



# Determining the role of eudaimonic values in conservation behavior

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**Abstract:** Values are the fundamental reasons why people engage in conservation behaviors. Recent research has called for a more refined approach to studying values in a way that accounts for the concept of eudaimonia. However, the empirical properties for a eudaimonic value scale have not been tested given that previous investigations have remained at the theoretical level. Drawing from an on-site survey of visitors to Denali National Park and Preserve, Alaska, we used a latent profile analysis to better understand the expression of multiple values of nature. Specifically, we segmented respondents by their value orientations with a particular focus on evaluating eudaimonic and hedonic values, alongside the established dimensions of altruistic, biospheric, and egoistic values. We identified 4 distinct subgroups defined by value orientations and validated these subgroups based on measures of conservation behavior and sociodemographic characteristics (e.g., age). These results indicated campaign messaging should harness a combination of eudaimonic, biospheric, and altruistic values to propel individual behavior. We also observed that hedonic and egoistic values defined how people related to nature and played a role, albeit less pronounced, in motivating them to take action. Our study is one of the first efforts to operationalize eudaimonia in a conservation context; thus, we have opened a new avenue for protected-area managers to align their strategies with the underlying values of stakeholders.

**Keywords:** behavior change, conservation social science, protected areas, psychology, values

Determinación del Papel de los Valores Eudaimónicos en el Comportamiento de Conservación

**Resumen:** Los valores son las razones fundamentales por las cuales las personas participan en los comportamientos de conservación. Las investigaciones recientes piden una estrategia más refinada para estudiar los valores de una manera que consideren el concepto de eudaimonia. Sin embargo, las investigaciones han sido a nivel teórico, así que las propiedades empíricas para una escala de valores eudaimónicos no han sido probados a fondo. Usamos un análisis de perfil latente basado en una encuesta a visitantes realizada in situ en el Parque y Reserva Nacional Denali, Alaska para explorar cómo se expresaron los valores múltiples. Después separamos a los respondientes según la orientación de los valores con un foco particular sobre la medición de las nuevas dimensiones de los valores eudaimónicos y hedonistas junto con las dimensiones establecidas de los valores altruistas, bioesféricos y egoístas. Identificamos cuatro subgrupos distintos definidos por estas orientaciones de los valores y luego los validamos con base en las medidas del comportamiento de conservación y las características sociodemográficas (p. ej.: la edad). Estos resultados indicaron que los mensajes emitidos durante una campaña deberían sacar partido de una combinación de valores eudaimónicos, bioesféricos y altruistas para impulsar el comportamiento individual. También observamos que los valores hedonistas y egoístas definieron la forma en que las personas se relacionan con la naturaleza y que desempeñan un papel, aunque menos pronunciado, en motivarlos para actuar. Nuestro estudio es uno de los primeros esfuerzos por poner en práctica la eudaimonia en

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un contexto de conservación; así, hemos abierto una nueva vía para los administradores de las áreas protegidas para alinear sus estrategias con los valores subyacentes de los actores.

**Palabras Clave:** áreas protegidas, cambios en el comportamiento, ciencias sociales de la conservación, psicología, valores

**摘要:** 人们参与保护行动的根本原因在于其价值观。最近有研究呼吁用纳入了实现论概念的更精确的方法来研究价值观。然而, 这样的研究目前只停留在理论层面上, 还没有在实证层面上深入检验实现论的价值量表。我们根据对阿拉斯加达纳利国家公园和保护区游客的现场调查, 利用潜在剖面分析探索了多重价值的表达。我们还根据价值取向对受访者进行了细分, 着重于测量新的实现论和享乐型价值观维度, 以及已建立的利他主义、利己主义和生物圈价值维度。我们确定了由这些价值取向定义的四个不同的分组, 并基于测量的保护行为和社会人口特征 (如年龄) 对这些分组进行了验证。结果表明, 保护活动宣传中应利用实现论、生物圈和利他主义的综合价值观来推动个体行动。我们还观察到, 享乐主义和利己主义价值观定义了人与自然的关系, 并且在激励人们采取行动方面发挥了作用, 尽管作用不那么明显。本研究是最早在保护背景下实际检验实现论的工作之一; 因此, 我们也开辟了一条新的途径来推动保护区管理者的战略与利益相关者的潜在价值达成一致。【翻译: 胡怡思; 审校: 聂永刚】

**关键词:** 保护社会科学, 心理学, 价值, 行为改变, 保护区

## Introduction

Although the application of social science for achieving global conservation goals is far from mainstream (Bennett et al. 2017), there is general consensus that conservation is as much about people as it is about biodiversity (Mascia et al. 2003; Schultz 2011; Díaz et al. 2019). Over the past 20 years, the social science discipline of conservation psychology has gained traction in research and influence on environmental policies (Clayton & Meyers 2015; Selinske et al. 2018); however, there are still gaps in knowledge of how the psychosocial factors that influence human behavior should be conceptualized and measured (Kenter et al. 2019). There is also a disproportionate focus in previous research on the role of attitudes for predicting behavior (Nilsson et al. 2019; Wallen & Landon 2020), rather than more fundamental factors such as human values, defined as guiding principles in life that transcend situations (Schwartz 1994; Manfredó et al. 2017). As the motivational basis for human decision-making (Dietsch et al. 2016), values diversify knowledge of predictors of behavior (van Riper et al. 2019) and provide insight on psychologically stable factors that are unlikely to change over a lifetime; thus, they have the potential to support the long-term success of conservation initiatives (Ives & Fischer 2017).

In the quest to understand value-behavior relationships, previous researchers have defined *conservation behavior* (CB) as intent-oriented action that benefits the environment (Stern et al. 1999; Kollmus & Agyeman 2002). This longstanding body of work indicates there are different degrees of difficulty in taking action (Halpenny 2010), as well as varied degrees of efficacy in how behaviors promote biodiversity conservation (van Riper & Kyle 2014; Amel et al. 2017). Variation also exists in the dimensionality of reported and intended

behavior (Larson et al. 2015), which is further complicated by the limited research that accounts for the disconnect between intentions and actual behavior due to situational constraints (Ajzen et al. 2004; Gifford & Nilsson 2014). Consequently, sound measurement that acknowledges these complexities and a strong theoretical foundation that builds on previous research are urgently needed to improve predictions about behavior change and inform intervention strategies. Particularly in protected area contexts, where agencies are uniquely positioned to foster environmental stewardship (Lee & Jan 2015), conservation campaigns can be developed in response to the current behavioral patterns and tendencies of stakeholders (Ballantyne et al. 2011).

