical factors related with urban planning, architectural and design features for example and other non-physical factors such as economical, socio-demographic and others. Therefore, this category includes factors identified by Gardner and Stern [6,24], Gaspar *et al.* [11], Kollmuss and Agyeman [9] and Tanner [10]). In addition, psychological factors corresponding to situational characteristics, can also be included, namely factors/variables related to the social context in which the individuals find themselves in (e.g., number of individuals behaving in a certain way; Kaiser and Keller [25]; Klöckner and Matties [26]). Dispositional characteristics can also be included in this category, thus representing general tendencies, motivations, values, world

views, attitudes and other types of individual traits/states (e.g., altruism) and mental representations of the self and the world around it (e.g., beliefs with regard to technology, economy, nature, *etc.*). These dispositional characteristics can include some of the barriers identified by Gifford [8], such as for example “limited cognition” or “ideologies”, which refer to variables that have a more distal effect over behavior, as they relate to a general cognitive functioning or worldviews, respectively. Differently from the (perceived and unconscious) barriers and constraints, which are behavioral and goal specific, these are general and unspecific characteristics (distal causes of behavior). Thus, they can also be considered antecedents of barriers and constraints that, in turn, have an influence over specific pro or anti-ecological goals and behaviors.

This interaction between dispositional and situational characteristics can be understood through a set of fundamental axioms of social psychology identified by Smith and Mackie [32]. These axioms imply that we are the “builders” of our own reality, *i.e.*, each of us constructs our own world(s). Also, this construction is socially shared, *i.e.*, we can influence and be influenced by others, to achieve agreement in how reality is perceived. This is guided by cognitive and motivational processes, which determine how we collect, analyze and interpret the information we receive, in order to mentally organize it and achieve meaning. On one side, motivational guiding principles imply that: (1) people strive for mastery—they aim to understand the world and predict what happens, in order to get rewards (e.g., through perceived behavioral control, to achieve physical and mental well-being); (2) people seek connectedness—they desire to be accepted and supported by other people (e.g., through social support); (3) people value “me” and “mine”—they wish to be seen and the people whom they like, in a positive way (e.g., through social comparison). On another side the cognitive guiding principles imply: (1) conservatism—our views are slow to change and tend to maintain themselves (e.g., has shown in the difficulty in changing habits); (2) accessibility—the information that is most mentally accessible/available, has the highest probability of influencing our thoughts, emotions and behavior (e.g., a recent nuclear accident in another country may strongly influence our decisions to buy a house in our own country, next to a similar facility); (3) superficiality *vs.* depth—although people can process the information they receive from the world around them in a systematic and effortful way (with depth), often they do this in a simple and superficial way (heuristic processing), with low effort.

Based on these principles, it can be seen that some of the barriers mentioned by Gifford [8] can be considered characteristics of how human beings process the information and thus, reflect Smith and Mackie’s [32] principles. The “Limited Cognition” category and specifically the “ancient brain” and “environmental numbness” for example, are associated with a more effortless and superficial processing of the information. The category “Limited Behavior” and specifically “tokenism” is associated with people’s conservatism and difficulty in changing their views and behaviors. On the other hand, the category “Comparison with Others” and specifically “social comparison” and “perceived inequity”; and the “conflicting values, goals and aspirations” from the “Sunk Costs” category, are all related with the motivational principles referred. Based on this view, some barriers identified by Gifford set the conditions for other barriers to emerge and influence behaviors. Thus, they should be separated from other types of barriers/constraints and included in the category of limiting factors, functioning as antecedents of these.

In addition to this, it seems logical that certain aspects of a situation might induce people to perceive them as limiting factors, while for other people that might not be the case. On the other hand,

certain dispositional characteristics (e.g., personal skills) might be a limiting factor in some contexts if absent, while in others might not be. This means that certain dispositions and situations might not be a limitation across contexts and people. Moreover, rather than having an effect separately, the limitations result from their interaction (see e.g., [9]). This interaction demands, on one hand, that the context (physical, social, economic, *etc.*) functions as a cue/prompt to the activation of a set of individual characteristics and mental representations. This *cueing* effect has been shown in the psychology literature to occur either with people being (conscious effect) or not being aware of this (unconscious effect). Examples include the activation of stereotypes, person impressions, attitudes, social norms, goals, personality traits and habitual behaviors (see e.g., [33]). On the other hand, this interaction implies that, despite many of these processes occurring outside people's awareness, people still need to give attention to them, namely *selective attention* to the relevant contextual and internal cues/stimuli [16]. In agreement, much research has shown that people's characteristics, such as current goals and motivations for example can determine this selective attention. One example was given by Linderberg and Steg ([18], p.119) with regard to the normative goal "to act appropriately": "when such a goal is activated (*i.e.*, when it is the "focal" goal, or, as it is called here, a "goal frame"), it will influence what people think of at the moment, what information they are sensitive to, what action alternatives they perceive, and how they will act".

