

THESIS

HOW WILDLIFE VALUE ORIENTATIONS RELATE TO BROADER
CULTURAL CONSTRUCTS

Submitted by

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In partial fulfillment of the requirements

For the Degree of Master of Science

Colorado State University

Fort Collins, Colorado

Summer 2022

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ABSTRACT

HOW WILDLIFE VALUE ORIENTATIONS RELATE TO BROADER CULTURAL CONSTRUCTS

Previous research suggests that studying human thought processes in relation to broad cultural constructs holds promise for strengthening the application of the social sciences to wildlife management and conservation, and through this paper we attempt to advance those efforts. Researchers in social and cross-cultural psychology have long studied cultural constructs, in particular tightness-looseness and individualism-collectivism, shown as powerful dividers in contrasting cultures. While it is known that cultural differences exist, the extent of the strength of variance and if these cultural elements can be systematized to make generalized predictions about effects on cognitions is not clear.

The theory of wildlife value orientations (WVOs) suggests that WVOs are interlinked with cultural constructs, including broad cultural ideologies described as egalitarianism and domination, or mastery, and that they are embedded in a hierarchy of cognitions. However, explicit tests of these relationships are largely lacking. As proposed by a multilevel model applied in recent WVO research in the U.S., forces of modernization (e.g., increased wealth, education, urbanization) have changed culture via a shift in the social-ecological context, which in turn has prompted a shift from domination to mutualism WVOs. As modernization has changed discrete aspects of culture, the ideology of egalitarianism believed to underly mutualism has become more pervasive, and persons have increasingly begun to view animals relationally as non-human others and less as a resource to be mastered. It would then follow that collectivist cultures, strong in egalitarianism values, may exhibit a tendency towards holding a mutualist orientation. Similarly, as tight cultures show greater

propensity to exert inward group pressure, they may also exhibit a tendency toward outward control of their environment as is seen in a domination WVO.

Here, we used data collected in a pilot study during the spring of 2015, along with additional data from the 2018 *America's Wildlife Values* project, to investigate whether WVOs have significant correlations with collectivism and individualism and tightness and looseness. Results of this research show that, while tightness and looseness show a linkage, collectivism and individualism are not significantly related to WVOs. This discovery is notable as it informs not only how conservation and wildlife management messaging may need to be structured for greatest efficacy, but it reveals that the mode and messenger may be of equal importance. We discuss the implications of these findings for conservation, as well as additional research needs to further elucidate the connection between WVOs and broader cultural constructs.

ACKNOWLEDGEMENTS

The author would like to acknowledge and thank the following individuals for their support and contribution to this effort: Michael Manfredo, Tara Teel, Kim Henry, Kurt Kraiger, Alia Dietsch, Andrew Don Carlos, Alan Bright, Leeann Sullivan, Faculty at Colorado State University and Front Range Community College, and Research Assistants Dee Cox and Erin Mihm.

DEDICATION

This thesis is dedicated to Angela White, whose constant support and love were immeasurable and inexorable, and also to my children, Jordan, Eleanor and Edith who bring constant joy, love, and meaning to my life.

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ARTICLE

Introduction

The theory of wildlife value orientations (WVOs) suggests that desired human-wildlife relationships are transitioning from domination to mutualism in the U.S (Manfredo et al., 2009; Manfredo et al., 2021a; Manfredo et al., 2021b). According to this theory, value orientations are defined as reflections of broader cultural ideologies that serve to orient one's values toward a particular domain such as wildlife (Manfredo et al., 2009). The mutualism WVO is believed to reflect the influence of an egalitarian ideology, whereas the domination WVO reflects a view of human mastery, or domination, over wildlife. The practical implications of this observation are critical, as they reveal a cultural shift that is contributing to declines in hunting participation, policy shifts and conflict over treatment of wildlife (Manfredo et al., 2017b).

The cultural ideology of domination was widely prevalent throughout the European immigration to North America and is proposed to have been borne from the Protestant Reformation (Manfredo et al., 2016). Both domination and individualism undergirded the rapid economic and political growth in North America and contributed to many of the core tenets of capitalism and the Cartesian sciences (Hofstede, 2001; Kristol, 1975; White, 1967). Hofstede (2001) notes that the Protestant ethic and the spirit of capitalism were driving forces in the modernization of countries, particularly the U.S.

WVO theory suggests that, over the past century, a growing modern lifestyle removed the populace from direct contact with wildlife and aided the process of increased anthropomorphism, leading people to see wildlife as more human-like and afford them the consideration of being part of their social community. That is, people began to adopt mutualist values toward wildlife. Longitudinal data in the U.S. supports this conclusion of a shift from domination to mutualism WVOs (Manfredo

et al., 2021a). It is important to note, however, that the change is not believed to be emanating from a broad-based shift in cultural ideals, but rather it is a shift in categorization of items in our environment (Manfredo et al., 2019). Wildlife became part of the egalitarian domain of consideration (ideology about relationships in our social community) instead of a mastery ideology, and this proposal raises intriguing questions about the relationship between WVOs and broad cultural constructs. Here, we sought to explore such questions by examining potential linkages between WVOs and the cultural constructs of collectivism-individualism and tightness-looseness, which have been widely applied in social and cross-cultural psychology (Lu et al., 2021; Boldt, 1978).