Scholars are building a more nuanced understanding of how values operate at individual, group, and community levels (Manfredó et al. 2017; van Riper et al. 2018) and interact with one another over time (Kendal & Raymond 2019; Kenter et al. 2019). This growing literature has called for a broader theoretical basis for values research across multiple fields of study (Chan et al. 2018; Raymond et al. 2019) and explicit integration of values into conservation policy and decision-making (Christie et al. 2019; Díaz et al. 2019). Heeding this call, we evaluated the empirical properties of 2 nascent values within conservation science—hedonic values (i.e., seeking pleasure and comfort) and eudaimonic values (i.e., seeking personal excellence and meaning in life)—alongside a well-established tripartite conceptualization of values, including altruistic, biospheric, and egoistic (Stern et al. 1999). We identified the value profiles of respondents to a survey we conducted of visitors to Denali National Park and Preserve in Alaska (U.S.A.) and then validated the profiles based on 3 types of intended CBs and sociodemographic variables. We sought to gain empirical insight into the synergies among multiple values in relation to CB (Cetas & Yasué 2017) and increase the likelihood that

information is processed (Lakoff 2006) and acted on in support of conservation initiatives (Ford et al. 2019).

### Values as the Foundation of Conservation Behavior

Understanding how values, defined as enduring core belief systems that transcend specific situations (Schwartz 1994; Stern et al. 1999; Sagiv et al. 2015), influence goals, decisions, concern for nature, and behavior is fundamentally important for the future of conservation science. Numerous frameworks for classifying and measuring values were developed during the latter half of the 20th century (e.g., Allport et al. 1960; Rokeach 1973). Over the past two decades researchers have focused on three value orientations—altruistic, biospheric and egoistic—adapted from the value-belief-norm theory of environmentalism (Stern & Dietz 1994). These values can be plotted on a motivational axis with self-transcendence values at one end (i.e., altruistic and biospheric), indicating that the well-being of humanity and the environment are equal to or take precedent over self-consideration. At the other end of the axis are self-enhancement values (i.e., egoistic and hedonic), whereby individuals evaluate situations with respect to their own costs and benefits rather than in response to a collective (Schwartz 1994). Altruistic and biospheric values positively correlate with CB (van Riper & Kyle 2014; Lee & Jan 2015), whereas self-enhancement vis-à-vis egoistic and hedonic values are less likely to lead to CB (De Groot & Steg 2007; Lorenzo-Romero et al. 2019).

A growing body of work explores the role of self-interest in explaining why people support environmental conservation. In addition to egoistic values, hedonia is considered a universal self-enhancing human value that can explain decision-making in the pursuit of happiness (Schwartz 1994; Deci & Ryan 2008; Huta & Waterman 2014). Hedonic values drive individuals to seek physical, emotional, and cognitive well-being through attaining pleasure, enjoyment, and comfort (Huta & Ryan 2010; Sagiv et al. 2015). As explained by goal-framing theory (Lindenberg & Steg 2007), human behavior results from multiple factors, including short-term needs, such as hunger and sadness, that are derived from an individual's physical and emotional state as well as longer term factors such as ambition (Steg et al. 2014). Guided by values, these short- and long-term factors govern the way people process and act on information (Nordfjærn & Rundmo 2018). However, when competing values are activated, choices are made according to how values are prioritized (Steg & Vlek 2009). In particular, hedonic values are drivers of behavior that make people feel better in the moment. Related to both self-enhancement and openness to change (van Riper et al. 2018), hedonic values exert negative influences on CBs (Schwartz 1994). We define hedonic values as guiding principles that compel individuals to prioritize subjective, short-

term, rather than long-term, well-being (Milfont & Gouveia 2006; Steg et al. 2014).

Eudaimonic values have only recently been introduced to conservation science discourse (Cleary et al. 2017; Mumaw et al. 2017). Van den Born et al. (2018), in particular, positioned them as the “missing pillar” in current knowledge of human-nature relationships. Research in the well-being sciences has examined the broader concept of eudaimonia in relation to Ryan & Deci's (2000) self-determination theory (Kashdan et al. 2008; Huta & Waterman 2014), which suggests that self-actualization occurs when basic psychological needs (e.g., autonomy) are met. Individuals with strong eudaimonic values pursue a meaningful life (Ryan & Deci 2000; Ryan et al. 2008; Gooden & Greyner 2019) and derive fulfillment from engaging in activities that promote personal growth and are societally beneficial (Huta & Waterman 2014). In line with Fowers (2005), we defined eudaimonic value as a core belief that motivates individuals to prioritize behaviors that further autonomy, self-actualization, and excellence.

Though research on eudaimonia is burgeoning, there are two important ways this area of inquiry can be improved. First, there is uncertainty in the conceptualization of eudaimonia as a value rather than human need that warrants attention (Kashdan et al. 2008). Most scholars highlight growth, meaning, authenticity, and autonomy in definitions (Ryff 1989; Deci & Ryan 2008), whereas only some emphasize the role of excellence (e.g., Huta & Waterman 2014) and relatedness that are guiding principles in life (e.g., Fowers 2005). Second, few studies conducted in a conservation context have evaluated eudaimonic values based on data. For example, Knippenberg et al. (2018) explored the philosophical underpinnings of “nature-inclusive eudaimonia,” arguing that eudaimonic rather than hedonic values are better suited to indicate the well-being of people and nature. Given that knowledge of eudaimonia is providing a basis for more effective integration of multiple values into conservation planning (Chan et al. 2016; Pascual et al. 2017), we operationalized eudaimonic values alongside 4 other values to provide an empirical basis for evaluating stakeholder groups and to build a theoretical understanding of factors that influence CB.

## Methods

### Study Area

Denali National Park and Preserve (Denali) is a 2,446,387-ha (6 million acre) protected area in the subarctic landscape of south-central Alaska (United States). This protected area is managed by the Department of the Interior and is a UNESCO Biosphere Reserve. It encompasses

most of the Alaskan Range, including Denali, which is the emblematic feature of the park and highest peak in North America (6,190 m [20,310 feet]). The protected area is a popular tourism destination given its symbolism of both Alaska and wilderness experiences; approximately 600,000 people visited in 2018 (National Park Service 2019).

### Data Collection and Sampling Design

On-site self-administered surveys were distributed during the high-use season in 2016 (June–August;  $n = 667$ , 90.6% response rate). Using systematic stratification on temporal and geographic bases, visitors over the age of 18 were approached by trained survey administrators and asked for their voluntary participation in the study. Potential respondents were approached at random in the mornings and afternoons of 28 weekdays and 14 weekend days at 5 entrance points for accessing the protected area. For groups the member with the most recent birthday was selected to complete the survey to minimize potential group leader bias (Battaglia et al. 2008). Contact logs were used to monitor response rates and calculate nonresponse bias on the basis of gender ( $\chi^2 = 0.759$ ) and group size ( $t = 1.967$ ,  $df = 710$ ). Bias in group size was detected, but the data were not modified to adjust for the difference between people who refused to participate (mean = 2.18 [SD 1.29]) and those who agreed (mean = 3.13 [3.42]). Decisions about data collection and the sampling design were informed by preliminary site visits in 2016 and made in consultation with park managers. This study protocol was approved by the Institutional Review Board at the University of Illinois at Urbana-Champaign (approval number: 16849).

