

-REPORT-
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Does Nature Possess Intrinsic Value? An Empirical Assessment of American's Beliefs

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Executive Summary: We analyzed data from two recent studies to determine the prevalence of the belief that wildlife possesses intrinsic value, and determine what factors contribute to this belief. Initial analyses of a 2009 mailed survey of adult Ohio residents found that (a) a large majority of residents (82%) believe that wildlife possess intrinsic value, (b) this belief is pervasive among both consumptive users of wildlife (e.g., hunters and trappers), as well as non-consumptive users, and (c) the belief is negatively associated with *age*, and positively associated with level of *education* and *income*. A subsequent (2014) study of adult U.S. residents found a similar majority (81%) believe in intrinsic value. Using a more conservative measure, the same study found that more than two-thirds of Americans (69%) unequivocally endorsed intrinsic value. Finally, we examined the prevalence of this belief among those who identify as “conservationists”. Results show that among those who strongly or very strongly identified as conservationists, unequivocal endorsement of intrinsic value pervasive (78% and 90%, respectively), while the belief was much less prevalent (59%) among those who did not self-identify as a conservationist.

Introduction

Acquiring the technical knowledge required for conservation is no more important than understanding what motivates people to conserve any particular aspect of nature. Without adequate motivation, technical knowledge is unlikely to be effectively applied to conservation. Many conservationists assert that the most robust and powerful motivation to conserve nature is that doing so is vital to human welfare (e.g., Passmore 1974, Costanza et al. 1997, Daily 1997, Shrader-Frechette 1998, Balmford et al. 2002; Kareiva and Marvier 2007; Maguire and Justus 2008, Tallis et al. 2008, Fisher et al. 2009, Justus et al. 2009). Others contend that nature's possession of intrinsic value offers greater motivation than is typically appreciated (e.g., Collar 2003, Ehrenfeld 2008, McCauley 2006, Child 2009). A third position is that the difference between those views is moot because both beliefs

would generally result in similarly robust motivation for conserving various elements of nature (e.g., Light & Katz 1996; Norton 2003). We are concerned that these conflicting views are rooted in conceptual misunderstandings about intrinsic value, as well as untested assumptions about who believes that nature possesses intrinsic value and how such beliefs influence people's actions toward nature. Because of these concerns, we sought to develop a measure that unambiguously assesses people's belief that nature possesses intrinsic value.

An individual's belief that nature possesses intrinsic value may depend upon what component of nature is being evaluated. For example, someone might believe that our ascription of intrinsic value depends upon the ability to feel pain. In this analysis, we attempted to account for such variability by focusing on beliefs about *wildlife*. Herein we describe two studies, a mailed survey of Ohio residents and a web-based study of U.S. residents, in which we attempted to measure the belief that wildlife possess intrinsic value. We describe the prevalence of *belief in intrinsic value* in both of these populations.

Study 1. Ohio Residents

Data were gathered through the use of a mailed survey conducted in 2009. Briefly, a random sample of ~9,400 households, stratified across eight regions, was drawn by a private sampling firm (Survey Sampling Inc., Shelton, CT), and modified version of Dillman's (2007) Tailored Design Method was used to structure contacts with the sample. Data collection methods are described in detail in Zajac et al. (2012).

Measurement. Respondents were asked a series of questions about the value of wildlife designed to contrast instrument value with intrinsic value. Two response items were used to determine the extent to which respondents believe that wildlife possesses intrinsic value: (1) Wildlife have inherent value, above and beyond their utility to people; and (2) Wildlife are only valuable if people get to utilize them in some way. These items were chosen because (a) existing measurement items that attempt to assess nature-related value orientations do not unambiguously address the question of intrinsic value (see Vucetich et al. 2015), and (b) existing items often focus on different components of nature (e.g., animals, fish, wildlife, forests, etc.). Additionally, we assessed a variety of social and demographic characteristics that are sometimes presumed to be associated with belief in intrinsic value. Specifically, we assessed respondents: (a) age, (b) gender, (c) income level, (d) education level, and (e) the type of community in which they currently reside (Table 1). We also asked respondents to identify wildlife-related recreational activities in which they participate (i.e., hunting, fishing, trapping, wildlife viewing).