Theoretical Background

Beginning with the work of Homer and Kahle (1988), cognitions have been broadly understood as a series of internal, linear, and sequential processes that can be arranged within a "cognitive hierarchy". This approach stacks values, attitudes, and behaviors along a directional path of cognition to action (Homer & Kahle, 1988), and brings together the study of all processes under a cognitive view of culture (Shore, 1998). The approach is typified in the successful, and seemingly ubiquitous, application of value-attitude-behavior (VAB) theory to conservation issues (e.g., Cerri et al., 2017; Fulton et al., 1996). However, the past 30 years of research in psychology have seen an increase in advancing a "multilevel systems model" of cognition, wherein thought processes are viewed as dynamic and adaptive and part of a complex web of interactions (Kitayama & Park, 2010; Kitayama et al., 2010; Manfredo et al., 2017; Schurz et al., 2021; Toates, 2006;). These advances have aided our understanding of how individuals interpret and process information, what drives their actions, and how they evaluate actions, events, and other sentient beings (Rumelhart, 2017). According to this more recent approach, because cognitions are adaptive to an individual's environment, they vary across individuals and cultures due to environmental accommodations and

constraints (Chuang, 1998; Gelfand, Nishi, & Raver, 2007; Kitayama et al., 2010; Oishi & Diener, 2009). The cultural constructs of collectivism-individualism and tightness-looseness have drawn much interest in this context due to the proposed centrality of their position and level of embeddedness within the larger system of interactions. Here we sought to explore relationships between these cultural constructs and WVOs, which are seen as extensions of broader values and cultural ideologies.

Social Values

Drawing from theory in social psychology, the basic characteristics of values most widely agreed upon are: they transcend most situations; they are stable and enduring and are central to a person's cognitive structure; they are relatively few in number; they are formed early in life; and they are comprised of fundamentally emotion-laden beliefs (Kluckhohn, 1951; Manfredo et al., 2004; Rohan, 2000; Rokeach, 1973; Schwartz, 1992). The multilevel systems view of values put forth by Manfredo et al. (2017a) proposes that values are embedded within cultural ideologies and are inclusive of an individual's varied thought processes and behavioral patterns. This systems view embraces the idea that values are goals that are learned, can be articulated, are related to our natural and social surroundings, and shape an array of behaviors that are manifest in symbolism, communication patterns, material culture, and daily routines (Kitayama et al., 2010; Manfredo et al., 2017a). According to Manfredo et al. (2009), value orientations are influenced by broader cultural ideologies and are reflected in the schematic networks of beliefs that organize around values and provide contextual meaning to those values in relation to a particular domain such as wildlife. Value orientations connect ideologies and behaviors by providing direction in relationships, such as the relationships between humans and animals. Wildlife conservation can benefit from studies of WVOs, which have shown strong predictive validity, explaining variation in public attitudes and behaviors across a myriad of wildlife-related topics and stakeholder groups (Manfredo et al., 2021b).

Cultural Constructs

Collectivism-individualism. A multilevel view of cognitions links the cultural constructs of collectivism and individualism (CI) to values and individual action. Collectivism is marked by within-culture emphases in harmony, relatedness, and connection. Conversely, individualism is marked by an emphasis on self-direction, autonomy, and self-expression (Markus & Kitayama, 2003). In a collectivist society, such as Japan, it does not benefit the individual to differentiate themselves from others, as it could serve as a detriment to personal gain and societal placement (Kitayama, 2014; Markus & Kitayama, 2003). “The poppy that stands tallest is not offered the protection of fellow poppies if they are buffeted by the wind, and a nail that sticks out of the wood is considered a hazard or anomaly and must be corrected by being hammered back down” (Kitayama, Personal communication, August 10, 2014). In Japan, self-esteem is an academic abstraction, personal preference is seemingly nonexistent, and even individual choice is seen as a burden (Markus & Kitayama, 2003). Conversely, self-agency (Gallagher, 2000), self-actualization (Goldstein, 1939) and rising above one’s own peers are encouraged in independent societies such as the United States (Kitayama, 2014; Markus & Kitayama, 2003). In individualistic societies there is greater attention paid to happiness, and greater egocentricity in social relations and behaviors (Kitayama et al., 2010). Individualism is advantageous out of conquest, notably similar to the aforementioned mastery (domination) ideology and is exemplified in Western expansionist culture which fostered individualism. Individualism and the domination WVO would appear conceptually oriented towards having mastery over one’s environment, self, and individual capacities and interests (Inglehart, 1997; Manfredo et al., 2009; 2021b). In contrast, collectivism and the mutualism WVO are conceptually oriented towards commonality, mutual dependence for support, the well-being of all, and an egalitarian existence (Manfredo et al., 2009; 2021b ; Markus & Kitayama, 1991).