### Measurement

We used 16 survey items to measure altruistic, biospheric, egoistic (Stern et al. 1999), hedonic (Steg et al. 2014), and eudaimonic values on a Likert scale ranging from 1 (opposed to my values) to 9 (of supreme importance) (De Groot & Steg 2007). We referenced the hedonic and eudaimonic motives for activities-revised scale (Huta & Ryan 2010) and Stern et al. (1999) to guide the development of our survey items. We also asked respondents to rate how often they intended to engage in CBs on returning home from Denali on a 5-point scale (from 1, never, to 5, very often) across the following dimensions, including conservation lifestyle (e.g., buying environmentally friendly products), social environmentalism (e.g., talking to friends about environmental issues), environmental citizenship (e.g., donating money to environmental organizations), and land stewardship (e.g., staying on trails) (Larson et al. 2015; Landon et al. 2018).

Confirmatory factor analysis was used to evaluate the construct validity of values and behaviors. Models were estimated in Mplus version 7.4, and missing data were accounted for by using the full-information-maximum-likelihood method (Muthén & Muthén 2010). Acceptable model fit was assessed using a suite of indices, including the root mean square error of approximation (RMSEA) values  $<0.07$ , comparative fit index (CFI) values  $>0.95$ , and standardized root mean square residual (SRMR) values  $<0.07$  (Kline 2016). Items with standardized factor loading scores below 0.40 were dropped from the analysis (Brown 2015). Convergent validity was assessed and considered acceptable if composite reliability values exceeded 0.70 (Raykov 1997) and the average variance extracted (AVE) by the latent factor exceeded 0.45 (Fornell & Larcker 1981). Discriminant validity was assessed by comparing the squared correlations between pairs of constructs to the AVE for each construct and determined acceptable if the squared correlation was not greater than the AVE for either construct in the pair.

We used latent profile analysis (LPA) to explore heterogeneity in respondents' values. This test identified subgroups (i.e., profiles) of respondents that shared a similar pattern of responses to the variables of interest (Nylund et al. 2007). We estimated four different models where a latent (i.e., unobserved) categorical variable representing 2–5 subgroups was regressed on the value scales (Table 1). Model diagnostics (AIC, BIC, entropy, and the bootstrapped likelihood ratio test) were then compared to determine the best fit to the data. The preferred model had the lowest AIC and BIC values (Kuha 2004), entropy  $\geq 0.80$  (Celeux & Soromenho 1996), and a BLRT value indicating the addition of another latent profile would not significantly improve model fit (McLachlan 1987). Following the model selection procedure, we used the BCH method to test for mean differences in types of CB and age across the identified profiles.

## Results

### Survey Sample

Respondents were predominantly White (88.6%), gender distribution was equal (48.4% women), and ages ranged from 18 to 85 years (mean = 44.03 [SD 17.31]). The age of the average Denali visitor was bimodally distributed, with a peak between 28–32 years and 62–67 years. The sample population was well educated; 75.4% reported undergraduate or graduate degrees. Household income of 67.1% of respondents was  $>\$US50,000$  annually, and household size was from 2 to 3 people (mean = 2.54 [SD 2.49]). Although respondents hailed from 26 countries across 5 continents, a majority (85.6%) were U.S. residents and did not identify as Hispanic or

**Table 1. Modeling results from a latent profile analysis of visitors to Denali National Park and Preserve.**

Variable	Profile 2	Profile 3	Profile 4 <sup>a</sup>	Profile 5
Log likelihood	-17243.86	-16906.98	-16613.40	-16479.36
Akaike information criterion	34579.71	33937.96	33382.80	33146.72
Bayesian information criterion (adjusted)	346785.73	34018.78	33484.48	33269.25
Bootstrapped likelihood-ratio $\chi^2$ Test ( $k-1$ ) <sup>b</sup>	0.016	0.050	0.033	0.268
Entropy	0.90	0.85	0.87	0.87
Profile 2 (%)	70.89	42.13	22.61	22.68
Profile 3 (%)	—	36.95	13.77	24.12
Profile 4 (%)	—	—	32.582	10.24
Profile 5 (%)	—	—	—	29.77

<sup>a</sup> Preferred model based on model selection criteria.

<sup>b</sup> The p value presented for likelihood ratio  $\chi^2$  test.

**Table 2. Individual values for the 4 latent profiles and pooled sample in a survey of visitors to Denali National Park and Preserve.**

Individual value*	Pooled sample mean (SD)	big hearted	Latent profiles		
			living the life of eudaimonia	undecided	enthusiasts
Altruistic values ( $\alpha = 0.88$ ; $\rho = 0.89$ , AVE = 0.72)	7.55 (1.51)	8.39	6.43	5.27	8.49
Biospheric values ( $\alpha = 0.88$ ; $\rho = 0.89$ , AVE = 0.73)	7.43 (1.42)	7.74	6.67	5.32	8.56
Egoistic values ( $\alpha = 0.68$ ; $\rho = 0.69$ , AVE = 0.43)	4.86 (1.41)	4.43	5.19	4.15	5.35
Hedonic values ( $\alpha = 0.82$ ; $\rho = 0.83$ , AVE = 0.62)	6.50 (1.50)	5.67	6.62	5.12	7.78
Eudaimonic values ( $\alpha = 0.86$ ; $\rho = 0.86$ , AVE = 0.67)	7.33 (1.29)	6.85	7.68	5.44	8.36

\*Measured on a Likert scale: -1, opposed to my values; 0, not important; 3, important; 6, very important; 7, of supreme importance. These responses were recoded for analysis such that 1 was opposed to my values; 9 was of supreme importance. All factor loadings were significant at  $p < 0.01$ ;  $\lambda$ , standardized factor loading;  $\alpha$ , Cronbach's alpha;  $\rho$ , composite reliability; AVE, average variance extracted.

Latino (95.7%). Few respondents were Asian (6.3%), American Indian or Alaska Native (1.4%), Black or African American (0.9%), or Native Hawaiian or other Pacific Islander (0.6%). Most visitors traveled with family (54.0%) and friends (26.5%) in groups of 3 (mean = 3.13 [SD 3.42]). The majority (79.9%) visited Denali for the first time and spent 3.24 nights in the area.

