Motivations to Act for the Protection of Nature Biodiversity and the Environment: A Matter of "Significance"

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Article

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Abstract

Environmental activism, defined as a range of difficult pro-environmental behaviors, is analyzed within the conceptual framework of Significance Quest Theory (SQT). In Study 1, 40 interviews were carried out on two groups of people in the European Union: Committed Actors for Nature (CANs, $n = 25$) versus Committed Actors for Society (CASs, $n = 15$). Results demonstrated that Significance Quest (SQ) motivates each group to be strongly committed to their chosen action and the main difference between them being in their ideology (pro-social vs. pro-environmental). In Study 2 ($N = 131$), the relationship between SQ and intention to enact difficult pro-environmental behaviors was assessed. Results suggested that the higher the SQ, the higher the tendency to enact difficult pro-environmental behaviors, but not average or easy ones. Moreover, the higher the pro-environmental

ideology, the stronger the indirect effect of SQ on difficult behavior through willingness to sacrifice.

Introduction

Recently, the life-support systems of the biosphere have become overloaded due to the high consumption of natural resources and the consequent degradation of the environment and loss of biodiversity in natural habitats (Rockström et al., 2009; Shepherd et al., 2016; Whitmee et al., 2015). Despite recent increased awareness and knowledge of these issues, important behavioral changes have failed to follow (Schultz, 2011). The question is why an important behavioral change is still missing. The present paper explores possible psychological factors that play a role in people's regard for nature and

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willingness (or not) to actively engage in nature protection, focusing on "environmental activists" and committed pro-environmental actions.

Séguin, Pelletier, and Hunsley (1998) define "environmental activists" as "people who intentionally engage in the most difficult ecological behaviors" (Séguin et al., 1998, p. 631). Thus, environmental activists are people who engage in actions that require a certain level of commitment and energy to be performed and, consequently, that are not necessarily performed by the majority of the population. For example, a person who devotes his or her whole life to a cause, that is, protecting the environment and nature, who makes this cause his or her job or hobby, who encourages and promotes pro-environmental behaviors among others, is performing more difficult behaviors than a person who merely throws plastic house waste out in his or her recycling can. It is obviously the former person who could be defined as "strongly committed" because the former behaviors are those that require a high level of motivation to be enacted. The distinction between easy and difficult behaviors was previously made by Green-Demers, Pelletier, and Menard (1997) who identified self-educating pro-environmental behaviors as the most difficult and recycling behaviors as the easiest (Green-Demers et al., 1997).

Theoretical Framework for Studying Environmental Activism

Many studies have attempted to identify the determinants of "environmental activism" and committed pro-environmental actions. Embracing a developmental perspective, several studies focused on the experiences of childhood and adolescence that may have activated the desire to care for nature in adulthood (Chawla, 1998, 1999; Matsuba & Pratt, 2013; Palmer, Suggate, Bajd, & Tsaliki, 1998). The results of this work suggest that individuals' experiences are essential to creating a meaningful relationship with nature. Significant environmental experiences, in fact, contribute to an individual's perception of her or his relationship with nature, and in turn this has implications for relevant beliefs and actions (Vining & Merrick, 2012). Wells and Lekies (2006) found positive correlations between self-reported childhood participation in nature (e.g., hiking, camping) and later adult attitudes and behaviors toward the environment.

A perspective that focuses on the personal traits and characteristics of "environmental activists" has found that high levels of education (Scopelliti et al., 2018), personal efficacy, and environmental knowledge characterize "environmental activists." Moreover, Séguin et al. (1998) proposed that perceptions of health risks that are related to the condition of the environment are the proximal predictor of "environmental activism."

A theoretical framework often applied in studying pro-environmental behaviors is the Theory of Planned Behavior (TPB; Ajzen, 1988, 1991), which has shown good predictive validity for a number of easy pro-environmental behaviors such as recycling (Fornara, Carrus, Passafaro, & Bonnes, 2011; Mannetti, Pierro, & Livi, 2004) and saving water (Lynne, Casey, Hodges, & Rahmani, 1995), but also for some difficult behaviors such as "environmental activism" (see Fielding, McDonald, & Louis, 2008, for a review). According to TPB, individuals who hold positive attitudes toward "environmental activism" think that it is acceptable to engage in such behaviors and they also perceive that they can easily perform them. Therefore, they should have strong intentions to engage in environmental activism. On the basis of Stern's (2000) VBN model, McFarlane and Hunt (2006) tested a social-psychological model of environmental activism in the context of forest management, finding support for the predicted relationships between values, attitudes toward forest management, and activism. Gousse-Lessard, Vallerand, Carbonneau, and Lafrenière (2013) applied the dualistic model of passion to the understanding of environmental activism, suggesting that *passion* matters for environmental activists regarding the type of behaviors performed for the environmental cause (mainstream vs. radical). Specifically, the authors found that obsessive passion was associated with the intention to perform both mainstream and radical behaviors, whereas harmonious passion was associated with mainstream behaviors only. Another theoretical framework that has been used to understand pro-environmental behaviors is Self-Determination Theory (SDT; Deci & Ryan, 2002). This theory focuses on the motivations that guide the individual in decision making and behavior, and in particular the role of intrinsic motivation, considered in a developmental perspective, and based on the psychological needs of autonomy, competence, and relatedness. Past research has shown that self-determined motivation was associated with a higher occurrence of difficult pro-environmental behaviors (Green-Demers et al., 1997). In the realm of identity theories, Fraser, Clayton, Sickler, and Taylor (2009) demonstrated that working as a volunteer in a zoo enhances one's collective identity on the basis of shared values and a sense of purpose. Within the theoretical framework of pro-environmental competency, Kaiser, Roczen, and Bogner (2008) argued that behaviors aimed at environmental conservation can be better understood if they are viewed as motivated activities aimed at achieving a pro-environmental goal. Indeed, the propensity to enact demanding pro-environmental behaviors depends on the extent to which the person is motivated to invest effort into pursuing the goal of nature protection and conservation. The greater the motivation, the greater is the propensity to invest effort into the pro-environmental cause (Kaiser et al., 2008). On the basis of the abovementioned theories, it appears that an

external influence is necessary to trigger the pro-environmental behavior. This influence is the social context, in terms of values and norms (e.g., VBN, Stern, 2000). Moreover, because environmental activism requires high levels of energy investment, a strong personal motivation seems to be necessary in order for such behaviors to occur, for example, passion (Gousse-Lessard et al., 2013), and self-determination (Deci & Ryan, 2002). A theoretical model that includes both a motivational force and an external social influence is the Significance Quest Theory (SQT; Kruglanski et al., 2013; Kruglanski, Chen, Dechesne, Fishman, & Orehek, 2009).

Theoretical Approach to Studying Extreme Behaviors: SQT

The SQT is a theoretical framework developed to study violent extremism. SQT has, therefore, been applied mostly to the study of terrorism and radicalization. SQT assumes that the search for significance in life is the motivational force that prompts individuals to enact extreme behaviors. Possession of meaning in life is broadly defined as the subjective experience that one matters and is worthy of respect (Steger, Frazier, Oishi, & Kaler, 2006). In general, a sense that one's life is significant and worthy of respect is a fundamental component of human well-being (Allan, Duffy, & Douglass, 2014; Pratt & Ashforth, 2003; Steger, Dik, & Duffy, 2012), therefore living a worthwhile life is a basic human motivation. Kruglanski and coauthors define SQT as the desire to excel in what is culturally prescribed to gain the admiration of others (Kruglanski et al., 2013; Kruglanski et al., 2009; Kruglanski et al., 2014), that is, to be important for others and society, reflecting people's need to "make a difference," "to matter," "to be someone" in socially prescribed ways. The "others" to whom the SQT definition refers are people who are part of a reference group that matters to the person. According to SQT [Kruglanski et al., 2009; Kruglanski et al., 2014], the activation of significance quest (SQ) could be aroused in three general cases: (a) significance loss (i.e., group or personal humiliation, loss of meaning, failure in pursuit of an important goal), (b) threat of significance loss (i.e., worries about failing to comply the normative pressure to pursue a goal), and (c) significance gain (i.e., when an opportunity for a great significance gain may arise).