Tightness-looseness. Tightness and looseness are broad cultural constructs that represent normative influences within the multilevel system. As noted by Cialdini and Trost (1998), social norms are rules and standards that are agreed upon and understood by group members, and these rules guide social behaviors without the force of law. Tightness-looseness (TL) theory was largely established by Peltó (1968) and is differentiated from values and CI, as of the concept captures the overall strength of social norms and tolerance of deviance from those norms within groups (Gelfand et al., 2011). "Tight" societies hold strong social norms and exhibit low tolerance for behavior that does not conform to those norms. "Loose" societies, on the other hand, hold relatively weak social norms and exhibit high tolerance for behaviors that may differ from those norms (Gelfand et al., 2007). This framework has been used to explore differences across societies, cultures, and geographic regions (Boldt, 1978; Peltó, 1968). More recently, Lu et al. (2021) used this framework to analyze mask use during the Covid-19 outbreak and Gelfand et al. (2021) explored the difference between countries in their ability to limit Covid-19 cases and deaths linked to cultural variation in the strength of social norms. In an earlier study of 33 nations, Gelfand et al. (2011) found that the tight or loose characteristic of a culture was influenced by ecological factors and social threats. Tightness tended to be a characteristic of cultures that are vulnerable to factors such as natural disasters, disease, resource paucity, and other external threats, whereas cultures that are less vulnerable to these factors showed a proclivity toward looseness. Harrington and Gelfand (2014) discovered that ecological and historical conditions among the 50 U.S. states created variance in TL. Like individualism, tightness is believed to be an adaptation arising out of environmental stress. Tight societies are believed to be developed as an adaptation to threat and are typified by the prioritization of the good of the group over the welfare of the individual. Specifically, tightness occurs in societies that experience greater vulnerabilities to negative environmental interactions, in which the group seeks to exert control to mitigate these external forces (Gelfand et al., 2011). This is

similar to a domination WVO, tied to Schwartz's (1992) power and mastery dimensions, which are oriented toward exerting control and dominance over resources and the natural environment in assertive, pragmatic, and even exploitative ways (Schwartz, 2006).

Objectives

To add to our understanding of the relationships between WVOs and these broader cultural constructs, we sought to test if WVOs have significant correlations with CI and TL. This study contributes to ongoing applications of CI and TI frameworks in the social sciences, including recent applications to highly timely topics such as the aforementioned Covid-19 situation. This study also seeks to enhance the practical applications of WVOs and related concepts through an understanding of the greater sociocultural context of wildlife conservation and management (Manfredo et al., 2020).

Our tested objectives were:

- O₁: To explore if collectivism is correlated with a mutualism WVO.
- O₂: To explore if individualism is correlated with a domination WVO.
- O₃: To explore if tightness is correlated with a domination WVO.
- O₄: To explore if looseness is correlated with a mutualism WVO.
- O₅: To examine the relationship between WVOs and preferences for wildlife management.

This objective aimed to add to previous research demonstrating the predictive validity of WVOs and thereby enhance the practical implications of our work.

Methods

To test the relationship between CI and WVOs and to examine the relationship between WVOs and wildlife management preferences, we collected data via a survey of undergraduate

students (age range: 18-26) enrolled in spring 2015 psychology, natural resource, English, and communication classes at Colorado State University (CSU) and Front Range Community College (FRCC) in Fort Collins, Colorado. Fixed response questions were also used to collect data on gender, education, income, racial/ethnic background, and area of residence (urban or rural). Respondents were additionally asked to indicate past participation in hunting, fishing, and wildlife viewing. To test the relationship between TL and WVOs, we analyzed data that was collected through the *America's Wildlife Values* survey (Manfredo et al., 2018; Appendices). Survey administration instruments and procedures were reviewed and approved for use with human subjects by the Colorado State University Institutional Review Board for the 2015 study (Protocol 14-5322H) and for the 2018 study (Protocol 049-17H).

WVOs and CI

Objectives 1 and 2 were tested using data from the 2015 study. Prior to administration of the survey, participants were briefed on each part of the instrument with the same directions and structure as established in existent literature (Kitayama et al., 2010; Teel & Manfredo, 2009; Uskul et al., 2008). All surveys were completed via physical survey taken onsite, and participants were given as much time as needed to complete all sections.