**Model Results**

Confirmatory factor analysis distinguished among five values (i.e., altruistic, biospheric, egoistic, hedonic, and eudaimonic) and showed the data were an acceptable fit for the hypothesized model ( $\chi^2 = 122.042$ ;  $df = 23$ ; RMSEA = 0.083; CFI = 0.967; SRMR = 0.045). Values for CR and AVE exceeded recommendations for convergent validity with the exception of egoistic values (AVE = 0.42). One item measuring eudaimonic values was dropped due to cross-loading with hedonic values, and the land stewardship behavior dimension was dropped due to low factor-loading scores (Supporting Information). Respondents placed the greatest importance on al-

truistic (mean = 7.55 [SD 1.69]), followed by biospheric (mean = 7.44 [1.58]) and eudaimonic values (mean = 7.34 [1.37]). Hedonic (mean = 6.50 [SD 1.70]) and egoistic (mean = 4.86 [1.80]) values were less important (Table 2). Overall, respondents reported the strongest intentions to engage in conservation lifestyle behaviors (mean = 4.24 [SD 0.08]); social environmentalism (mean = 3.31 [0.20]) and environmental citizenship (mean = 2.64 [0.19]) intentions were rated lower (Table 3).

**Latent Profile Analysis Results**

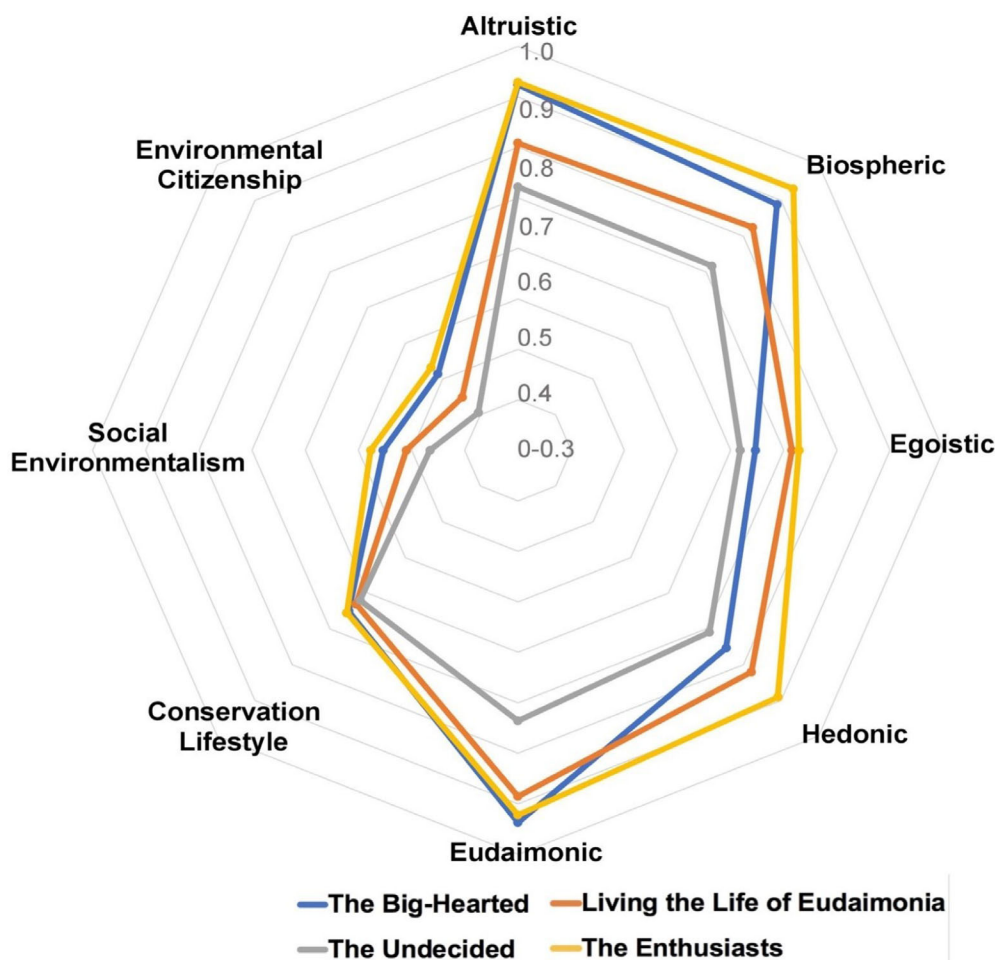
Results revealed that a four-class model was the best fit for the data. The 4-class model possessed an entropy value >0.80 and the BLRT for the 5-class model was not statistically significant, indicating that the addition of a fifth class did not yield an improvement in model fit (McLachlan 1987). Although the 4-class model did not have the lowest values for AIC and BIC, the change from the 4-class to the 5-class model was not substantial.

**Table 3.** Behavioral intentions for the pooled sample and comparisons across 4 latent profiles in a survey of visitors to Denali National Park and Preserve.

Intended behavior <sup>b</sup>	Pooled sample M (SD)	Latent profiles <sup>a</sup>				F	$\eta^2$
		bighearted	living the life of eudaimonia	undecided	enthusiasts		
Conservation lifestyle ( $\alpha = 0.81$ , $\rho = 0.81$ , AVE = 0.59)	4.39 (0.71)	4.47ac	4.27ab	4.17b	4.52c	6.92	0.03
Social environmentalism ( $\alpha = 0.87$ , $\rho = 0.89$ , AVE = 0.73)	2.74 (1.27)	2.84ac	2.57ab	2.32b	3.00c	8.40	0.04
Environmental citizenship ( $\alpha = 0.78$ , $\rho = 0.7$ , AVE = 0.49)	2.46 (1.25)	2.59a	2.23b	2.02b	2.70a	11.98	0.06

<sup>a</sup> Matching letters indicate responses were not significantly different across profiles.

<sup>b</sup> Measured on a 5-point scale from 1, never, to 5, very often. The land stewardship dimension was dropped due to low factor-loading scores. Differences between means read from left to right:  $\alpha$ , Cronbach's alpha;  $\rho$ , composite reliability; AVE, average variance extracted.



**Figure 1.** Two-dimensional relationship between respondents' value profiles and intentions to engage in conservation behaviors in a survey of visitors to Denali National Park and Preserve. The 4 profiles of survey respondents are represented by lines that move through 5 value dimensions along the right and 3 behavioral dimensions on the left. All scores are log transformed to be placed on the same scale, ranging from 0 at the center of the chart to 1.0 on the outer-most ring.