Table 1. Operationalization of Study 1 Variables.

Type	Item	Level of Meas.	Response categories
<i>Belief in intrinsic value</i>			
	Wildlife are only valuable if people get to utilize them in some way.	Interval	
	Wildlife have inherent value, above and beyond their utility to people.	Interval	7; Strongly disagree (-3) to Strongly agree (3)
	Wildlife would have value even if there were no people around to enjoy them.	Interval	
<i>Social/demographic</i>			
	Age (What is your age?)	Interval	(open-ended)
	Gender (Are you...? M/F)	Nominal	Male / Female
	Income (What is your approximate annual household income from all sources before taxes?)	Ordinal	10 categories
	Education (How much formal education have you completed?)	Nominal	6 categories
	Community type (How would you describe the community in which you currently live?)	Nominal	5 categories
<i>Wildlife-related recreation</i>			
	In which of the following outdoor recreation activities do you regularly participate?	Nominal	4 categories (Hunting, Fishing, Trapping, Wildlife Viewing)

Respondents were asked to indicate to what extent they agreed or disagreed with each item based upon a 7-point scale that ranged from strongly disagree (-3) to strongly agree (+3). A composite measure was created by reverse-coding the second item and averaging across the two items. Initial item analyses indicated that both items designed to assess intrinsic value exhibited unacceptable levels of skewness and kurtosis (Noar 2003). Consequently, we dichotomized the combined measure of intrinsic value such that 1 indicated a belief in the intrinsic value of wildlife, and 0 indicated disbelief or ambivalence. We used the cross-tabulations function to estimate the percentage of respondents who believe wildlife possess intrinsic value for each group of interest (e.g., hunters, anglers). To examine the association between consumptive and non-consumptive activities and intrinsic value, we created mutually-exclusive categories by combining activities into the following four groups: (a) people who participated in no wildlife-related recreation, (b) people who participated in consumptive activities only (i.e., hunting or trapping), (c) people who participated in consumptive and non-consumptive activities (i.e., hunting or trapping *and* wildlife viewing), and (d) people who participated only in non-consumptive activities (i.e., wildlife viewing). Chi-square tests were then used to determine if belief in

intrinsic value varied across groups, and correlation coefficients were used to determine the relationship of group membership with belief in intrinsic value.

Results. A large majority of individuals in all of the groups examined reported believing that wildlife possess intrinsic value. Belief in IV was lowest among trappers (75%), followed by hunters (79%), anglers (82%), and was highest among those who engaged in wildlife viewing (87%). When sampling error is accounted for, estimates overlap for all consumptive recreation groups (Figure 1); however, the estimate for non-consumptive, wildlife viewers (84.3 – 89.1%) overlapped only with anglers (79.3% - 84.6%).