Domination and mutualism WVOs were measured according to prior research with composite scales consisting of 19 items representing basic beliefs about wildlife and wildlife management (Manfredo et al., 2009; Teel & Manfredo, 2009; Appendices). Respondents rated their level of agreement with belief items on a scale ranging from 1 (strongly disagree) to 7 (strongly agree). A domination orientation was indicated in the final approach by beliefs corresponding to two dimensions: hunting and use of wildlife. A mutualism orientation was also described in relation to two belief dimensions: caring and social affiliation.

CI was accessed through two tests, one measuring an individual's symbolic sense of self (Kitayama et al., 2010) and the other measuring their cognitive processing biases (Uskul et al., 2008). Cognitive processing bias was measured by presenting participants with 20 triads of three objects each (e.g., pictures of short pants, long sleeved shirt, and a button) and asking them to indicate which two of the three objects went together (see Figure 1). In all cases, two of the three objects shared either a relational grouping (e.g., shirt and button), and two of the three objects shared a category (e.g., shorts and shirt). For each participant, the total number of categorical groupings was subtracted from the total number of relational groupings across all triads to yield a measure of holistic cognition (i.e., preference for items that relate to one another vs. what categories they may be put into). A categorical processing style shows a tendency towards individualism, and a relational processing style shows a tendency towards collectivism (Uskul et al., 2008).

PART 2

Each of the following pages has a picture of three different objects on it. The two objects at the top of the page are labeled A and B. The bottom object has an arrow pointing to it.

Decide whether object A or object B GOES WITH the object that has the arrow pointing to it. Circle your choice, A or B. Do not spend too much time on any single item. There are no right or wrong answers.



A



B



What goes with this ? A or B

Figure 1 – Cognitive processing triad example

An individual's symbolic sense of self was measured by examining the size of bubbles drawn by each respondent in their sociogram, which is a hand-drawn diagram of their immediate social network (see Figure 2). With the help of a research assistant, we measured the width of each self-bubble at its widest point in millimeters (see Figure 2). We then averaged the friend-bubble widths for each participant and created a ratio of the size of the self-bubble relative to the average size of

the friend-bubbles as our measure of self-inflation. If a value is greater than 1, it indicates that the symbolic self is “inflated” relative to others. A simple difference score was computed by taking the self-bubble minus the average of the friend-bubbles. However, computing a ratio helps control for individual variation in drawing styles not related to self-inflation. A symbolic self-inflation shows a tendency towards individualism, whereas a balanced symbolic self shows a tendency towards collectivism (Kitayama et al., 2010).

PART 3

In this task, we would like you to create what is known as a socio-gram. This is basically a picture of your friend’s relationship to you, and to each other. You will start by putting yourself in an oval on the following page. Next, draw ovals around you with the initials of your friends, and connect your friend to you with a line. If any two friends you graph are themselves friends, draw a line between the two.

This is a sample socio-gram, which is about a hypothetical network of 4 friends. You have relationships with Friend A, B, and C. Friend A and Friend B are themselves friends, but Friend B has another friend who is not directly your friend. Friend C is your friend that is not a friend of (or does not know) your other friends.

You can make as complex a socio-gram as you want. **Please only use initials of friends rather than full names**, and please indicate after the initials F if the person is female, M if the person is male, or O for other.

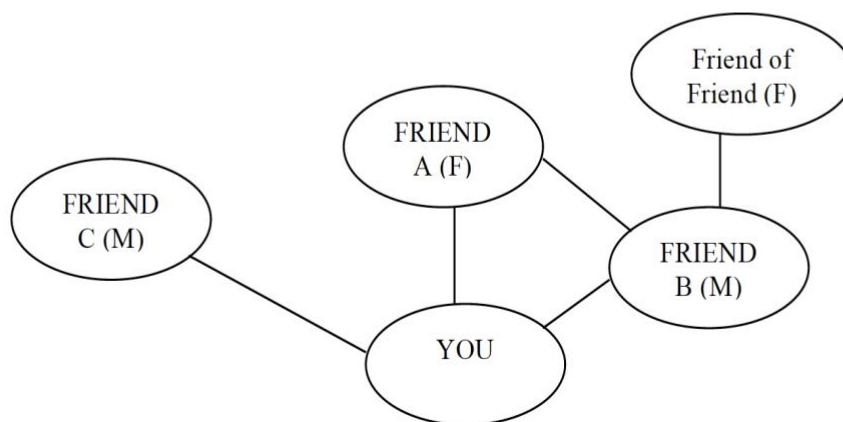


Figure 2 – Sociogram example

WVOs and TL

Objectives 3 and 4 were tested with data ($n = 43,949$) from *America's Wildlife Values* survey (Manfredo et al., 2018). Data were collected via administration of a mail survey with an online option to a random sample of residents in each of the 50 states during 2017-2018 (see Appendix). Two pilot studies were conducted in 2016, testing mail, telephone, and email panel methods to inform decisions about final data collection mode. Given low response rates that are increasingly a challenge for U.S. public surveys (Keeter et al., 2017; Stedman et al., 2019), samples were supplemented in each state with an email panel survey. To boost response in underrepresented racial and ethnic categories, a separate follow-up email panel survey targeting these groups was also conducted (see Manfredo et al., 2018 for more detailed methods).