Findings from the LPA highlighted heterogeneity in values and behaviors across profiles (Fig. 1); each value profile was named to reflect the predominant value structures. In addition to values, variation in

behavioral intentions, age, and education was evaluated across profiles (Fig. 2). The auxiliary variable models revealed statistically significant differences between the groups across all 3 types of intended behavior,

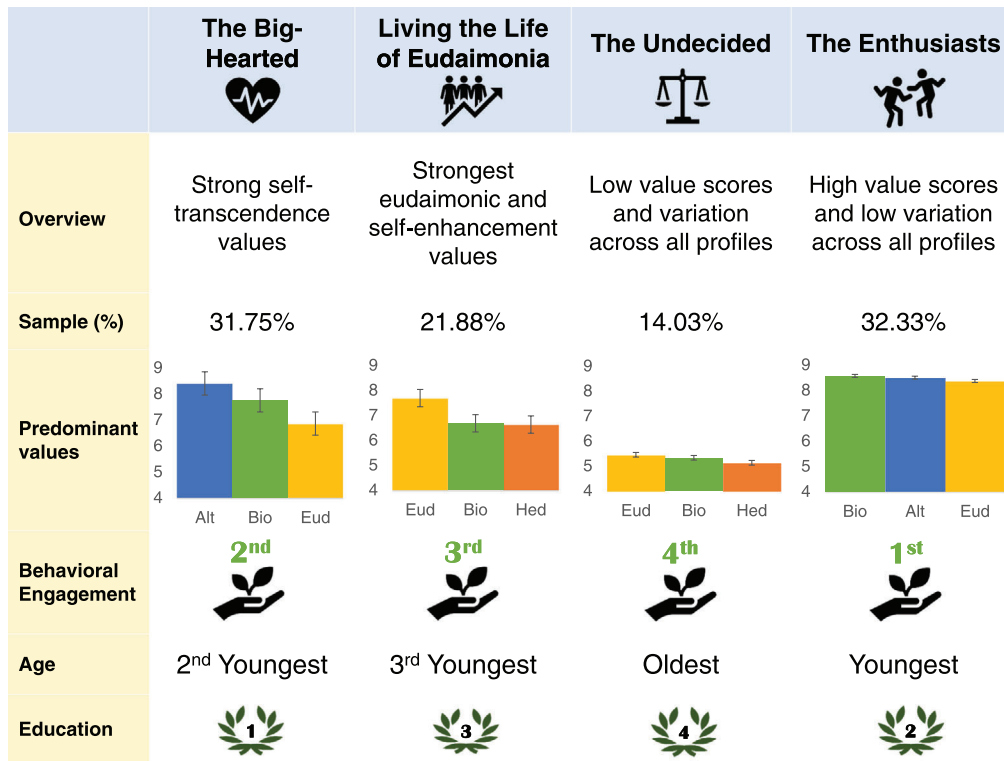


Figure 2. Summary of respondents’ predominant values, including altruistic (Alt), biospheric (Bio), eudaimonic (Eud), and hedonic (Hed). Sociodemographics, including age and education, as well as rankings for intended behavior (i.e., behavioral engagement) are displayed across all latent profiles.

including conservation lifestyle ( $\chi^2 = 41.68, p < 0.001$ ), social environmentalism ( $\chi^2 = 74.54, p < 0.001$ ), environmental citizenship ( $\chi^2 = 57.00, p < 0.001$ ), and age ( $\chi^2 = 14.58, p < 0.00q$ ) (df = 3, n = 617 for all).

### Discussion

Our findings provide a foundation for understanding how values can bolster the development of protected-area strategies for fostering behaviors that benefit the environment. Drawing on goal-framing theory (Steg et al. 2014), self-determination theory (Ryan & Deci 2000), and other value-related theories (Schwartz 1994; Stern et al. 1999), our results demonstrated support for distinguishing among five types of values, particularly hedonic and eudaimonic values. Individuals with a combination of strong altruistic, biospheric, and eudaimonic values reported higher behavioral intentions, and all respondents reported low intentions to engage in social environmentalism and environmental citizenship behaviors. These findings advance the field of conservation psychology by deepening scientific understanding of the value basis of stakeholder decisions regarding the environment. This research also carries potential to identify leverage points—ways that small changes in visitor experience can propel bigger changes

in environmental stewardship—by aligning communication strategies with values that are highly influential in guiding behavior. Public land management agencies will, in turn, be better equipped to facilitate transformations toward more environmentally friendly practices.

### Latent Value Profiles

Four distinct value profiles were identified using latent profile analysis (Table 4). Although the strength of different types of values varied, altruistic and biospheric values were relatively strong across all profiles, indicating that respondents were driven by their concerns for human and nonhuman species in a protected area. Our findings align with past research that suggests both hedonic and eudaimonic values are needed to pursue higher degrees of well-being and balance both short- and long-term needs (Huta & Ryan 2010). However, the placement of these more recently established values on Schwartz’s (1994) motivational axis is contested and should be further examined to clarify the theoretical basis for conservation action. We observed that hedonic and egoistic values performed similarly in that both received a low rating across all profiles. Conversely, eudaimonic values were rated highly alongside altruistic and biospheric values. The foundation of eudaimonia in self-determination theory (Ryan & Deci 2000) points

**Table 4.** Comparison of respondent sociodemographic characteristics by latent profiles in a survey of visitors to Denali National Park and Preserve.

	n (%)	Latent profiles (%)				F <sup>a</sup>	$\eta^2/N^b$
		<i>bighearted</i>	<i>living the life of eudaimonia</i>	<i>undecided</i>	<i>enthusiasts</i>		
Gender						12.23	0.10
Male	330 (50.60)	45.5	57.6	58.8	46.4		
Female	322 (49.40)	54.0	42.4	40.0	53.6		
Age (mean, mode)		(45.87, 29)	(45.26, 32)	(45.37, 32)	(41.21, 24)	2.93*	0.01
Household size							
Education						30.14*	0.13
less than high school	2 (0.30)	0.0	0.0	0.0	1.0		
high school graduate	88 (13.7)	10.0	19.6	15.2	12.6		
vocational or trade school certificate	24 (3.70)	3.5	4.3	5.1	2.9		
2-year college degree	44 (6.80)	4.0	5.1	11.4	8.7		
4-year college degree	222 (34.50)	29.5	35.5	36.7	37.9		
graduate degree	263 (40.90)	53.0	35.5	31.6	36.9		
Income						13.67	0.09
< \$49,999	113 (19.30)	15.2	22.0	27.8	19.0		
\$50,000–99,999	197 (33.70)	29.3	36.6	34.7	34.9		
\$100,000–199,999	201 (34.40)	38.0	32.5	25.0	34.9		
> \$200,000	74 (12.60)	17.4	8.9	12.5	11.1		

<sup>a</sup> Pearson chi squared; p value, asymptotic significance (Pearson's); \*, significance.

<sup>b</sup> Cramer's V and  $\eta^2$ , not approximate significance.

to alignment with Schwartz's (1994) self-enhancement orientation; however, our findings call into question whether eudaimonic values advance self-enhancement or self-transcendence. Clarification on how eudaimonic values relate to Schwartz's value theory will elucidate whether support for conservation initiatives is more effectively derived from messaging that emphasizes opportunities to live a meaningful life or motivational factors such as personal growth.