However, the SQ activation (i.e., activation of the goal of meaning gain) is not in itself sufficient to cause behavior. Indeed, the ideology of one's group plays a major role in determining what means should be chosen to pursue the goal of gaining meaning. In summary, based on SQT, engagement in terrorist behaviors takes place when the search for meaning occurs, which activates the goal of meaning restoration. But it is only when someone is part of or is identified with a group that subscribes to a specific and violent ideology that

the person will engage in violent behaviors. According to that aspect of the theory, if the group has a benevolent ideology, instead of a violent one, and the individual subscribes to it, he or she will act in extreme albeit pro-social ways. Therefore, SQ is theoretically equally conceived to predict both violent and benevolent behaviors (Kruglanski et al., 2013). Applying this theoretical framework to benevolent behaviors (i.e., pro-environmental actions), when the goal of acquiring significance is activated, the person could be disposed to engage in specific committed actions such as difficult pro-environmental behaviors. The action that one chooses as a means to restore significance is based on "a collective belief system to which an individual subscribes" (Kruglanski et al., 2014, p. 564); that is, the ideology to which one is exposed and that one embraces, that is, pro-environmental ideology in our target case.

The Current Research

In accordance with SQT, behaviors that do not require a strong commitment to be performed, namely, easy behaviors, and behaviors that could be performed by most people cannot be essential in restoring life's significance. Indeed, we cannot feel significant and uniquely important when enacting a behavior that is enacted by everyone else (e.g., recycling cans), but we would probably feel significant when we do something that is evaluated as important by others and that only we, or a small proportion of the population, are able to perform (e.g., organizing a movement to protect a threatened natural park). The first type of behavior, compared with the second type, requires lower investment of time, energy, commitment, and similar personal resources to be successfully carried out. In other words, the quest for significance is more likely to be fulfilled by a difficult behavior that requires strong personal dedication, personal sacrifices, and full commitment, and that relatively few people may be capable of.

In addition, when the goal of acquiring meaning is activated, it can direct the action (i.e., the avenues to achieve the meaning goal), in different directions; the direction is set by the ideology to which the individual subscribes (i.e., pro-environmental ideology in the case of pro-environmental behaviors).

The present two studies were designed to explore that hypothesis. Specifically, we investigated (a) whether the quest for significance can motivate people to act in an eco-friendly manner; (b) whether, in the service of SQ, individuals would be more willing to make sacrifices and to enact difficult behaviors than easy ones; and (c) whether there is a role for pro-environmental ideology in causing pro-environmental behavior under the question for significance motivation. Study 1 is a qualitative study that investigates the SQ as the

motivational force that can lead people to be extremely committed to either pro-social or pro-environmental actions. The principal question addressed in this study is whether comparing two groups of actors can highlight differences in terms of the search for significance activation, as well as whether the relevant ideology (pro-environmental vs. pro-social) differs between the two contrasted groups. In this study, activation of the quest for significance was explored qualitatively. Moreover, the ideologies that characterize the two groups of actors are also analyzed because SQT posits that when the quest for significance is activated, behavior will be ideologically driven. Study 2 is a correlational study that uses the SQT to examine quantitatively the process that leads people to be active on behalf of environmental protection. In testing the SQT in the realm of benevolent behaviors, in this work we focus on the mechanisms of the SQT concerning the loss of significance. These mechanisms have been accorded major attention in prior SQT research on violent extremism; therefore, it seemed reasonable to investigate whether they function in the same way in the domain of nonviolent pro-social action.

Study 1

Aims

The aim of Study 1 was to explore via qualitative evidence whether SQ (Kruglanski et al., 2009) can be a motivational force leading people to be extremely committed to pro-social or pro-environmental actions. In this study, search for significance activation sources were explored qualitatively by comparing two groups of committed actors (actors engaged in nature and biodiversity protection *vs*. actors engaged in actions for society). In line with SQT, we expect that negative experiences activate the search for significance (Kruglanski et al., 2013; Kruglanski et al., 2009), and this is what we looked for in interviews carried out with actors belonging to the two groups.

Beyond the sources of activation of the SQ, because SQT postulates that when the search for significance is activated, the ideology embraced will direct behavior, the ideologies that characterize the two groups of actors was also examined. In other words, the principal questions of this study are whether the two groups being compared (committed actors for nature and biodiversity vs. committed actors for society) both exhibit the quest for significance (Aim 1), and whether different ideologies (pro-environmental vs. pro-social) characterize the two groups (Aim 2). Finally, because SQT argues that the behavior enacted is a means to restoring significance, the presence of narratives related to the gain of meaning in life through pro-environmental actions was also looked at (Aim 3).

Method

Participants. Actions for biodiversity and nature conservation take place in many different sectors and occupations within our society, from farmers who decide to implement sustainable agriculture in their farm, to schools' teachers who stimulate a wonder for nature in children. To cover this diversity, committed actors (for nature and biodiversity vs. society) were identified on the basis of their activities in the following sectors: (a) business (including fishing, farming, forestry, food production, corporate land ownership and companies involved in tourism); (b) civil society (including school teachers, nongovernmental organizations [NGOs], foundations, media professionals, civil activists); (c) public society (including local governments, city parks, and projects part of Natura 2000 and UNESCO-Man And Biosphere networks). For each specific category, committed actors for biodiversity were identified on the basis of their public recognition as persons who spent time or energy on their activities, who received prizes and acknowledgment for their commitment, and obtained results in their action for biodiversity protection versus action for society. For example, in the NGO category, one person was the founder of an NGO that aims to protect a natural reserve and another person was the founder of an NGO that fights against the mafia, both being recognized by the public as important and highly committed to pursue their goals. Following this logic, two groups of people were created: Committed Actors for Nature (CANs, $n = 25$) and Committed Actors for Society (CASs, $n = 15$). Even though our focus was to understand pro-environmental behaviors, we decided to add a comparison group to assess whether the SQ motivational processes can apply to the broad pro-social realm as well. Participants were recruited in different European Countries that is, Belgium (5%), Finland (12.5%), Germany (7.5%), Italy (27.5%), Slovenia (10%), The Netherlands (17.5%), the United Kingdom (20%): within the BIOMOT 7FP project (De Groot, Bonaiuto, Dedeurwaerdere, & Knippenberg, 2015).

Instrument. The method utilized consisted of a semi-structured life story. The life history interview method was chosen because it permits the researcher to go through the life journey of the interviewees and to recreate "one's entire experience of life as a whole, highlighting the most important aspects" (Atkinson, 1998, p. 8); as well as to see the entire process and factors (contextual and individual) that led him or her to the present. Indeed, the life-history interview was structured in such a way as to encourage the interviewees to *ruminate* about their motivations to act for nature and biodiversity conservation and/or society. First, the interviewee was asked to describe his or her main work activity, the goal that he or she aims to

achieve in his or her own life (promotion and conservation of nature and biodiversity and/or action for society), and the goal to which he or she devotes his or her daily energies and commitment. Then, an exploration of the interviewee's life history followed, in which the roots and development of the interviewee's main interest are traced back to her or his childhood and the specific environments and social milieu of her or his own past time, until the present. Three main life stages were considered: 0 to 15 years old, 15 to 25 years old, and 25 years old and above.