WVOs were measured, as in the 2015 study, using the same set of 19 survey items representing basic beliefs about wildlife and wildlife management (Manfredo et al., 2009; Teel & Manfredo, 2009; Appendices). Measurement of TL on an individual level was accomplished using the method previously advanced by Gelfand et al. (2011). As done in Harrington and Gelfand's (2014) study, we measured TL via a six-item Likert scale that assessed the degree to which social norms are pervasive, clearly defined, and reliably imposed within nations (See Appendices). Their items were modified in our instrument to say "state" instead of "country" due to the intent of the 2017-2018 study to collect state-level data for fish and wildlife agencies (e.g. "In this state, there are clear expectations for how people should act in most situations").

WVOs and Wildlife Management Preferences

For objective 5, wildlife management preferences were measured with two survey items: "Wildlife management decisions should be made for the public as a whole, as opposed to individuals with a vested interest" and "Private property rights are more important than protecting wildlife for

the greater good to society.” Respondents rated their level of agreement with the two items on a scale ranging from 1 (strongly disagree) to 7 (strongly agree). Items were intended to reveal a respondent’s preferences toward benefit to the individual or benefit to society (Manfredo et al., 2009; 2021b).

Data Analysis

Data were analyzed in SPSS v. 25 (Chicago, Illinois). We conducted reliability analysis to examine the internal consistency of WVO scales, CI measures and the TL scale. To compute WVO scores, we assigned respondents a score for each belief dimension (e.g., wildlife use), computed as the mean of all items within that dimension. We then assigned a value orientation (e.g., domination) score by computing the mean of corresponding belief dimension scores. We segmented respondents into one of four WVO types by comparing their scores on domination and mutualism simultaneously. High scores were defined as > 4.50 , whereas low was defined by scores of ≤ 4.50 . Traditionalists scored high on domination, low on mutualism; Mutualists scored high on mutualism, low on domination; Pluralists scored high on both scales; and Distanced scored low on both (Teel & Manfredo, 2009).

To compute Gelfand’s (2011) individual level TL scale scores, items were reverse-coded when necessary to show tightness as higher scores. Respondents were also asked if they viewed their state as having a tight culture. Second-level measurement of TL was accomplished using Gelfand’s (2014) U.S. state-level TL classification results along with aggregated state-level percentages of WVO types from the *America’s Wildlife Values* survey. We conducted correlational analysis (Pearson’s r) to test relationships between WVOs and our other measures (CI, TL, wildlife management preferences).

Results

WVOs and CI

Results of reliability analysis were in line with previous research on WVOs, showing high internal consistency: domination $\alpha = .828$ and mutualism $\alpha = .863$. Reliability analysis also showed high internal consistency for CI measures, which includes cognitive processing biases ($\alpha = .802$) and symbolic sense of self ($\alpha = .989$). The students surveyed at CSU and FRCC were largely mutualist (45%), with pluralists (26%) and traditionalists (20%) also well-represented within the sample ($n = 369$). The sociogram revealed that the majority of our sample (68%) was oriented towards individualism, with the remaining 32% scoring as collectivist. These results follow the established range in existing literature on CI (Kitayama et al., 2010). However, in contrast to the sociogram results, 93% of our sample scored as thematic cognitive processors (linked to collectivism), and only 7% were categorical processors (linked to individualism). In our analyses there were no correlations between either of the CI measures and mutualism and domination WVO scales (Table 1).

Table 1 – Correlations between WVOs and CI and wildlife management preferences

Correlations of Domination & Mutualism WVOs, Cognitive Processing Biases, and Sociogram							
		Domination	Mutualism	Cognitive Processing Biases	Sociogram	Wildlife management decisions should be made for the public as a whole, as opposed to individuals with a vested interest	Private property rights are more important than protecting wildlife for the greater good to society
Domination	Pearson Correlation	1	-.405**	.035	-.017	-.169**	.397**
	Sig. (2-tailed)		.000	.510	.742	.001	.000
	n	368	368	351	358	365	365
Mutualism	Pearson Correlation	-.405**	1	-.011	-.018	.273**	-.346**
	Sig. (2-tailed)	.000		.838	.740	.000	.000
	n	368	368	351	358	365	365
Cognitive Processing Biases	Pearson Correlation	.035	-.011	1	-.014	-.053	-.053
	Sig. (2-tailed)	.510	.838		.793	.323	.329
	n	351	351	351	342	348	348
Sociogram	Pearson Correlation	-.017	-.018	-.014	1	.047	.025
	Sig. (2-tailed)	.742	.740	.793		.381	.636
	n	358	358	342	358	355	355
Wildlife management decisions should be made for the public as a whole, as opposed to individuals with a vested interest	Pearson Correlation	-.169**	.273**	-.053	.047	1	-.178**
	Sig. (2-tailed)	.001	.000	.323	.381		.001
	n	365	365	348	355	365	365
Private property rights are more important than protecting wildlife for the greater good to society	Pearson Correlation	.397**	-.346**	-.053	.025	-.178**	1
	Sig. (2-tailed)	.000	.000	.329	.636	.001	
	n	365	365	348	355	365	365