### The Value–Behavior Relationship

In line with previous research by Lee & Jan (2015), we found respondents with high altruistic and biospheric values reported the strongest intentions to engage in CB. More surprisingly, however, was the importance of eudaimonic values. Respondents who most highly rated all types of values (i.e., enthusiasts) and who held strong altruistic and biospheric values (i.e., bighearted) expressed the strongest intentions to engage in CBs, whereas individuals with the strongest eudaimonic values (i.e., living the life of eudaimonia) intended fewer CBs. It could be that eudaimonic values encompass motivations fulfilled by both materialistic (e.g., money, goods) and nonmaterialistic services (e.g., close relationships, living a meaningful life) that are fundamental to self-actualization yet broader than environmentalism. We also found that the enthusiasts and the big-hearted's intentions to engage in social environmentalism and environmental citizenship were lower than intentions to engage in conservation lifestyle behaviors. Although self-transcendence values (i.e., biospheric and altruistic)

are integral to environmentalism, alone they may be an insufficient catalyst for behavior change. This result also suggests that conservation messages should aim to activate the combination of values that are most strongly correlated to behavior, and, as such, our results indicate that interpretive information in Denali could highlight concerns about nature conservation (e.g., impacts of climate change on glaciers and vulnerable species, biospheric values), impacts on other people (e.g., threatened livelihoods of local indigenous communities, altruistic values), and opportunities for personal growth (e.g., development of skills and expertise, eudaimonic values).

We found that hedonic and egoistic values were weaker across all value profiles. Our research extended previous studies by empirically testing the hedonic values scale from Steg et al. (2014) and adapting a scale from the well-being sciences (Huta & Ryan 2010) to examine eudaimonic values. Our results suggest self-enhancement values that negatively correlate with CB were viewed least favorably as guiding principles in life. However, we did observe a low AVE score for our measure of egoistic values and recommend that future research soften the language of negatively worded items, as well as consider using the ideas of authenticity and autonomy to measure eudaimonic values (Huta & Waterman 2014). In a similar vein, respondents with strong biospheric values demonstrated low intentions to become more involved in social environmentalism and environmental citizenship. We contend there may be a "value hierarchy" in which certain values are more immediately influential than other types of values for influencing behavior in everyday life (Steg et al. 2014). It could be that fulfilling basic needs



related to well-being (i.e., eudaimonia) is a precondition for responding to subsequent values related to prioritizing short-term interests, which in turn, influences CB.

Both the difficulty of a behavior and the level of scrutiny experienced from one's peers, influence behavioral engagement. In line with Landon et al. (2018), we observed that respondents more readily engaged in private-sphere (i.e., conservation lifestyle) versus public-sphere behaviors (i.e., social environmentalism and environmental citizenship) across all value profiles. It could be that these activities required less effort (Larson et al. 2015). Echoing our findings, Venhoeven et al. (2013) observed low engagement in some forms of CB among individuals with strong self-transcendence values. These authors suggested that when people received immediate positive feedback on their behaviors, well-being increased. Building on this argument, we found that individuals with strong altruistic, biospheric, and eudaimonic values took action despite benefits being temporally distant and difficult to perceive (Gifford & Nilsson 2014). This is perhaps because respondents had high levels of motivation that eclipsed their immediate hedonic gains. Conservation organizations should consider the degree of effort required for engaging in CBs. Identifying ways to provide positive feedback to counteract psychological barriers can encourage a greater portion of visitors to engage in CBs. For example, conservation managers can develop games to make CBs fun and rewarding (Moghimehfar & Halpenny 2016). Such management approaches help confront the perceived difficulty of behavior change (Lawhon et al. 2018) while working toward situationally activating eudaimonic and hedonic values (Amel et al. 2017).

Respondent profiles were validated using intended behavior and sociodemographic characteristics. In line with past research, age was significantly different across profiles and positively influenced CB (Grønhoj & Thøgersen 2017; Stern et al. 1994). The enthusiasts and the big-hearted profiles held the highest intentions to engage in all three types of CB and were younger and more educated. Future research should consider how the value-behavior relationship performs in samples that are more representative of the general public given that visitors to protected areas tend to be less sociodemographically diverse than the U.S. public (Taylor et al. 2011). It could be that individuals with higher socioeconomic status are driven to different degrees by eudaimonic values given that they may have more capacity to plan for the future after basic needs are met. Further testing of both eudaimonic and hedonic scales across broader sociodemographic, cultural, and geographic contexts will support the generalizability of these concepts in conservation science and help close the so-called value-action gap.

## Implications for Conservation Science

Communication campaigns are increasingly popular mechanisms for behavior change. Rather than relying on intuition, campaigns grounded in psychological theories will provide a stronger foundation for supporting evidence-based decisions. Although attitudes (Nilsson et al. 2019) and norms (Kinzig et al. 2013; Metcalf et al. 2019) have received widespread attention, limited research has developed and tested values-based messaging (Lee & Jan 2015; Cetas & Yasué 2017), despite values being fundamentally important for providing guidance on how to promote CB in everyday life (Stern et al. 1999). Parks and protected areas are ideal settings to motivate CB through messaging because public lands facilitate intimate interactions between people and nature. In other words, experiences in protected areas have the potential to conjure powerful emotions that will be more likely to inspire behavior change on returning home if interpretive information is presented in a way that aligns with the value profiles of visitors. These positive experiences can be influential for motivating behavior change through increasing awareness of and personal responsibility for environments of which people have first-hand knowledge (Ballantyne et al. 2011). Building on previous research that has demonstrated that biospheric values (Van der Werff et al. 2013) most strongly influence intention to engage in CB, followed by altruistic and egoistic values (van Riper & Kyle 2014), we suggest hedonic and eudaimonic values comprise a broader basis of an individual's value profile that can be leveraged by managers and policymakers to advance conservation initiatives.

Our results indicate that multiple types of values influence patterns of CB in the context of public land management and can therefore be used to make information more persuasive. If the value profiles of stakeholders are known, resource managers can design intervention strategies that integrate concepts and language anchored in relevant core beliefs to increase the likelihood of success in changing behaviors that are affecting the environment. This philosophy aligns with the assumption that outreach and educational programming are not imposed on a tabula rasa citizenry (Kinzig et al. 2013); intervention strategies should be guided by insights from social science and then monitored over time. For example, conservation professionals could draw on previous social science research to design commercial-use agreements (e.g., guiding, recreation activities) between resource management agencies and concessionaires under which educational messaging for desired behaviors is explicitly outlined. To align these contracts with the values of stakeholders, our results suggest emphasis should be placed on engaging in activities that are immediately enjoyable, given the positive relationship observed between hedonic value and CB, and providing information

on how to increase engagement in CB over the long term (e.g., providing eudaimonic cues [van Riper et al. 2018b]).

Values are powerful forces that directly and indirectly influence behavior and shape the way people react to conservation initiatives over time (Kenter et al. 2019; Kendal & Raymond 2019). Given that people learn to appreciate landscapes through experience, conservation experts should develop strategies that support value persistence and seek to mobilize broad change for greater sustainability (Amel et al. 2017). In addition to modifying infrastructure within protected areas to promote CB, providing information and incentivizing recreational opportunities near one's home can generate stewardship and in turn foster growth of biospheric values. It is critically important that policies induce both short- and long-term changes in behavior that reach across protected area borders. Our findings can facilitate the development of such interventions that build on theory while providing guidance for policy makers on how to navigate the complexity of factors that foster and inhibit CB.