Procedure. First, each participant was contacted via e-mail and/or phone to obtain his or her consent to participate in the research. Once consent was obtained, the interview was set up and conducted by one of two expert interviewers trained to guarantee coherence, and standardization of the interview protocol and process across partners' countries. The interviews were conducted during the years 2013-2014 in the interviewee's own language and were then translated into English. Each interview was appropriately coded. The coding process followed multiple steps. Following the open coding method of Strauss and Corbin (1990) combined with a phenomenological approach (Stewart & Mickunas, 1990), some initially useful concepts were coded on the basis of key phrases and experiences that could be related to the motivation to act for nature and biodiversity versus society. In this way, an initial list of codes was obtained. In the second step, codes were selected and theoretically organized within the framework of the SQT (Kruglanski et al., 2009). Resulting from these first and second steps, a coding book was created, and it was then used in the third step of the coding process, wherein the relationships between the codes were investigated. In this last step, the interviews were coded by two coders specifically trained (they were different persons from those who carried out the interviews). Their work showed an intercoder agreement of 97% on a sample of 20% of the interviews. In the course of exploring the principal question of this study, Strauss and Corbin's "Grounded Theory" (GT) approach (1990) was chosen as a starting point. The interviews consequently served as the basis for the subsequent coding and categorization of the contents, to examine the motives of the subjects as well as any similarities or differences in themes between the interviews. Interviews were examined with a text-analysis software (MAXQDA).

Coding, Analysis and Results

Coding focused on identifying the elements that drove the interviewees to act for nature and biodiversity versus society across three life-ages (0-15years;

15-25 years; 25 years until now), highlighting differences and similarities between the two groups (CANs vs. CASs).

Sources of the activation of the search for meaning in life. According to Kruglanski et al. (2009) and Kruglanski et al. (2014), personal losses, traumas, humiliation, and frustrating events are all sources of personal significance loss and will consequently activate the search for significance in one's life. To identify the search for significance activation in the two groups (Aim 1), we focused on coding negative experiences described as strongly negative emotional events, which were presented as a turning point in the life of the interviewee and as a key moment for directing her or his interests and actions.

In identifying the source of personal significance loss, three different levels of negative experiences were taken into account: (a) personal level, (b) social level, (c) environmental level. Kruglanski et al. (2009) and Kruglanski et al. (2014) conceptualized a personal loss as another possible loss of significance: Accordingly, the death or loss of a close relative is here considered a personal loss of significance. Moreover, Kruglanski et al. (2014) conceptualized a social-level significance loss as one that is related to the individual's group identity. Because the interviewees in this study did not belong to specific groups and are simply actors committed to specific behaviors, the social level of loss of significance is here operationalized as frustration induced by a social context (i.e., school or work). Finally, the environmental level of loss of significance is considered here as well. This type of negative event has not been taken into account in previous studies, which focused on terrorist behaviors. However, like any other traumatic event, an environmental event could be a source of significance loss. For example, someone who is strongly attached to a place, and who experiences its loss or destruction, could be traumatized by the experience (as, for example, in the increasing literature on "solastalgia" and other social-psychological effects related to the interplay among natural hazards, places transformations, and the inhabitants' levels of place attachment and identity; e.g., Bonaiuto, Alves, De Dominicis, & Petruccelli, 2016). Consequently, the event could lead to the search for significance.

In summary, the three kinds of negative events that we considered were: (a) death of a relative; (b) frustrations caused by one's social group at school or work; and (c) environmental events implying the direct loss of an important place (e.g., pollution of the area in which one lives or used to live) or the indirect loss of a natural place through watching TV or reading books and newspapers (e.g., pollution of a natural place in a different part of the world). These three kinds of negative events and the consequent search for significance are examined in terms of their recall by CANs and CASs in the three

Table 1. Sources of the Search for Meaning.

Period of life	Negative experiences	CANs		CASs	
		Frequency	%	Frequency	%
0-15 years	Death	1	4	3	20
	Frustration	4	16	3	20
	Environmental event	7	28	0	0
15-25 years	Death	1	4	1	7
	Frustration	11	44	7	47
	Environmental event	3	12	0	0
25 years until now	Death	1	4	0	0
	Frustration	2	8	2	13
	Environmental event	1	4	0	0
Total	Death	3	12	4	26
	Frustration	17	68	12	80
	Environmental event	11	44	0	0
	Experience as a turning point	16	88	8	66
	Total coded interviews	18	72	12	73
	Missing	7	28	3	27
	Total sample	25	100	15	100

Note. In the row "missing" are reported the number of interviews where narratives related to the codes were not found. CAN = Committed Actors for Nature; CAS = Committed Actors for Society.

major periods of life considered in the adopted procedure protocol. Regarding the first source of loss of significance, both CANs and CASs were likely to recall the death of a relative during the three periods of life: 4% of CANs and 20% of CASs experienced a death during the period 0 to 15 years; 4% of CANs and 7% of CASs experienced a death during the period 15 to 25 years; 4% of CANs and 0% of CASs experienced a death during the period 25 years until now (see Table 1), for example,

> In that time both my mother's parents died. [. . .] my grandmother, yes. Somehow I reacted very badly to it, because she died of cancer quickly and she was also very religious, that she was actually very good and it didn't help her. My grandmother was very social, she was completely burned, but she always liked to go working, potato picking and the like, and I used to follow her around the village. (Interview SLO_10; section 82-84; CAS; 0-15 years)

We found that both CANs and CASs were equally likely to recall the second type of negative events (social frustration) during the three periods of

their life. Indeed, for both sampled groups, the frustration occurred during adolescence (late first period of life, 0-15 years) and early adulthood (early second period of life, 15-25 years): 16% of CANs and 20% of CASs recalled a frustration during the period 0 to 15 years; 44% of CANs and 47% of CASs recalled a frustration during the period 15 to 25 years; 8% of CANs and 13% of CASs recalled a frustration during the period 25 years until now (see Table 1), for example,

> I guess it was my parents' divorce [. . .], it took place quite early in 1960s. At that time when you were getting a divorce, you had to live apart for two years. Then, there was the obligatory trial and so on. It did affect me but it also drew me outside, so I spent more time outdoors. Whenever I was sad or worried, I went to the rock xxx. I guess that was the most dramatic experience. (Interview FIN_15; section 55; CAN, 0-15 years).

The third source of search for significance (environmental events) is the only one that differed between the two groups of interviewees (CANs vs. CASs). CASs did not recall any environmental events, but 44% of CANs did recall such events. In particular, 28% of CANs recalled these events from the first period of life, 12% from the second period of life, and 4% from the third period of life. A clear example from CANs is the following:

> The articles on environmental disaster, the climate change, and everything else that I read made me start to constantly think about how humankind is not acting well or that we are causing massive problems on earth, and I felt guilty. (Interview FIN_17; section 50; CAN, 0-15 years).

Finally, the 88% of CANs who experienced a negative event (frustrations, deaths, and environmental events) described them as a turning point, a moment of awareness about the environment and nature issues (cf. Table 1), for example,

> I also had what I considered to be my spiritual awakening when I was there, where I came to the realization that there was something more to life than just the physical outer world; it wasn't just one dimension and that sort of, you know, reinforced the sense that you can do something to make the world a better place. It was the early seventies, it was the tail end of the sixties era, of the idealism, and we can change the world. I really felt I needed to do something because I wasn't satisfied with the world as it was presented to me, all this pain, suffering, and problems. (Interview UNI_25; section 26; CAN).

In the same way, 72% of CASs who experienced these kinds of negative events (frustrations and deaths) described them as a turning point and as a moment that initiated their interest in societal issues. These results showed that the search for meaning was activated in both groups, but that the source of activation differed between CANs and CASs: for both CANs (68%) and CASs (80%), general frustrations led to a search for significance. Only for CANs (44%), however, was this source rooted in an "environmental event."