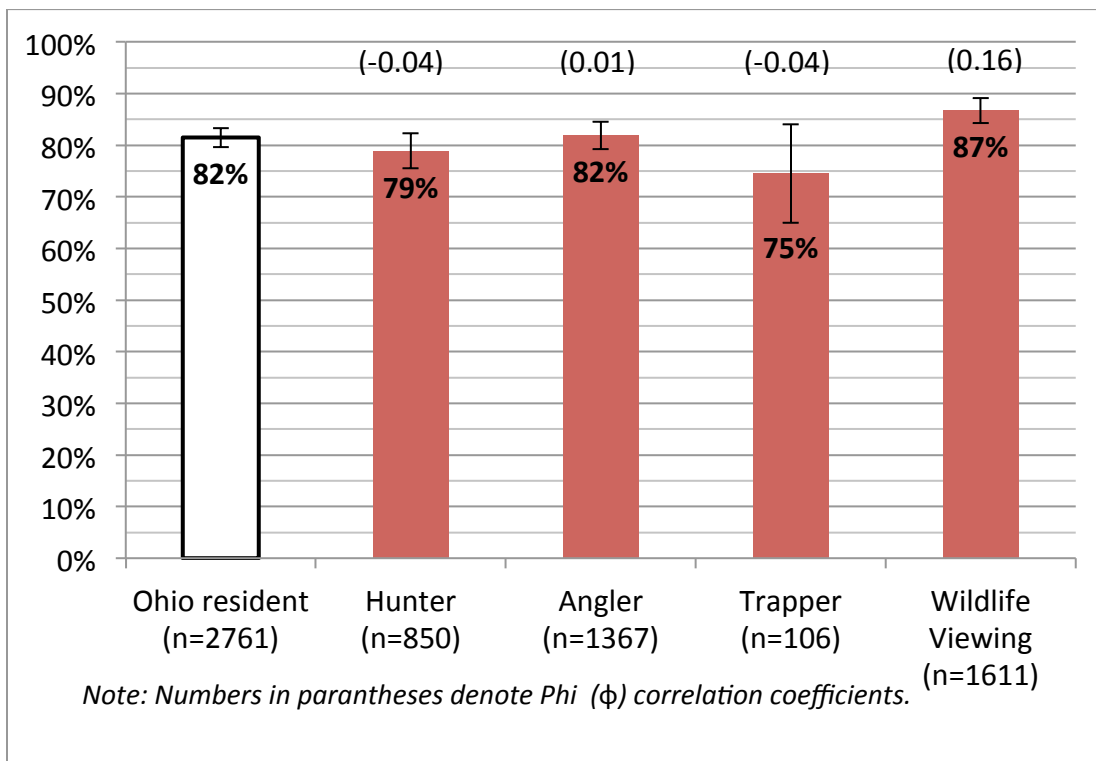
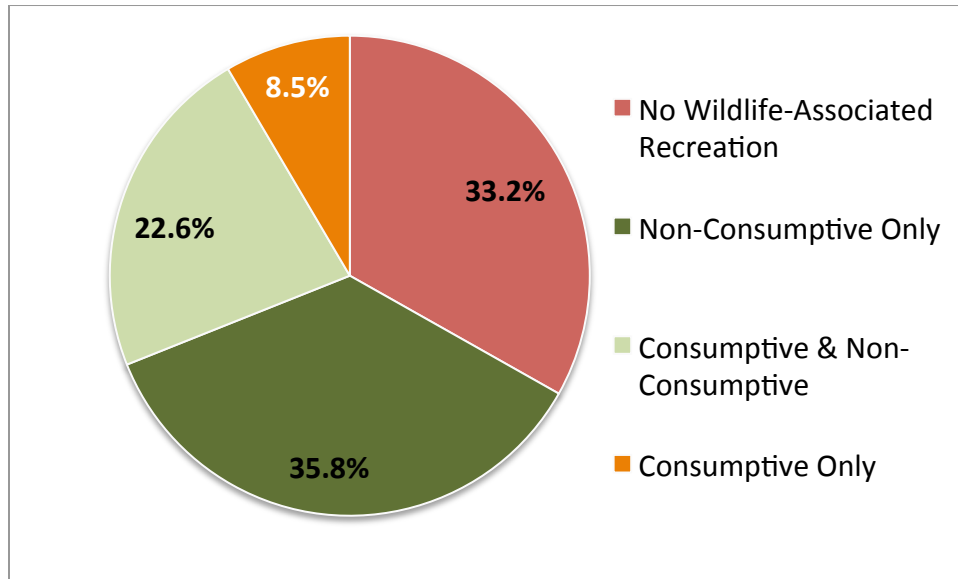


Figure 1. Percentage of respondents who believe wildlife possess intrinsic value.

Although these initial analyses indicate that the belief in intrinsic value differs little among various types of wildlife-users, these groups are not necessarily mutually exclusive, which could confound attempts to understand how participation in various forms of recreation impacts one’s belief in intrinsic value. These analyses make it clear that participation in wildlife-related recreational activities is *weakly* related with belief in intrinsic value. Nevertheless, there is also value in assessing a set of groups that are mutually exclusive. Categorizing respondents into mutually-exclusive groups based upon their participation in wildlife-associated recreation allowed us to examine the impact of any type of consumptive activity independent of non-consumptive activities. Results indicate that one-third (33%) of Ohio residents reported *no wildlife-associated recreation*, slightly more than a third

(36%) reported only *non-consumptive recreation* such as viewing, approximately 23% reported both *consumptive* and *non-consumptive* forms of recreation, while about 9% reported only engaging in *consumptive* forms of recreation (Figure 2a). Note that our data likely overestimate consumptive forms of outdoor recreation, which are more popular in rural area where our sampling effort was proportionally greater.