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## Supporting Information

### Supplementary Material

### Literature Cited

- Ajzen I, Brown TC, Carjaval F. 2004. Explaining the discrepancy between intentions and actions: the case of hypothetical bias in contingent valuation. *Personality and Social Psychology Bulletin* **30**:1108–1121.
- Allport GW, Vernon PE, Lindzey GE. 1960. Study of values: a scale for measuring the dominant interests in personality. Houghton Mifflin, Boston, MA.
- Amel E, Manning C, Scott B, Koger S. 2017. Beyond the roots of human inaction: fostering collective effort toward ecosystem conservation. *Science* **356**:275–279.
- Ballantyne R, Packer J, Sutherland LA. 2011. Visitors' memories of wildlife tourism: implications for the design of powerful interpretive experiences. *Tourism Management* **32**:770–779.
- Battaglia MP, Link MW, Frankel MR, Osborn L, Mokdad AH. 2008. An evaluation of respondent selection methods for household mail surveys. *Public Opinion Quarterly*, **72**:459–469.
- Bennett NJ, et al. 2017. Mainstreaming the social sciences in conservation. *Conservation Biology* **31**:56–66.
- Brown TA. 2015. The common factor model and exploratory factor analysis. In: *Confirmatory factor analysis for applied research* (pp.12–37). Guilford Press, New York, NY.
- Celex G, Soromenho G. 1996. An entropy criterion for assessing the number of clusters in a mixture model. *Journal of Classification* **13**:195–212.
- Cetas ER, Yasué M. 2017. A systematic review of motivational values and conservation success in and around protected areas. *Conservation Biology* **31**:203–212.
- Chan KM, et al. 2016. Opinion: why protect nature? Rethinking values and the environment. *Proceedings of the National Academy of Sciences* **113**:1462–1465.
- Chan KM, Gould RK, Pascual U. 2018. Editorial overview: relational values: what they, and what's the fuss about? *Current Opinion in Environmental Sustainability* **35**:A1–A7.
- Christie M, Martin-López B, Church A, Siwicka E, Szymonczyk P, Sauterel JM. 2019. Understanding the diversity of values of “Nature's contributions to people”: insights from the IPBES Assessment of Europe and Central Asia. *Sustainability Science* **14**:1267–1282.
- Clayton S, Myers G. 2015. *Conservation psychology: Understanding and promoting human care for nature*. John Wiley & Sons.
- Cleary A, Fielding KS, Bell SL, Murray Z, Roiko A. 2017. Exploring potential mechanisms involved in the relationship between eudaimonic wellbeing and nature connection. *Landscape and Urban Planning* **158**:119–128.
- Díaz S, et al. 2019. Pervasive human-driven decline of life on Earth points to the need for transformative change. *Science* **366**:eaax3100.
- Dietsch AM, Teel TL, Manfredo MJ. 2016. Social values and biodiversity conservation in a dynamic world. *Conservation Biology* **30**:1212–1221.
- De Groot JI, Steg L. 2007. Value orientations and environmental beliefs in five countries: validity of an instrument to measure egoistic, altruistic and biospheric value orientations. *Journal of Cross-Cultural Psychology* **38**:318–332.
- Deci EL, Ryan RM. 2008. Hedonia, eudaimonia, and well-being: an introduction. *Journal of Happiness Studies* **9**:1–11.
- Fornell C, Larcker DF. 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research* **18**:39–50.
- Fowers BJ. 2005. *Virtue and psychology: Pursuing excellence in ordinary practices*. American Psychological Association, Washington, DC.
- Ford RM, Rawluk A, Williams KJ. 2019. Managing values in disaster planning: current strategies, challenges and opportunities for incorporating values of the public. *Land Use Policy* **81**:131–142.
- Gifford R, Nilsson A. 2014. Personal and social factors that influence pro-environmental concern and behaviour: a review. *International Journal of Psychology* **49**:141–157.
- Gooden J, Grenyer R. 2019. The psychological appeal of owning private land for conservation. *Conservation Biology* **33**:339–350.
- Grønhoj A, Thøgersen J. 2017. Why young people do things for the environment: the role of parenting for adolescents' motivation to engage in pro-environmental behaviour. *Journal of Environmental Psychology* **54**:11–19.
- Halpenny EA. 2010. Pro-environmental behaviours and park visitors: the effect of place attachment. *Journal of Environmental Psychology* **30**:409–421.