Ideology

To identify whether the two groups we considered are characterized by different ideologies (Aim 2), we coded extracts for biospheric (preventing pollution; respecting the Earth; unity with nature; protecting the environment) and altruistic (equality; a world of peace; social justice; helpful) values (Stern, 2000; Stern & Dietz, 1994). In particular, biospheric values emphasize the environment, as well as biosphere protection and respect, as important principles in life. Moreover, to identify pro-environmental ideology, concepts expressed by the New Human Interdependence Paradigm (NHIP; Corral- et al., 2008) were taken into account. Those who embrace the NHIP's ideology consider nature to be as important as humankind; moreover, the balance between technological progress and respect for nature is viewed as necessary for human survival. We considered the abovementioned concepts to be related to pro-environmental ideology and coded some extracts as containing pro-environmental ideology on that basis too. One example of such an extract is the following: "there is not an absolute difference between humans and animals" (interview NED_27; section 100; CAN).

On the contrary, pro-social ideology is conceptualized as values reflecting concern for the welfare of others, that is, focusing on the importance of helping other people. We considered the abovementioned concepts to be related to pro-social ideology; as a result, extracts such as the following one were coded as containing pro-social ideology: "One can deal with each other peacefully and solving conflicts in a peaceful way, I find that are also very important aspects that aren't taken for granted" (interview GER_12; section 13; CAS).

In general, pro-environmental ideology was more prevalent among CANs (88%), whereas pro-social ideology was more prevalent among CASs (80%; see Table 2). This is in line with the actions that each group of interviewees are committed to: CANs are committed to action for environmental protection and they more frequently embrace a

Table 2. Ideology Embraced by CANs and CASs.

Ideology	CANs		CASs	
	Frequency	%	Frequency	%
Pro-environmental	22	88	6	40
Pro-social	7	28	12	80
Total interviews coded	24	96	14	93
Missing	1	4	1	7
Total sample	25	100	15	100

Note. In the row "missing" are reported the number of interviews where narratives related to the codes were not found. CAN = Committed Actors for Nature; CAS = Committed Actors for Society.

pro-environmental ideology; CASs are committed to action for society and more frequently embrace a pro-social ideology. Moreover, 28% of CANs also embraced a pro-social ideology, while 40% CASs also embraced the pro-environmental one. This means that there are shared values between the two groups of actors. The overlap in ideologies between the two groups of actors is not surprising. Indeed, altruistic values are also related to pro-environmental behaviors, because the altruistic value orientation is motivated by its consequences for other people, and altruistic people are aware that their pro-environmental behavior could also have positive consequences for others. Thus, acting in a pro-environmental manner could also serve as a means of acting altruistically. In particular, as Corral-Verdugo (2012) indicated, "altruistically and environmentally concerned people have the idea of protecting both the natural environment and their fellow humans" (p. 656) through pro-environmental actions. Moreover, the coded narratives show how exposure to ideology (pro-social vs. pro-environmental) happens through the social context. For example, exposure to pro-environmental values often occurred through a relative or other important person who shared the ideology with the interviewee during childhood of the interviewee, for example,

> Well it was respectful of nature [referring to the relationship that he had with nature]. It has always been. My grandfather taught me forestry and the kind of thing that, when you take care of the forest and treat it well, you will always get wood from it. It will always produce and you have to respect it and know which trees can be chopped down, and how to use it sensibly. (Interview FIN_10; section 104; CAN)

The process is also the same for the pro-social ideology:

> I saw the appreciation for that. My father cured people, they were ill, he cures them and he was also a very beloved family doctor who was liked by people and altruistic, too. He always acted with good intentions. I always got the example like that. (Interview NED_20; section 71; CAS)

Means to restore the significance loss. According to SQT theory (Kruglanski et al., 2009), the behaviors that one enacts in the service of an ideology serve as a means to satisfy the goal of having significance in life (Aim 3). Therefore, someone who experiences a loss of significance tries to restore it by being committed to actions that are considered important by others. In particular, acting on behalf of nature or people are the respective means that CANs and CASs use to restore their significance. Indeed, both CANs and CASs are committed to their actions because they think that it is essential to do something important, something useful for people and future generations, to live a worthwhile life. Both CANs and CASs define their activity and commitment as motivated by the need to do something useful, which makes their life meaningful, and lends them significance. This concept is expressed as a motivational force that prompts action and helps individuals maintain an active commitment to the cause. The interviewees usually described the main activity to which they are committed as meaningful, for example,

> in my life I've always chosen to look at how can I contribute to find solutions. From a critical point of view, but still how can we do something, how can we improve, how can we change society in the right way; and that has been a constant thing through all my engagements and work. (BEL_14; section 44; CAN)

Thus, interviewees defined their activities as meaningful and significant. Expressions attesting to that were more frequent at later stages of life, particularly during middle and late adulthood (see Table 3). Such descriptions are present in both CANs and CASs. Indeed, both types of actors (CANs vs. CASs) indicated that being engaged in actions to protect nature (for CANs) and being engaged in action for society (for CASs) make their life meaningful. This means that the actions they carry out are explicitly considered a means to restoring or gaining significance in their life. This result is in line with Erikson's (1950) theory of psychosocial development, which suggests that middle adulthood is a particularly important period for

Table 3. Means to Restore the Significance Loss.

Do something important	CANs		CASs	
	Frequency	%	Frequency	%
0-15 years	2	48	0	0
15-25 years	5	20	0	0
25 years until now	12	8	11	73
Total interviews coded	14	56	11	73
Missing	11	44	4	27
Total sample	25	100	15	100

Note. In the row "missing" are reported the number of interviews where narratives related to the codes where not found. CAN = Committed Actors for Nature; CAS = Committed Actors for Society.

developing meaning in life. Indeed, during middle adulthood people enter the developmental period of generativity versus stagnation, in which they try to find a way to contribute and give back to the world (Allan et al., 2014). Generative adults dedicate themselves to activities that will outlive the self and successfully find ways to contribute to the next generation (McAdams, de St Aubin, & Logan, 1993) and society.

Discussion

It is important to notice, that within this study, we focused specifically on detecting loss of significance events assuming that those would be easier to be recognized by the participants as a turning point in their life. During the coding process this assumption was indeed confirmed. Participants were clearly highlighting such significance loss occurrences. Opportunity for significance gain events and those related to a future threat to significance were not present in the life history narratives of our sample. On the whole, these results suggest that SQ is a motivational force that can lead individuals to be strongly committed to benevolent actions. Indeed, SQ was observed in the first two periods of life in both groups (CANs and CASs). Both groups showed similar levels of search for significance in life, which suggests that this particular motivation had the same role for all of the actors (Aim 1). However, an important difference was found regarding the type of loss the two groups experienced; the third level of loss was indeed only present in the CANs groups and not in the CASs. Even though the SQT has not tested this possibility yet, it is possible that the type of frustration (environmental) made CANs more prone to embrace an ideology (i.e., pro-environmental one) that allows restoring their lack of