Results show the belief in intrinsic value is lowest among those who reported only engaging in the consumptive activities of hunting and trapping (68%; Figure 2b), followed by those who reported not engaging in any wildlife-associated recreation (76%), though confidence intervals for these estimates overlap (59.7-75.3% and 72.2-79.6%, respectively); belief in intrinsic value was highest among those who *only* engaged in non-consumptive recreation, followed by those who engaged in both consumptive and non-consumptive activities (85.7-92.3% and 78.8-87.5%, respectively).

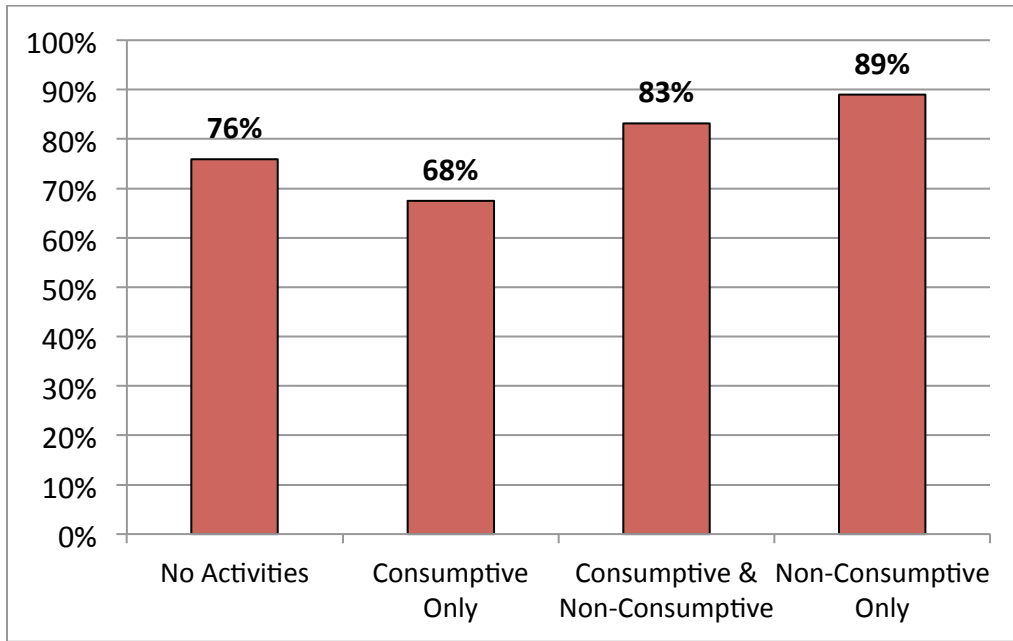


Figure 2b. Comparing belief in intrinsic value among consumptive and non-consumptive users of wildlife.

Social and demographic factors also exhibited small, but significant relationships with belief in intrinsic value (Figure 3). Level of education ($V = 0.17$) and income ($V = 0.14$) were positively related with belief in intrinsic value, while age ($R = -0.11$) and residence in an agricultural community ($\phi = -0.06$) were negatively related. Belief in intrinsic value was slightly higher for females (84%) than males (80%; chi-square = 5.28, $df = 1$, $p = 0.02$, $\phi = 0.04$). All of these relationships can be characterized as “small” (Cohen 1988), “low” (Davis 1971), or “minimal” (Vaske 2008).