One demonstration of this interaction between dispositional and situational variables was given by Kortenkamp and Moore [34]. In a study of ethical reasoning about environmental dilemmas they explored the influence of ecocentric, anthropocentric and non-environmental orientations over this, based on both individual and situational variables. With regard to dispositional features, they showed that a pro-environmental attitude was positively correlated with both anthropocentric and ecocentric reasoning (and not just with ecocentric, as initially hypothesized), but not with non-environmental reasoning. Concerning situational features, they showed that presenting an environmental dilemma in which the environmental impacts were made salient also induced anthropocentric and ecocentric reasoning but not non-environmental reasoning. Moreover, emphasizing a land-use conflict (environmental impact on a pristine land *vs.* a degraded land) in those dilemmas induced ecocentric reasoning while emphasizing a social conflict (grazing the land alone *vs.* with others) induced less ecocentric reasoning and more non-environmental reasoning. In the author's view, this implies that salient social issues (namely social conflict) moves people's focus away from land issues thus implying a less ecocentric reasoning and vice-versa. In view of that, the authors concluded that "both individual differences and situational factors influence the type of moral reasoning an individual may bring to bear on a tragedy of the commons" ([34], p.269).

Implied in the example from Kortenkamp and Moore [34] is that non-environmental reasoning can work as a constraint to the implementation of pro-ecological goals and as a facilitator of anti or non-environmental behavioral goals. In this sense, it fits in the categories of subjective constraints (Tanner [10]), internal barriers (Gardner and Stern [6,24]), internal factors (Kolmuss and Agyeman [9]) and of perceived barriers/constraints (Gaspar *et al.* [11]). This is because people may be consciously aware of this being a negative determinant (barrier) of their behavior, given the level of deliberation/reasoning involved. In this regard, the interaction between attitudes and situational features functions as an antecedent/limiting factor and determines the type of reasoning followed.

Nevertheless, it is not completely clear from this, which aspects of the interaction between the situation and the individual are conscious and which are unconscious. This was the focus of Biel and Thøghersen's [13] literature review on social norms activation in social dilemmas: situations involving a choice between an individualistic (competitive) action and a collective (cooperative) action with regard to the use of resources (environmental, financial, *etc.*). According to them, norm activation in social dilemma situations - e.g., the norm to compete, which would work as a barrier or constraint - can be determined both by individual and situational factors. With regard to the former, norms can be activated based on personal values, internalized by individuals. Thus, there can be individual variations in norm activation, with some individuals not behaving cooperatively because they do not feel consciously obliged to do it. Moreover, they might have an individualistic or competitive orientation—pro-self rather than pro-social—that might induce the activation of a norm to compete [13].

The processes involved and the choices made are not necessarily conscious. They can be associated with the unconscious activation of individual achievement and goals to achieve power or status, based on situational cues [35]. In addition, not only the context can prompt individual's goals but also the individual characteristics can inhibit norm activation. This implies preventing individuals from focusing on contextual cues or deviating their attention to other situation features. In accordance, Biel and Thøghersen write that "Cooperation norms are *not* activated if the individual fails to notice a need, or its relevance to his or her moral values, or effective action that he or she can master". Thus, with regard to norm activation, need salience for example, seems to be relevant [13], thus making clear the role of environmental cues in personal and social norms activation. In accordance, situational cues are important because when faced with a certain situation, individuals will search for these cues in order to assess and interpret the situation they are in. The behavior of others, for example, may influence the behavior an individual chooses to have. For example, seeing people contribute to a common resource increases the probability that an individual also contributes in that situation [13], while the lack of contribution might imply less individual contribution. In addition to the social features of the situation, norm activation can also be determined by structural and non-structural aspects or the non-psychological limiting factors. Accordingly, framing the situation as economic vs. non-economic implies a higher probability of activating an implicit norm of self-interest in the former, than in the latter [13]. Given the presence of unconscious components in norm activation, these variables fit in the categories of ipsative constraints (Tanner [10]) and unconscious barriers/constraints (Gaspar *et al.* [11]), as people may not be conscious of these processes taking place and influencing their behavior. These in turn are determined by limiting factors (psychological and non-psychological) resulting from both individual and situational variables.