meaning in that specific realm. Moreover, both groups chose to be strongly committed to an activity that is considered valuable and lends significance to their members' lives (Aim 3). This is in line with the argument advanced above, that a loss of significance leads people to be engaged in actions that require a strong commitment, because these actions are viewed as instrumental to restoring life's significance. Moreover, in line with Kruglanski et al. (2014), results suggested that it is not the loss of significance in itself that influences the type of behavior enacted (e.g., pro-environmental or pro-social); rather, it is the ideology that focuses the behavior in a particular direction. Indeed, in this study the degree of significance loss was similar across groups, but their ideology differed (Aim 2). In particular, ideology was qualitatively shown to push the attention toward a pro-environmental direction for CANs and a pro-social direction for CASs. That is, committed actors are engaged in pro-environmental or pro-social activities on the basis of the ideology that they embraced in one direction or the other, which directs their quest for personal significance.
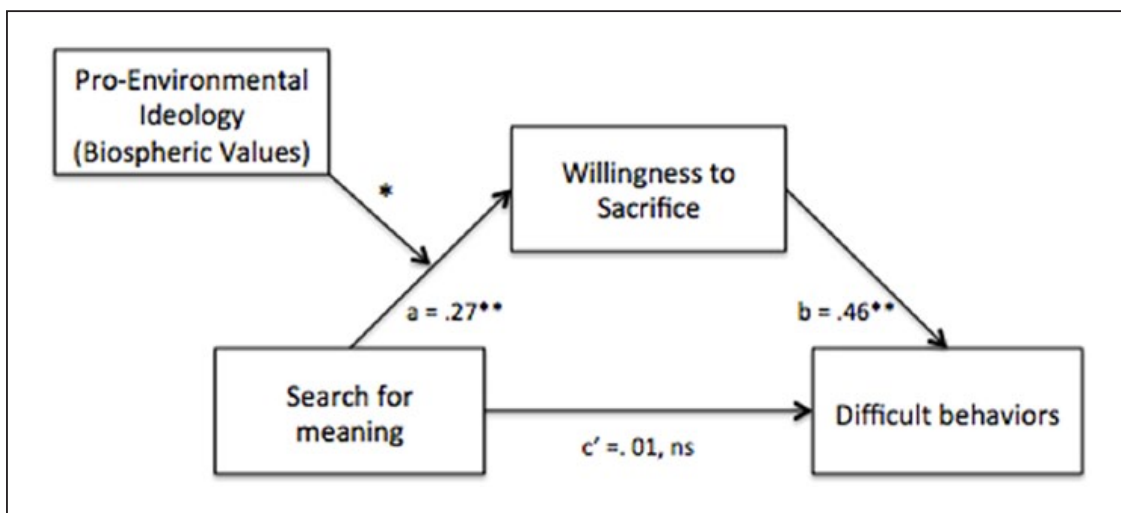
Study 2

The aim of Study 2 was to examine the process that leads people to be active on behalf of environmental protection, using a correlation methodology. Given the promising qualitative evidence found in Study 1, the following study examined the variables that SQT theory suggests will lead to extremism, to explain committed (i.e., difficult) pro-environmental behaviors.

Aim and Hypotheses

Study 2 assessed the relationship between search for meaning in life and committed pro-environmental behaviors, operationalized as difficult behaviors. Specifically, we proposed that the stronger the search for meaning, the more likely difficult pro-environmental behaviors should be undertaken (Hypothesis 1 [H1]). By the same token, the search for meaning is not expected to correlate with average or easy pro-environmental behaviors (Hypothesis 2 [H2]). The effect of the search for meaning on difficult behaviors should be mediated by the willingness to make sacrifices for protecting the environment. According to the SQ theory, indeed, self-sacrifice constitutes an important means to significance restoration (Dugas et al., 2016) that leads to enacting committed behaviors. However, as explained beforehand the sole activation of search for meaning does not direct the behavior in a specific domain but the ideology to which one subscribes provides the means (i.e., the behaviors) that will be most likely be admired by the group
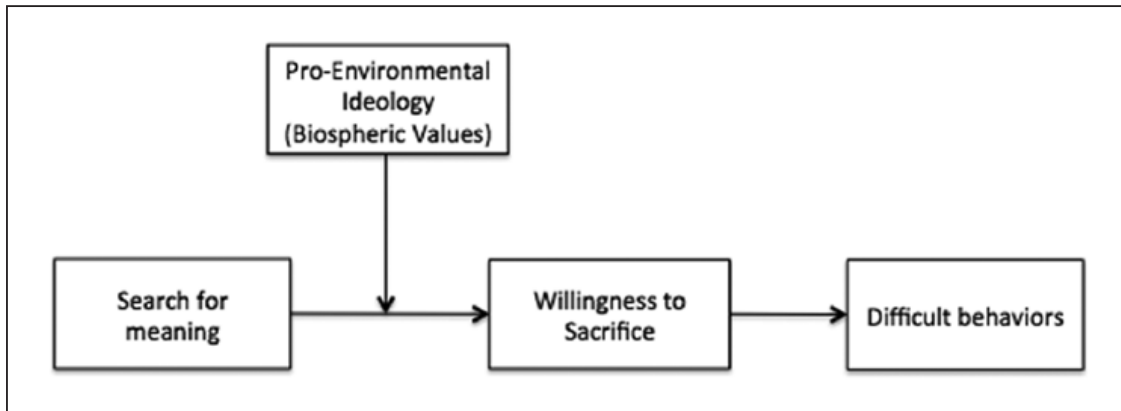
Figure 1. Graphical representation of the moderated mediation hypothesis (Hypothesis 3) (Study 2).

Figure 2. Graphical representation of the results of the moderated mediation (Study 2).
$*p < .05. **p < .001.$

and therefore that are instrumental to restore the lack of meaning. Accordingly, we hypothesized that the proposed path from search for meaning to difficult pro-environmental behaviors through willingness to sacrifice occurs when the relevant ideology (i.e., pro-environmental ideology) is adopted (i.e., high pro-environmental ideology) (Hypothesis [H3]; see Figure1 for graphical representation of H3).

Method

Participants. One-hundred thirty-one participants (76 men, 53 women, one missing; $Min_{age} = 20$, $Max_{age} = 65$, $M_{age} = 33.66$, $SD_{age} = 9.73$) were recruited

from the United States via Amazon Mechanical Turk website. Each participant was paid US$0.70.

Tool and procedure. Participants were asked to participate in a survey collecting information about daily behaviors. The survey included the following variables: *Meaning in life* (measured using five items from the search for meaning subscale by Steger et al., 2006) (α = .95) (1 = *absolutely untrue* to 7 = *absolutely true*); *Biospheric Values* were used to measure pro-environmental ideology (four items by De Groot & Steg, 2008) (α = .93) (1 = *not at all* to 7 = *totally*); *Willingness to sacrifice* (three adapted items from Stern, Dietz, Abel, Guagnano, & Kalof, 1999 e.g., "I would be willing to accept a change in my standard of living to protect the environment and nature") (α = .94) (1 = *strongly disagree* to 7 = *strongly agree*).

Pro-environmental behaviors. A 15-item scale, developed in a pilot study, was used to measure Pro-environmental behaviors. Even though a scale exists that differentiates three level of difficulty of pro-environmental behaviors (Green-Demers et al., 1997), within the current study the set of behaviors included was extended and diversified. More importantly within the difficult behaviors category, we included not only self-educating behaviors (Green-Demers et al., 1997) but also behaviors more specifically associated with environmental activism and committed actions (e.g., "doing voluntary work in environmental groups"; Séguin et al., 1998). We avoided behaviors with a political meaning as, for example, "taking part in protests," because these can be associated with particular political parties and political ideologies.

To test the new scale, 120 participants (49 men, 70 women, one missing; Min_{age} = 18, Max_{age} = 36, M_{age} = 27.31, SD_{age} = 5.73) were recruited from the United States via Amazon Mechanical Turk website. Each participant was paid US$0.30. Participants were asked to rate their willingness to enact the listed pro-environmental behaviors and then to rate the level of difficulty of each listed behavior, using a 7-point scale (1 = *not very difficult*, 7 = *very difficult*). An Exploratory Factorial Analysis was conducted using an Oblimin Oblique rotation technique on the scale measuring the willingness to enact pro-environmental behaviors. Results showed a clean three-factor solution, accounting for 69% of the variance observed in the data. The cross-loaded items with a factor loading values over .40 on two or three factors were eliminated (see details in Table 4). From the 20 initial items of the pro-environmental scale, the following three-factor solution was obtained: recycling and use of environmentally friendly products (four items); environmentally friendly purchases and energy saving (four items); educating oneself and voluntarism (seven items) (see Table 4). The perceived

Table 4. Exploratory Factor Analysis of the Pro-Environmental Behaviors (Study 2).