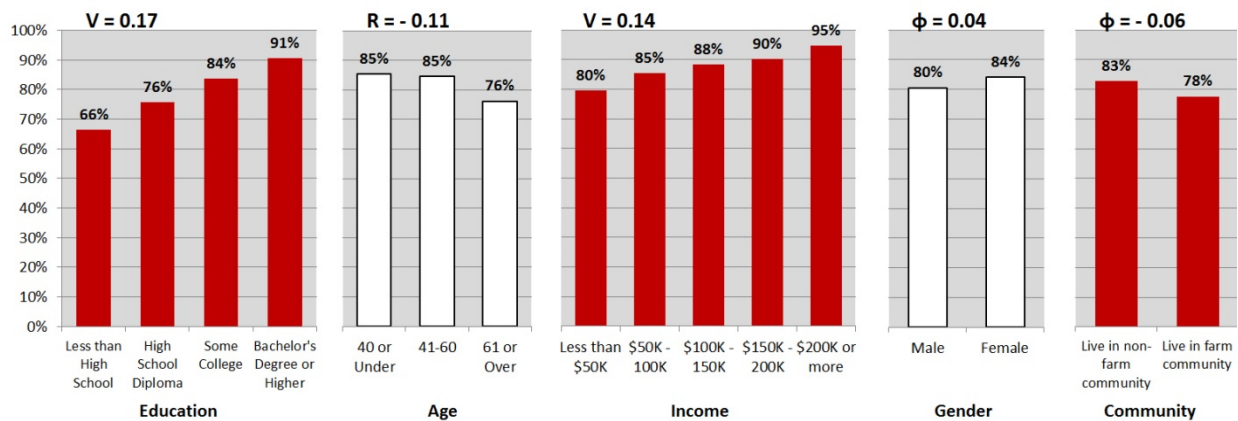


Figure 2. Belief in intrinsic value by various social and demographic characteristics.

Study 2. U.S. Residents

In the second study, data were collected from *KnowledgePanel*, a representative online panel of the U.S. general public maintained by The GfK Group (hereafter, GfK). GfK randomly selected panel participants using address-based sampling similar to that used in traditional mail surveys, as well as random digit dialing. If households sampled did not have access to the Internet or a computer, Internet access and a computer were provided by GfK. Households who agreed to participate with KnowledgePanel were placed into a pool of potential respondents and then recruited to participate in surveys via email or on the recruit's member webpage. For a detailed description of KnowledgePanel sampling, see Berrens et al. (2003) and The GfK Group (2013).

The study questionnaire was administered using *Qualtrics*, an online survey software package. A recruitment email was sent to the panel on 7 February 2014, explaining the purpose of the study, and included a web link to the questionnaire. The survey link remained active for 11 days. Those who did not complete the survey after 3 days were sent an email reminder asking them to participate in the research. If email reminders did not generate a response an automated telephone call was administered asking panel participants to take the survey.

A total of 2,020 potential respondents were contacted by GfK to complete the survey, resulting in 1,287 completed surveys (Northern Rocky Mountains $n = 406$; Western Great Lakes $n = 451$; and the remaining areas of the contiguous U.S. $n = 430$) for a response rate of 63.7%. Post-stratification weights for the sample were created based on benchmarks from the 2009—2011 American Community Survey conducted by the U.S. Census Bureau (www.census.gov/acs/www/), and were applied for the overall sample in all subsequent analyses. Specifically, post-stratification weights were developed to weight data for respondent (a) age, (b) race/ethnicity, (c) level of education, (d) household income, (e) census region, (f) metropolitan area residence, and (f) whether or not respondent had household access to the Internet. We used data weighted to reflect the U.S. population in all subsequent analyses.

Measurement. The two items employed in study one were replicated in the online panel. The only difference between these measures was the use of a 5-point scale, as opposed to the 7-point scale used in the initial study. Additionally, we assessed the extent to which respondents self-identified as “conservationists” using a single item: “To what extent do you identify with each of the following groups...Conservationist”. Respondents could select from the following categories: not at all, slightly, moderately, strongly, very strongly.

Results. Initial analyses of individual items again revealed strong endorsement of the intrinsic value statement (Wildlife have inherent value, above and beyond their utility to people), and rejection of the instrumental value statement (Wildlife are only valuable if

people get to utilize them in some way). Approximately 77% endorsed the first statement, and 84% disagreed with the later statement (Table 2). As with study 1, we dichotomized these two items into a single measure by reverse-coding the instrumental value statement, taking the average of the two, and then coding them such that 1=endorsement of intrinsic value, 0=ambivalence or rejection of intrinsic value.