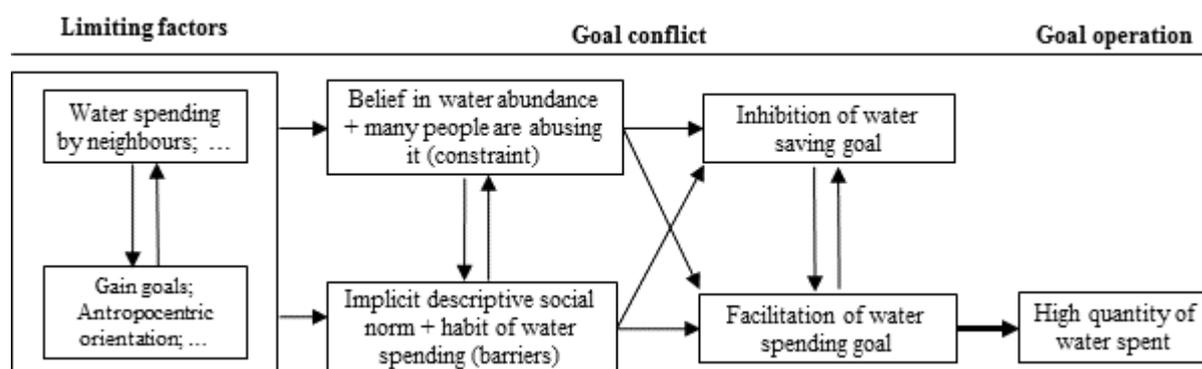
Although the examples given referred to antecedents of barriers/constraints, they can also function as post-justifications and rationalizations of behaviors. The former refers to when people are consciously aware that these factors are not the cause of their behavior but use them to justify it (e.g., attributing their increase in energy consumption to the weather when they are aware that this is not the cause of their behavior). The latter refers to rationalizations, which occur when people misattribute the causes of their behaviors, *i.e.*, attributing a cause that might not be the "real" cause of their behavior. An example would be identifying low spatial accessibility of recycling facilities, as a justification for not disposing the waste in there and placing it in the undifferentiated waste facilities, closer to home. In this situation, the barrier could be a high mental effort involved in the separation of

the different materials, which could function as behavioral constraint. These rationalizations might occur because people have limited introspective access to the causes and processes that guide their behaviors [16], thus attributing them to “visible” causes. Although people may be aware of their justifications not being accurate, the same is not the case for rationalizations, in which people may believe that the causes they attribute to having acted in a certain way are “real” causes. In this sense, the latter functions as a barrier/constraint that may only be overcome by increasing people’s competence in assessing their own actions and associated causes (higher competence in introspection). This is something worth being considered in future research, namely the role of factors and variables presented in this paper and by other authors, either as antecedents or as post-justifications/rationalizations of behaviors, or both. In addition, it should also be acknowledged that not all situational characteristics have an influence over behaviors, mediated by psychological processes. In fact, some argue that this can occur through a more direct path, as for example is the influence that the exterior temperature has on domestic energy consumption levels [36]. This is however a discussion open to epistemological and interdisciplinary debates, which go beyond the goals of this paper.

4.2. Psychosocial Barriers and Constraints: An Example

Drawing on the understanding of how the dispositional and situational characteristics interact and function as antecedents, it is important to present an example of this, based on the Figure 2 below.

Figure 2. Example of processes and factors that determine the psychosocial barriers and constraints.



This example draws on Corral-Verdugo and Frías-Armenta’s [37] study and corresponding results, with regard to domestic water usage behaviors. Based on this example, the situation refers to the neighborhood and associated social environment. This situation includes the water spending behaviors of others, that the individual observes (e.g., watching a neighbor watering the front lawn or washing the car)—and/or infers to occur (e.g., private domestic behaviors such as taking a shower). Moreover, given that in large-scale social dilemmas (e.g., pollution) “resources are less visible and environmental uncertainty is likely to play a larger role” ([13], p.106), the situational factors may also imply resource uncertainty [22]. Differently, the dispositional characteristics could include general motivations based on the activation of gain [18] and/or pro-self [13] goals and anti or non-environmental attitudes [38]. These are just a few examples, given that other situational and dispositional factors could also have an influence.