Items	Recycling and use environmentally friendly products	Environmentally friendly purchases and energy saving	Educating oneself and voluntarism
Recycling and use of environmentally friendly products ($M = 5.19$, $SD = 1.43$, $\alpha = .89$)			
Recycle glass jars and bottles.	.888		
Recycle steel and aluminum cans.	.825		
Recycle newspapers.	.769		
Use energy-efficient bulbs.	.528		
Environmentally friendly purchases and energy saving ($M = 4.93$, $SD = 1.12$, $\alpha = .70$)			
Do full load laundries.		.767	
Turn off the computer when I'm not using it.		.575	
Buy fruits and vegetables from the open bins.		.525	
Buy products without excessive packaging.		.521	
Educating oneself and voluntarism ($M = 4.12$; $SD = 1.51$, $\alpha = .93$)			
I attend public hearing or meeting about the environment and nature protection.			.945
Contribute money to an environmental or wildlife conservation group.			.892
Read books or magazines on the environment or nature.			.842
Do voluntary work in an environmental or wildlife conservation group.			.802
Be member of an environmental organization.			.778
Seek out information on environmentally conscious behaviors.			.732
Exchange environmental information with friends.			.679

Note. Cross loaded items with a factor loading values >.40 on two or three factors had been been eliminated: "Voted for or against a political candidate, in part, because of his or her position on the environment," "Point out an unecological behavior to someone," "Modify the diet to protect the nature and environment (e.g., choose seasonal vegetables)," "Buy biodegradable products," "Buy products that do not damage the environment (e.g., phosphate-free soap)."

difficulty of the environmental behaviors was examined next. Behaviors related to recycling and use of environmentally friendly products (M = 2.73, SD = 1.57, α = .92) displayed the lowest perceived levels of difficulty (henceforth, easy behaviors); the level of difficulty of behaviors related to environmentally friendly purchases and energy saving (M = 3.04, SD = 1.44, α = .87) was somewhat higher (henceforth, average behaviors); and behaviors related to educating oneself and voluntarism (M = 4.12, SD = 1.51, α = .90) scored the highest level of perceived difficulty (henceforth, difficult behaviors). A one-way repeated measure analysis of variance (ANOVA) indicated a significant difference between the means of the three levels of perceived difficulty, Wilks's lambda = .63, $F(2, 118)$ = 34.95, $p <$ .01. Follow-up comparisons (Bonferroni) indicated that each pairwise difference of the means was significant ($p < .01$). Therefore, on the whole, results confirmed the differences in the perceived difficulty of the three groups of behaviors.

In Study 2, the scale developed in the pilot study was then used to measure pro-environmental behaviors: (a) easy behaviors (M = 4.76, SD = 1.24, α =. 86); (b) average behaviors (M = 4.70, SD = 1.10, α = .75); (c) difficult behaviors (M = 4.05, SD = 1.35, α = .94). Participants gave their answers on a 6-point scale ranging from 1 (*not at all*) to 6 (*very much so*). Together, the three factors accounted for 48% of the variance observed in the data. All items loaded on their target factor ($L > .52$; Comrey & Lee, 1992) except items "Turn off the computer when I'm not using it" (factor loading = .311) and "Use energy-efficient bulbs" (factor loading = .380), and for this reason those two items were excluded.

Analyses

H1 and H2 were tested using bivariate correlation. H3 (Model 7 in PROCESS, Hayes, 2013) was tested using the bootstrapping method with bias-corrected confidence estimates (MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2004).

Results

In Table 5, bivariate correlations between variables are reported. As expected, search for meaning in life was positively and significantly correlated (r = .22, $p < .01$) with difficult pro-environmental behaviors (H1) and it was not significantly correlated with easy (r = .04, p = .69) nor average (r = −.02, p = .78) behaviors (H2). To test the moderated mediation hypothesis (H3), a moderated mediation analysis was conducted, using the intention to

Table 5. Means, Standard Deviations, and Bivariate Correlations (Study 2).

	M	SD	2	3	4	5	6	7	8
1. Searching for meaning in life	4.56	1.67	.42**	.20*	.02	.01	.30**	−.28**	.10
2. Willingness to sacrifice	4.02	1.85		.53**	.23*	.18*	.67**	−.40**	.20*
3. Biospheric values	5.36	1.27			.36**	.32**	.70**	−21*	.11
4. Easy behaviors	4.76	1.24				.46**	.44**	.10	.17
5. Average behaviors	4.70	1.10					.41**	−.06	.15
7. Difficult behaviors	4.05	1.35						−.28**	.21*
7. Age	33.66	9.73							.0
8. Gender	1.41	.49							

†Marginally significant. *$p < .05$. **$p < .01$.

perform difficult pro-environmental behaviors as a dependent variable. Search for meaning in life was included as a predictor, willingness to sacrifice for the environmental cause was treated as the mediator, and biospheric values were considered as a moderator of the search for meaning—willingness to sacrifice path (see Figure 1). Age and gender were also included as covariates. Results showed that search for meaning had a significant and positive effect on the willingness to sacrifice, $B = .27$, $SE = .09$, $t(123) = 2.88$, 95% confidence interval (CI) [.08, .46], $p < .01$; furthermore, the biospheric values had a positive and significant effect on the willingness to sacrifice, $B = .62$, $SE = .10$, $t(123) = 6.06$, 95% CI [.42, .83], $p < .001$ (see Figure 2). The interaction effect between search for meaning and biospheric values on willingness to sacrifice was found significant, $B = .09$, $SE = .04$, $t(123) = 2.17$, 95% CI [.01, .18], $p = .03$. The effect of willingness of sacrifice on difficult behaviors was found positive and significant, $B = .46$, $SE = .06$, $t(123) = 7.54$, 95% CI [.34, .58], $p = .03$. The indirect effect of search for meaning on difficult behaviors mediated by willingness to sacrifice, estimated with 5,000 bootstrapped samples, was significant for a high level of biospheric values ($B = . 19$, 95% CI [08, .33]), but not significant for a low level of biospheric values ($B = .06$, 95% CI [−.03, .15]). The index of moderated mediation was significant ($B = .45$, 95% CI [0.01, 0.09]). The direct effect of search of meaning in life after controlling for willingness to sacrifice was not significant ($B = .28$, $SE = .20$, $p = .176$). The entire model was significant, $F(4,124) = 19.93$, $p < .001$, $R^2 = .45$. Results confirmed H3. Specifically, the mediated effect of search for meaning on difficult pro-environmental behaviors through willingness to sacrifice was moderated by biospheric values. The higher the biospheric values, the stronger the mediated effect. No significant effects of the covariates were found on difficult behaviors.

Discussion

Results confirmed the hypotheses. First, search for meaning in life was positively and significantly correlated with difficult pro-environmental behaviors (H1), and it was not correlated with average and easy ones (H2). The moderated mediation hypothesis was confirmed (H3): The greater the search of meaning, the greater the tendency to sacrifice oneself for the environmental cause; this in turn finally brings about a greater likelihood to enact pro-environmental difficult behaviors, but only under the condition of high pro-environmental values.