- Huta V, Ryan RM. 2010. Pursuing pleasure or virtue: the differential and overlapping well-being benefits of hedonic and eudaimonic motives. *Journal of Happiness Studies* **11**:735–762.
- Huta V, Waterman AS. 2014. Eudaimonia and its distinction from hedonia: developing a classification and terminology for understanding conceptual and operational definitions. *Journal of Happiness Studies* **15**:1425–1456.
- Ives CD, Fischer J. 2017. The self-sabotage of conservation: a reply to Manfredo et al. *Conservation Biology* **31**(6), 1483–1485.
- Kashdan TB, Biswas-Diener R, King LA. 2008. Reconsidering happiness: the costs of distinguishing between hedonics and eudaimonia. *The Journal of Positive Psychology* **3**:219–233.
- Kendal D, Raymond CM. 2019. Understanding pathways to shifting people's values over time in the context of social-ecological systems. *Sustainability Science* **14**:1333–1342.
- Kenter JO, et al. 2019. Loving the mess: navigating diversity and conflict in social values for sustainability. *Sustainability Science* **14**:1439–1461.
- Kinzig AP, et al. 2013. Social norms and global environmental challenges: the complex interaction of behaviors, values, and policy. *BioScience* **63**:164–175.
- Kline RB. 2016. Principles and practice of structural equation modeling (fourth edition.) The Guilford Press, New York.
- Knippenberg L, de Groot WT, van den Born RJ, Knights P, Muraca B. 2018. Relational value, partnership, eudaimonia: a review. *Current Opinion in Environmental Sustainability* **35**:39–45.
- Kollmuss A, Agyeman J. 2002. Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research* **8**:239–260.
- Kuha J. 2004. AIC and BIC: comparisons of assumptions and performance. *Sociological Methods & Research* **33**:188–229.
- Lakoff G. 2006. *Thinking points: communicating our American values and vision*. New York: Macmillan.
- Landon AC, Woosnam KM, Boley BB. 2018. Modeling the psychological antecedents to tourists' pro-sustainable behaviors: an application of the value-belief-norm model. *Journal of Sustainable Tourism* **26**:957–972.
- Larson LR, Stedman RC, Cooper CB, Decker DJ. 2015. Understanding the multi-dimensional structure of pro-environmental behavior. *Journal of Environmental Psychology* **43**:112–124.
- Lawhon B, Taff BD, Schwartz FG, Miller ZD, Newman P. 2018. Exploring visitor attitudes, values, and behaviors regarding waste in national parks. Report Prepared for the National Park Service. LNT Center for Outdoor Ethics.
- Lee TH, Jan FH. 2015. The effects of recreation experience, environmental attitude, and biospheric value on the environmentally responsible behavior of nature-based tourists. *Environmental Management* **56**:193–208.
- Lorenzo-Romero C, Alcaron-del-Amo M, Crespo-Jareno J. 2019. Cross-cultural analysis of the ecological behavior of Chilean and Spanish ecotourists: a structural model. *Ecology and Society* **24**:38.
- Lindenberg S, Steg L. 2007. Normative, gain and hedonic goal frames guiding environmental behavior. *Journal of Social Issues* **63**:117–137.
- Manfredo MJ, et al. 2017. Why social values cannot be changed for the sake of conservation. *Conservation Biology* **31**:772–780.
- Mascia MB, Brosius JP, Dobson TA, Forbes BC, Horowitz L, McKean MA, Turner NJ. 2003. Conservation and the social sciences. *Conservation Biology* **17**(3):649–650.
- McLachlan GJ. 1987. On bootstrapping the likelihood ratio test statistic for the number of components in a normal mixture. *Applied Statistics* **36**:318–324.
- Metcalfe AL, Phelan CN, Pallai C, Norton M, Yuhas B, Finley JC, Muth A. 2019. Microtargeting for conservation. *Conservation Biology* **33**:1141–1150.
- Milfont TL, Gouveia VV. 2006. Time perspective and values: an exploratory study of their relations to environmental attitudes. *Journal of Environmental Psychology* **26**:72–82.
- Moghimehfar F, Halpenny EA. 2016. How do people negotiate through their constraints to engage in pro-environmental behavior? A study of front-country campers in Alberta, Canada. *Tourism Management* **57**:362–372.
- Muthén LK, Muthén BO. 2010. *Mplus: Statistical analysis with latent variables: user's guide*. Muthén and Muthén, Los Angeles, CA.
- Mumaw LM, Maller C, Bekessy S. 2017. Strengthening wellbeing in urban communities through wildlife gardening. *Cities and the Environment (CATE)* **10**:6.
- National Park Service. 2019. National Parks Service visitor use statistics. Retrieved October 3, 2019 from <https://irma.nps.gov/Stats>.
- Nilsson D, Fielding K, Dean A. 2019. Achieving conservation impact by shifting focus from human attitudes to behaviors. *Conservation Biology* **34**:93–102.
- Nordfjærn T, Rundmo T. 2018. Acceptance of disincentives to driving and pro-environmental transport intentions: the role of value structure, environmental beliefs and norm activation. *Transportation* **46**:2381–2396.
- Nylund KL, Asparouhov T, Muthén BO. 2007. Deciding on the number of classes in latent class analysis and growth mixture modeling: a Monte Carlo simulation study. *Structural Equation Modeling* **14**:535–569.
- Pascual U, et al. 2017. Valuing nature's contributions to people: the IPBES approach. *Current Opinion in Environmental Sustainability* **26**:7–16.
- Raymond CM, Kenter JO, van Riper CJ, Rawluk A, Kendal D. 2019. Editorial overview: theoretical traditions in social values for sustainability. *Sustainability Science* **14**:1173–1185.
- Raykov T. 1997. Estimation of composite reliability for congeneric measures. *Applied Psychological Measurement* **21**:173–184.
- Rokeach M. 1973. *The nature of human values*. Free Press, New York.
- Ryan RM, Deci EL. 2000. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist* **55**:68.
- Ryan RM, Huta V, Deci EL. 2008. Living well: a self-determination theory perspective on eudaimonia. *Journal of Happiness Studies* **9**:139–170.
- Ryff CD. 1989. Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology* **57**:1069.
- Sagiv L, Roccas S, Oppenheim-Weller S. 2015. *Values and well-being*. Hoboken, NJ: Wiley & Sons.
- Schultz PW. 2011. Conservation means behavior. *Conservation Biology* **25**:1080–1083.
- Schwartz SH. 1994. Are there universal aspects in the structure and contents of human values? *Journal of Social Issues* **50**:19–45.
- Selinske M, Garrard G, Bekessy S, Gordon A, Kusmanoff A, Fidler F. 2018. Revisiting the promise of conservation psychology. *Conservation Biology* **32**:1464–1468.
- Steg L, Perlaviciute G, Van der Werff E, Lurvink J. 2014. The significance of hedonic values for environmentally relevant attitudes, preferences, and action. *Environment and Behavior* **46**:163–192.
- Steg L, Vlek C. 2009. Encouraging pro-environmental behaviour: an integrative review and research agenda. *Journal of Environmental Psychology* **29**:309–317.
- Stern PC, Dietz T, Abel T, Guagnano GA, Kalof L. 1999. A value-belief-norm theory of support for social movements: the case of environmentalism. *Human Ecology Review* **6**:81–97.
- Stern PC, Dietz T. 1994. The value basis of environmental concern. *Journal of Social Issues* **50**:65–84.
- Taylor PA, Grandjean BD, Gramann JH. 2011. National park service comprehensive survey of the American public: Racial and

- ethnic diversity of national park system visitors and non-visitors (NPS/NRSS/SSD/NRR No. 2011/432. US National Park Service, Laramie, Wyoming.
- van den Born RJ, et al. 2018. The missing pillar: eudemonic values in the justification of nature conservation. *Journal of Environmental Planning and Management* **61**:841-856.
- Van der Werff E, Steg L, Keizer K. 2013. The value of environmental self-identity: the relationship between biospheric values, environmental self-identity and environmental preferences, intentions and behaviour. *Journal of Environmental Psychology* **34**: 55-63.
- van Riper CJ, Kyle GT. 2014. Understanding the internal processes of behavioral engagement in a national park: a latent variable path analysis of the value-belief-norm theory. *Journal of Environmental Psychology* **38**:288-297.
- van Riper CJ, Lum C, Kyle GT, Wallen KE, Absher J, Landon AC. 2018. Values, motivations, and intentions to engage in proenvironmental behavior. *Environment and Behavior* **52**:437-462.
- van Riper CJ, et al. 2019. Integrating multi-level values and pro-environmental behavior in a US protected area. *Sustainability Science* **14**:1395-1408.
- Venhoeven L, Bolterdijk J, Steg L. 2013. Explaining the paradox: how pro-environmental behaviour can both thwart and foster well-being. *Sustainability* **5**:1372-1386.
- Wallen KE, Landon AC. 2020. Systematic map of conservation psychology. *Conservation Biology* **34**:1339-1352.