Table 2. Percentage of U.S. Residents endorsing intrinsic and instrumental values.

Item	D	SD	N	SA	A
Wildlife are only valuable if people get to utilize them in some way.	63.9	19.6	11.5	4.5	0.5
Wildlife have inherent value, above and beyond their utility to people.	6.2	2.4	15.1	23.1	43.2
Response Scale: D=disagree, SD=Somewhat Disagree, N=Neither Agree nor Disagree, SA=Somewhat Agree, A=Agree					

After dichotomizing the variable results indicate approximately 81% of the U.S. adult population endorses intrinsic value (Table 3).

Table 3. Percentage of U.S. Residents endorsing intrinsic value (dichotomized measure).

Item Coding	n	%	Valid %	Dichotomized
	1.00	1	.1	.1
	1.50	4	.3	.3
	2.00	1	.1	.1
1-3 = 0 (reject or ambivalent); 3.5-5 = 1, endorse intrinsic value.	2.50	30	2.3	2.4
	3.00	208	16.2	16.2
	3.50	86	6.7	6.7
	4.00	189	14.7	14.8
	4.50	175	13.6	13.7
	5.00	586	45.5	45.8
	Total	1281	99.6	100.0
	Missing	6	.4	
Total		1287	100.0	

Finally, a more conservative means of assessing intrinsic value involves cross-tabulating the two items to determine consistency among respondents. Running the analysis this way indicates that 69.4% of U.S. residents endorse intrinsic value of wildlife unequivocally—that is they both rejected the instrumental value statement *and* agreed with the intrinsic statement (Table 4). This type of analysis suggests that 10.5% express weak endorsement

of intrinsic value (i.e., they endorse intrinsic value in one statement and express neutrality in the other), 6.9% were neutral toward both statements, 10.5% were inconsistent (i.e., they either disagreed with both or agreed with both statements), 2.4% express weak belief in *instrumental* value (i.e., they endorse instrumental value in one statement and express neutrality in the other), and only 0.3% expressed unequivocal belief in instrumental value. This more conservative method suggests that the percentage of Americans who endorse intrinsic value is between 69 and 80%--still a substantial majority.

Finally, we were interested in how people who self-identify as “conservationists” relate to the concept of intrinsic value. We cross-tabulated the conservative measure of *belief in intrinsic value* described in the above paragraph (see Table 4) with a response item that asked respondents, “To what extent do you identify... [as a] conservationist”. Our analysis indicates that more than 3/4s (78%) of those who *strongly* identified as conservationists (n=180) expressed strong belief in intrinsic value. Likewise, 90% of those who identified *very strongly* as conservationists (n=101) expressed a strong belief in intrinsic value, while among those who did *not at all* identify as a conservationist (n=175) strong belief in intrinsic value drops to 59%. These data show that although the belief that wildlife possesses intrinsic value is wide-spread among society in general, it is a defining feature of what it means to be a conservationist.

Table 4. Cross-tabulation of items used to assess intrinsic value.

		<i>Instrumental Value Statement.</i>				
		Disagree	Somewhat Disagree	Neither	Somewhat Agree	Agree
<i>Intrinsic Value Statement.</i>	Disagree	74	0	1	4	0
	Somewhat Dis.	6	21	4	0	0
	Neither	51	28	88	26	0
	Somewhat Agree	101	127	46	21	0
	Agree	586	74	9	7	5
Totals	Description					Percent
888	Strong belief in IV (Disagree with Instrumental, agree with Intrinsic)					69.4%
134	Weak belief in IV (endorse IV in one, neutral in other)					10.5%
88	Noncommittal (neutral toward IV both)					6.9%
31	Weak non-belief (endorse instrumental in one, neutral in other)					2.4%
4	Disbelief in IV (disagree with Intrinsic, agree with Instrumental)					0.3%
134	Inconsistent/confused (indicate belief in IV in one but not the other)					10.5%
N=1279						100.0%
Intrinsic Value Statement: "Wildlife have inherent value, above and beyond their utility to people"; Instrumental Value Statement: "Wildlife are only valuable if people get to utilize them in some way".						