General Discussion and Implications

The objective of the present studies was to understand *why* individuals engage in pro-environmental behaviors that require a large amount of energy and commitment within the SQ theoretical framework. Using different methodologies (life-history and survey), this research demonstrated that SQT may explain not only violent extremism (Kruglanski et al., 2009; Kruglanski et al., 2014) but also benevolent behaviors (e.g., pro-environmental behaviors), as long as the behavior requires a certain amount of commitment to be performed (i.e., a difficult action) and is in line with one's own ideology. More specifically, Study 1 qualitatively confirmed that SQ is a motivational force that can lead individuals to be strongly committed to benevolent actions relevant for nature biodiversity and protection and maintenance of the environment. Indeed, the SQ was found in the first two periods of life in both groups (CANs and CASs). In both groups, the search for meaning in life was nearly equal, demonstrating that it plays the same motivational role in the two groups of actors (active for nature and active for society). In line with Kruglanski et al. (2014), these results suggest that it is not the loss of significance per se that determines the type of behavior enacted; rather, it is the ideology that focuses action in a particular direction. Indeed, in this study, loss of significance was roughly equal across both groups, but the ideology they embraced (in terms of subscribed ideology pro-environmental vs. prosocial) was related to the specific actions they became committed to. Several studies (e.g., Chawla, 1998, 1999) that focused on significant experiences and environmental activism show how behaviors directed to protect nature are related to positive experiences with nature. However, within these studies the motivational process that leads from the experiences to pro-environmental behaviors is not clear. The current research provides an explanation of a motivational process that leads toward protecting the environment, focusing on the other side of the equation (i.e., negative experiences). However, a

better understanding of the motivational process trigged by positive events might provide a more complete explanation of *why* some people are strongly committed to protecting the environment.

Study 2 confirmed the relationship of SQ to pro-environmental behaviors. Specifically, consistent with the SQT theory, we found that the greater the search for meaning, the greater the tendency to perform difficult behaviors (but not average and easy behaviors, as was expected). Moreover, we found that the greater the search for meaning, the greater the tendency to sacrifice oneself for the environmental cause that finally brings about a greater tendency to enact pro-environmental difficult behaviors, but only under the condition of high pro-environmental values. In addition, the results provide support for applying SQ theoretical framework to explain any desirable committed action, such as pro-social and pro-environmental volunteerism.

In applied terms, this research has implications for the development of strategies that promote behaviors for the protection of nature biodiversity and the environment in general. The results obtained in Study 1 showed that the search for meaning is a broad motivational force that is more likely to be activated during late adolescence and early adulthood by negative events (in terms of their immediate effects on the person's subjective meaning in life). Special programs addressed toward people who have experienced traumatic events (e.g., harassment, loss of a close relative, etc.) could be developed to expose them to a benevolent ideology and in turn facilitate significance gain through pro-social and/or pro-environmental actions. This process is probably most relevant for those people who are more likely to see the search for meaning activated, not only because they experienced a negative event, but also because they are in the generativity stage of their life: namely, according to Erikson (1950), the period of life in which the search for meaning will be more active. Moreover, the results showed that personal and social negative experiences are not the only possible sources of loss of significance; experiences at the environmental level (i.e., negative environmental events) can have the same effect. These two findings suggest that people who, for example, experienced a natural disaster or who live in a polluted place are likely to experience a loss of significance. Moreover, people are probably more open to embracing an ideology and then enacting the behaviors that the ideology promotes. Here a role of a pro-social and pro-environmental ideology could be envisaged, possibly as a competitor force against anti-social and anti-pro-environmental ideologies. Future research can focus on developing interventions that aim to promote desirable ideologies within the SQ framework. Future research could, for example, build upon Arieli, Grant, and Sagiv's (2014) work, in which they presented an intervention designed to enhance benevolence values; or

focus on educational programs and learning opportunities that aim to promote pro-environmental ideologies (cf. Monroe, 2003).

Limitations and Future Directions

There are some limitations that must be discussed. First, retrospective qualitative studies (i.e., Study 1) are limited by the accuracy of the memories recalled by the interviewee. The hypotheses and results of Study 2 should be replicated in further experimental studies to retest the hypotheses and reinforce the results that were obtained. Within SQT, moreover, significance loss is not the only important motivational state; the opportunity for significance gain can also be a critical motivational force. This means that actors could be driven not only by having experienced negative events that threatened their meaning in life but also by positive future opportunities that promise greater meaning in their life. Such a "gain" (vs. "loss") framework (Kruglanski et al., 2009; Kruglanski et al., 2013) may prove equally useful for motivating individuals toward pro-biodiversity, pro-nature, and more general positive and pro-environment behaviors. Finally, in Study 1 we analyzed three levels of frustrations for CANs; however, this analysis was not mirrored for CASs. The third level of analysis was not evident for the CASs. It is plausible to assume that for pro-social individuals, the third level of analysis would be related to frustration occurring at the societal level (e.g., group discrimination). Future research that aims to understand broad pro-social behaviors within the SQT framework can look at this level of analysis for pro-social behaviors as well.

Funding

References

Ajzen, I. (1988). *Attitudes, personality, and behavior*. Chicago, IL: Dorsey Press. doi:10.1016/S0065-2601(08)60411-6

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*, 179-211. doi:10.1016/0749-5978(91)90020-T

Allan, B. A., Duffy, R. D., & Douglass, R. (2014). Meaning in life and work: A developmental perspective. *The Journal of Positive Psychology*, *10*, 323-331. doi:10.1080/17439760.2014.950180

Arieli, S., Grant, A. M., & Sagiv, L. (2014). Convincing yourself to care about others: An intervention for enhancing benevolence values. *Journal of Personality*, *82*, 15-24. doi:10.1111/jopy.12029

Atkinson, R. (1998). *The life story interview*. Newbury Park, CA: Sage. doi:10.4135/9781412986205

Bonaiuto, M., Alves, S., De Dominicis, S., & Petruccelli, I. (2016). Place attachment and natural environmental risk: Research review and agenda. *Journal of Environmental Psychology*, *48*, 33-53. doi:10.1016/j.jenvp.2016.07.007

Chawla, L. (1998). Significant life experiences revisited: A review of research on sources of environmental sensitivity. *The Journal of Environmental Education*, *29*(3), 11-21. doi:10.1080/00958969809599114

Chawla, L. (1999). Life paths into effective environmental action. *The Journal of Environmental Education*, *31*(1), 15-26. doi: 10.1080/00958969909598628

Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis*. Hillsdale, NJ: Lawrence Erlbaum.

Corral-Verdugo, V. (2012). The positive psychology of sustainability. *Environment, Development and Sustainability*, *14*, 651-666. doi:10.1007/s10668-012-9346-8

Corral-Verdugo, V., Carrus, G., Bonnes, M., Moser, G., & Sinha, J. B. (2008). Environmental beliefs and endorsement of sustainable development principles in water conservation: Toward a new human interdependence paradigm scale. *Environment and Behavior*, *40*, 703-725. doi:10.1177/0013916507308786

Deci, E. L., & Ryan, R. M. (2002). *Handbook of self-determination research*. Rochester, NY: University Rochester Press. doi:10.12691/ajap-5-1-2

De Groot, J. I., & Steg, L. (2008). Value orientations to explain beliefs related to environmental significant behavior: How to measure egoistic, altruistic, and biospheric value orientations. *Environment and Behavior*, *40*, 330-354. doi:10.1177/0013916506297831

De Groot, W. T., Bonaiuto, M., Dedeurwaerdere, T., & Knippenberg, L. (2015). *A theory of committed action for nature*. Nijmegen, The Netherlands: The BIOMOT project, ISIS, Faculty of Science, Radboud University Nijmegen. Retrieved from http://www.biomot.eu/outcomes.php

Dugas, M., Bélanger, J. J., Moyano, M., Schumpe, B. M., Kruglanski, A. W., Gelfand, M. J., . . . Nociti, N. (2016). The quest for significance motivates self-sacrifice. *Motivation Science*, *2*, 15-32. doi:10.1037/mot0000030

Erikson, E. H. (1950). *Childhood and society*. New York, NY: W.W. Norton. doi:10.1126/science.113.2931.253