The interaction between these factors could, on one side, elicit a perceived behavioral constraint such as a belief that water is an abundant resource [37] and unrealistic optimism [21] in this regard. On the other side, it could elicit the unconscious activation both of a social norm to compete for the resource [13] and of a personal habit of water spending (see e.g., [24] for a related example). The explicit beliefs could work as a constraint by interfering with the pro-ecological goal to save water and facilitating the anti-ecological goal of spending as much water as one needs. Differently, both the implicit norm and the habit can be strong enough to work as barriers and thus, inhibit the pro-ecological goal, rather than just interfering with it. Apart from these, other perceived and unconscious barriers and constraints could be present, thus increasing the magnitude of the effect over goals activation and operation. Other examples include variables from the discredence, ideologies and sunk costs categories identified by Gifford [8], which can be seen as having their effect as barriers/constraints, rather than as their antecedents (as in the case of “limited cognition”).

Another important aspect to consider is that the perceived and the unconscious barriers/constraints can also interact and influence one another. An example of this refers to the cognitive inaccessibility of pro-ecological/cooperative behavioral options [22] identified by Tanner [10] as an ipsative constraint. This can not only function as an unconscious barrier but can also reinforce the general perception of behavioral barriers existence, *i.e.*, people can perceive that there are no alternatives to their behavior or that are constraints to this. Consequently, there can be a higher perceived difficulty in performing an alternative behavior. At the same time, the perceived barriers/constraints can also have an effect over the unconscious ones, as the reduced accessibility of pro-ecological behavioral alternatives, can increase the cognitive accessibility of the anti-ecological options that may also be perceived as easier to implement. This interaction is hypothesized to occur, given that, to our knowledge, there are no studies assessing it. This reflects a general gap in the literature, with regard to the study of barriers and constraints to pro-ecological behaviors. This is worrisome, as these factors and the processes involved may have many implications for behavior change and maintenance and consequently for projects and policies in this regard.

5. Final Remarks

Interventions aimed at the implementation and maintenance of pro-ecological behaviors need to decrease their chances of failure. For this, they should consider not only the “right” facilitators and conditions—positive determinants—but also the barriers and constraints to it—negative determinants.

This is particularly important because most of environmental education and behavior change projects and models regarding environmental behavior are still biased by a “positivity fallacy”, *i.e.*, the belief that as long as people have the right attitudes, intentions, skills, information, *etc.*, the right pro-ecological behavior should follow. However, the social sciences literature shows that there is an inconsistency between attitudes and behaviors in this regard and that the difficulty in changing behaviors is being underestimated [1]. One reason for this might be that the role of dispositional and situational characteristics in inducing an inhibitive/constraining effect over pro-ecological behaviors, is being underestimated. Consequently, the barriers and constraints are not being analyzed and dealt with. Moreover, with regard to research, many models misidentify psychological barriers and constraints, by considering only the non-psychological factors or the ones that result from positive determinants that

are “lacking”. Even those models that acknowledge the importance of psychosocial barriers and constraints and of negative determinants, only see a part of the big picture. This is because, on one side, they do not explain the processes involved. On another side, they often do not consider the effect of automatic processes occurring outside people’s awareness and consciousness.

The approach presented here aimed to be an initial attempt to fill these gaps, by presenting a process rather than a descriptive view of these. Nevertheless, although it was based on theory and research, studies on its specific predictions and processes involved are still needed. Differently, by presenting a descriptive view by identifying possible barriers and constraints, some theoretical approaches (e.g., [8]) seem also promising and should be further studied and developed. In addition, future research should differentiate between factors that function as barriers and constraints antecedents, and factors that are identified as this, but rather work as post-justifications or as rationalizations of these.

Apart from considering the interaction between the situation and dispositional characteristics, research and intervention projects should also consider the study and development of strategies focused both on pro and anti-ecological behavioral goals: by promoting the former and inhibiting/constraining the latter. These should on one side, aim to shield individuals from the influence of anti-ecological goals—“temptations” to not behave in a pro-ecological way and “bad habits”. On another side, they should be aimed at activating pro-ecological focal goals to which the individual is committed and has the intention to pursue—shielding of “temptations” and development of “good habits”—in order to inhibit the accessibility of alternative anti-ecological goals [20]. This could be achieved by cognitive and context changes [24] such as: (1) development of implementation intentions (“cognitive tuning”) and (2) situational facilitation of means to achieve pro-ecological goals (“context tuning”). This should allow people to develop the most effective skills to perform pro-ecological behaviors, while intervening in their context to allow establishing a set of (social and individual) requirements that need to be met, so that people can become environmentally competent [19]. In this way, rather than persuading people to change their ecological behavior “in the name of conscience”, we would be giving them tools to overcome personal and situational barriers and constraints.

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Conflict of Interest

The author declares no conflict of interest.

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