** Correlation is significant at the 0.01 level (2-tailed).

WVOs and TL

As with the 2015 study, reliability analysis revealed that our groupings of items into belief dimensions and value orientations provided a good fit for the 2017-2018 50-state study data (see Manfredo et al., 2018; 2020). We also found relatively high internal consistency for our TL scale ($\alpha = .763$). Analysis at the individual level yielded minimal significant correlation ($r = .10$) between

WVOs and TL. However, aggregate analysis revealed a strong relationship between percentages of WVO types by state and the level of tightness per state as measured by Harrington and Gelfand (2014). The percent of traditionalists per state was positively correlated with Gelfand's state-level tightness measure ($r = .540$), and the percent of mutualists was negatively correlated with tightness ($r = -.647$). The percentage of mutualists within a state was also negatively correlated ($r = -.49$) with the percentage of respondents in the *America's Wildlife Values* survey who viewed their state as having a tight culture (Figure 3). Conversely, the percentage of traditionalists within a state was positively correlated ($r = .51$) with the percentage of respondents who viewed their state as having a tight culture (Figure 4). These findings are consistent with theory, and also affirming that the second-level measurements by Harrington and Gelfand (2014) are related to self-reported state-level tightness. In looking at the cultural patterns at the second level, it may be that they are influenced by factors not found at the individual level, as groups are more than a collection of individual attributes (Kozlowski & Klein, 2000), and they possess emergence (downward force) (Manfredo et al., 2017).