Fielding, K. S., McDonald, R., & Louis, W. R. (2008). Theory of planned behaviour, identity and intentions to engage in environmental activism. *Journal of Environmental Psychology*, *28*, 318-326. doi:10.1016/j.jenvp.2008.03.003

Fornara, F., Carrus, G., Passafaro, P., & Bonnes, M. (2011). Distinguishing the sources of normative influence on pro-environmental behaviours: The role of local norms in household waste recycling. *Group Processes and Intergroup Relations*, *14*, 623-635. doi:10.1177/1368430211408149

Fraser, J., Clayton, S., Sickler, J., & Taylor, A. (2009). Belonging at the zoo: Retired volunteers, conservation activism and collective identity. *Ageing and Society*, *29*, 351-368. doi:10.1017/S0144686X08007915

Gousse-Lessard, A. S., Vallerand, R. J., Carbonneau, N., & Lafrenière, M. A. K. (2013). The role of passion in mainstream and radical behaviors: A look at environmental activism. *Journal of Environmental Psychology*, *35*, 18-29. doi:10.1016/j.jenvp.2013.03.003

Green-Demers, I., Pelletier, L. G., & Menard, S. (1997). The impact of behavioural difficulty on the saliency of the association between self-determined motivation and environmental behaviours. *Canadian Journal of Behavioural Science*, *29*, 157-166. doi:10.1037/0008-400X.29.3.157

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: The Guilford Press. doi:10.1111/jedm.12050

Kaiser, F. G., Roczen, N., & Bogner, F. X. (2008). Competence formation in environmental education: Advancing ecology-specific rather than general abilities. *Umweltpsychologie*, *12*(2), 56-70. doi:10.5167/uzh-9249

Kruglanski, A. W., Bélanger, J. J., Gelfand, M., Gunaratna, R., Hettiarachchi, M., Reinares, F., . . . Sharvit, K. (2013). Terrorism—A (self) love story: Redirecting the significance quest can end violence. *American Psychologist*, *68*, 559-575. doi:10.1111/josi.12022

Kruglanski, A. W., Chen, X., Dechesne, M., Fishman, S., & Orehek, E. (2009). Fully committed: Suicide bombers' motivation and the quest for personal significance. *Political Psychology*, *30*, 331-557. doi:10.1111/j.1467-9221.2009.00698.x

Kruglanski, A. W., Gelfald, M., Belangér, J. J., Sheveland, A., Hetiarachchi, M., & Gunaratna, R. (2014). The psychology of radicalization and deradicalization: How significance quest impacts violent extremism. *Advances in Political Psychology*, *35*, 69-93. doi:10.1111/pops.12163

Lynne, G. D., Casey, C. F., Hodges, A., & Rahmani, M. (1995). Conservation technology adoption decisions and the theory of planned behavior. *Journal of Economic Psychology*, *16*, 581-598. doi:10.1016/0167-4870(95)00031-6

MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research*, *39*, 99-128. doi:10.1207/s15327906mbr3901_4

Mannetti, L., Pierro, A., & Livi, S. (2004). Recycling: Planned and self-expressive behaviour. *Journal of Environmental Psychology*, *24*, 227-236. doi:10.1016/j.jenvp.2004.01.002

Matsuba, M. K., & Pratt, M. W. (2013). The making of an environmental activist: A developmental psychological perspective. *New Directions for Child and Adolescent Development*, *142*, 59-74. doi:10.1002/cad.20049

McAdams, D. P., de St Aubin, E. D., & Logan, R. L. (1993). Generativity among young, midlife, and older adults. *Psychology and Aging*, *8*, 221-230. doi:10.1037//0882-7974.8.2.221

McFarlane, B. L., & Hunt, L. M. (2006). Environmental activism in the forest sector social psychological, social-cultural, and contextual effects. *Environment and Behavior*, *38*, 266-285. doi:10.1177/0013916505277999

Monroe, M. C. (2003). Two avenues for encouraging conservation behaviors. *Human Ecology Review*, *10*, 113-125.

Palmer, J. A., Suggate, J., Bajd, B., & Tsaliki, E. (1998). Significant influences on the development of adults' environmental awareness in the UK, Slovenia and Greece. *Environmental Education Research*, *4*, 429-444. doi:10.1080/1350462980040407

Pratt, M. G., & Ashforth, B. E. (2003). Fostering meaningfulness in working and at work. In K. S. Cameron, J. E. Dutton, & R. E. Quinn (Eds.), *Positive organizational scholarship: Foundations of a new discipline* (pp. 309-327). San Francisco, CA: Berrett-Koehler.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*, 717-731. doi:10.3758/BF03206553

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., . . . Foley, J. A. (2009). A safe operating space for humanity. *Nature*, *461*, 472-475. doi:10.1038/461472a

Schultz, P. W. (2011). Conservation means behavior. *Conservation Biology*, *25*, 1080-1083. doi:10.1111/j.1523-1739.2011.01766.x

Scopelliti, M., Molinario, E., Bonaiuto, F., Bonnes, M., Cicero, L., De Dominicis, S., . . . Bonaiuto, M. (2018). What makes you a "hero" for nature? Socio-psychological profiling of leaders committed to nature and biodiversity protection across seven EU countries. *Journal of Environmental Planning and Management*, *61*, 970-993. doi:10.1080/09640568.2017.1421526

Séguin, C., Pelletier, L. G., & Hunsley, J. (1998). Toward a model of environmental activism. *Environment and Behavior*, *30*, 628-652. doi:10.1177/001391659803000503

Shepherd, E., Milner-Gulland, E. J., Knight, A. T., Ling, M. A., Darrah, S., Soesbergen, A., & Burgess, N. D. (2016). Status and trends in global ecosystem

services and natural capital: Assessing progress toward Aichi Biodiversity Target 14. *Conservation Letters*, *9*, 429-437. doi:10.1111/conl.12320

Steger, M. F., Dik, B. J., & Duffy, R. D. (2012). Measuring meaningful work: The work and meaning inventory (WAMI). *Journal of Career Assessment*, *20*, 322-337. doi:10.1177/1069072711436160

Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The meaning in life questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology*, *53*, 80-93. doi:10.1037/0022-0167.53.1.80

Stern, P. C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, *56*, 407-424. doi:10.1111/0022-4537.00175

Stern, P. C., & Dietz, T. (1994). The value basis of environmental concern. *Journal of Social Issues*, *50*(3), 65-84. doi:10.1111/j.1540-4560.1994.tb02420.x

Stern, P. C., Dietz, T., Abel, T. D., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmentalism. *Human Ecology Review*, *6*, 81-97.

Stewart, D., & Mickunas, A. (1990). *Exploring phenomenology: A guide to the field and its related literature*. Athens: Ohio University Press.

Strauss, A., & Corbin, J. M. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Thousand Oaks, CA: Sage.

Vining, A., & Merrick, M. (2012). Environmental epiphanies: Theoretical foundations and practical applications. In S. D. Clayton (Ed.), *The Oxford handbook of environmental and conservation psychology* (pp. 485-508). New York, NY: Oxford University Press. doi:10.1093/oxfordhb/9780199733026.013.0026

Wells, N. M., & Lekies, K. S. (2006). Nature and the life course: Pathways from childhood nature experiences to adult environmentalism. *Children Youth and Environments*, *16*(1), 1-24.

Whitmee, S., Haines, A., Beyrer, C., Boltz, F., Capon, A. G., de Souza Dias, B. F., . . . Yach, D. (2015). Safeguarding human health in the Anthropocene epoch: Report of The Rockefeller Foundation–Lancet Commission on planetary health. *The Lancet*, *386*, 1973-2028. doi:10.1016/S0140-6736(15)60901-1

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