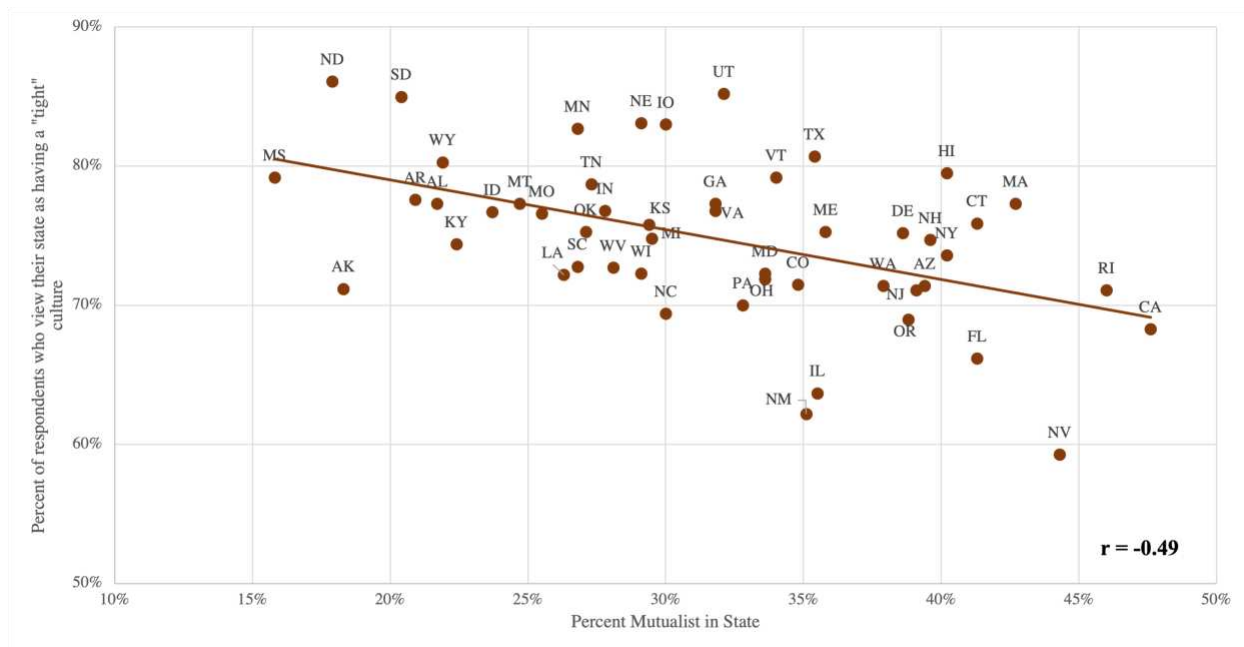


Figure 3 – State level percent mutualist by tight culture

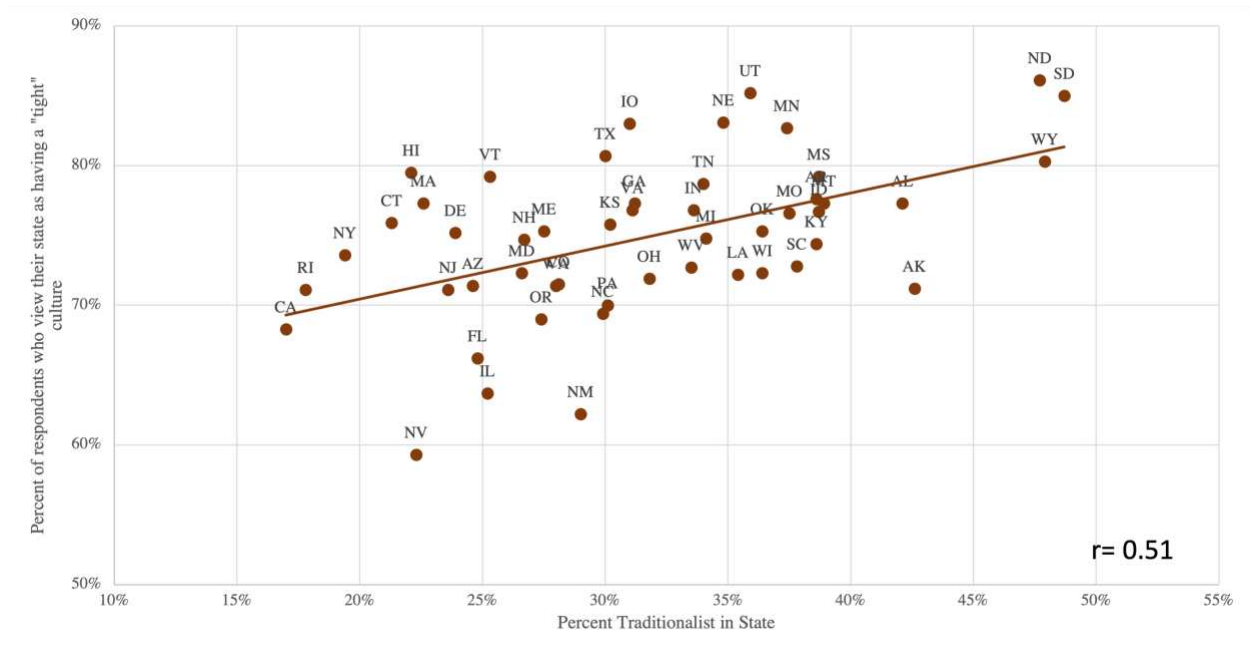


Figure 4 – State level percent traditionalist by tight culture

WVOs and Wildlife Management Preferences

Mutualism was positively related, with a moderate effect size, to whether wildlife management decisions should be made for the public as a whole, as opposed to individuals with a vested interest (Table 1). In contrast, domination had a negative association with this statement, with a small effect size. These results reveal that mutualists are more likely than those with a domination WVO to consider public interests to be more important than individual interests in wildlife management decision-making. Mutualism had a significant negative relationship with the belief that private property rights are more important than protecting wildlife for the greater good to society (Table 1). As has been elucidated in other WVO studies (Manfredo et al., 2018), those scoring higher on mutualism were more likely to disagree with this statement. Domination had a positive association with this statement, linked to greater agreement, but with a small effect size.

Conclusion

Unveiling a piece of culture is noteworthy, and the discovery of substantial group-level correlations between social tightness and a domination value orientation towards wildlife is compelling. As social tightness is stronger in rural America (Harrington & Gelfand, 2014), it fits that we found a strong correlation at the state level with domination, a finding that aligns with similar research showing that rural parts of the U.S. have a higher prevalence of domination (Manfredo et al., 2021) and that rural right-winged adherents engage in higher levels of animal use and consumption (Dhont & Hodson, 2014). As tight groups adhere to a strict “right” and “wrong” in pursuit of their goals, the prevalence of other expressed cultural constructs may increase. We see this in the elevated presence of a domination WVO in rural places, which may be perceived as more threatening, as these places do not possess a buffer from environmental factors that may threaten residents' livelihood or safety. Rural residents thus may seek to protect themselves from and master their environment, and the goal of survival is bolstered by tight societal norms. Viewing wildlife as a resource to be dominated and protected against fits with the findings of Harrington and Gelfand (2014) which showed that tight states have greater ecological vulnerabilities, food insecurity and poverty rates; suffer natural resource paucity; have increased natural disasters; and have high levels of external threats. With increased challenges to securing a group's survival, the need to gain mastery over the surrounding environment, including wildlife, also increases.

As a group phenomenon between people and places, both TL and WVOs may have evolved, in part, due to external forces which created normative tightness and a value of mastery of one's environment. This discovery expands the systems view of how values operate and interact at a group level, as the normative structure of TL may predict WVOs. Additionally, this expands our understanding of how tight adherence to norms may produce similarities in thought processes and behaviors related to social values. While the United States scores relatively low (5.1) on a global scale

in Gelfand et al.'s (2011) comparison of 33 nations, within-nation results across the U.S. show that states, such as Mississippi, Alabama, and Arkansas, that exhibit the highest measured adherence to normative structures, also have a high percentage of individuals who possess a domination WVO (Manfredo et al., 2018).

Our findings regarding the lack of a correlation between CI and WVOs is no doubt surprising, as the tested concepts both exist on a personal level, are oriented conceptually towards “others,” and are seemingly theoretically similar as they reflect broader cultural ideologies. WVOs have been shown to relate to other elements of culture such as ancestry (Manfredo et al., 2016), so why then are they not linked to the ideologies of CI? While it is possible that these discrete constructs developed through chance adaptation and emanated from different places and at different points in time in human evolution, it is also possible that the CI instruments we employed may be measuring another concept. Additionally, we argue that the lack of correlation could be related to methodological issues within this study. Due to the narrow scope of the 2015 study, CI measurement may have been hindered by a limited student population. Deploying the sociogram instrument in person with a student population followed established theory (Kitayama et al., 2010) as it requires uses pencil and paper to complete and would therefore need to be adapted, if possible, for use in other survey administration modes (e.g., online). Though piloting behavioral studies with “WEIRD” populations at Western universities has been questioned by some (Henrich et al., 2010), there has been further research that shows no measurable difference between student participants and online participants (Casler et al., 2013). Regardless, we feel it is important that any future U.S. applications look for a wider instrument distribution, as it may yet tell a different story about the relationships we examined.

Future research is also needed, more generally, in the application of Uskul et al.'s (2008) full instrument in the U.S. to see if her original findings are reproducible in other populations. As our

cognitive processing bias findings do not line up with Uskul et al.'s (2008) stance that individualism fosters analytic thought as the individual is free from enmeshment with others and their goals, allowing those within an individualistic social system to focus on the attributes and categories of an object, it is of additional importance that their instrument also be implemented in other known independent societies.

Social values studies in the conservation context have repeatedly offered insights into preferred management practices (e.g., Dietsch et al., 2019; Manfredo et al., 2016; 2021b; Vaske & Donnelley, 1999), aiding practitioners in making decisions with reduced potential for conflict. Values may not be able to be changed for the sake of conservation (Manfredo et al., 2017), but they can be useful to examine for environmental and wildlife-related issues, as they often define the social context of management and can be used to predict public response to these issues (Manfredo, 2008; Manfredo et al., 2020; 2021b). As discovered here, the broader cultural construct of TL may also be used to enhance understanding of differences in how individuals and groups view wildlife, react to wildlife management policies, and perceive the goals and activities of their state wildlife agencies.

From an applied perspective, the values approach can enhance understanding of the complexity of public perceptions of wildlife management issues and policies, and how those perceptions vary across regions and stakeholder groups. As tight groups categorize others as in-group and out-group, it is important for agencies to consider not only the message, but the messenger. Sources that are in-group, or are supported by an in-group, may find greater receptivity and salience with their conservation or policy-related messaging. With a greater understanding of the social context of wildlife management, agencies may be able to craft more successful interventions that ultimately achieve desired outcomes. Additionally, agency employees have been shown to have higher levels of domination with respect to their WVOs, compared to the public (Sullivan et al., 2021). As an extension of our findings, it may also be true that they possess higher levels of

tightness, which could have implications for agency-public relationships and may be an important consideration for agency employee recruitment and retention efforts as well.

Exploring the relationship between values and other cultural constructs enhances our understanding of the multilevel approach to cognitive and behavioral processes discussed at the outset of this thesis. Our study, along with future research, can aid in unraveling how the web of interrelated cognitions is structured. Further, this study also suggests that seemingly similar concepts, such as CI and WVOs, may not actually be related.

With such a diversity of public preferences (Manfredo et al., 2018; 2020), wildlife agencies across the U.S. are having to adapt and embrace change or risk excluding entire groups from benefiting from management and budget decisions. On top of a broad cultural shift (Manfredo et al., 2021a), the in-state and cross-state/region variance of values can make a complex issue even more complicated. Answering the call for further applications of psychometric scales to advance understanding of stakeholders' relationships and interactions with wildlife (Whitehouse-Tedd et al., 2020), this study also may aid managers in making better-informed decisions about managing wildlife resources in more efficacious ways.

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APPENDICES

19 Wildlife Value Orientation items (2015 and 2018 studies)

PART 1

Below are statements that represent a variety of ways people feel about fish and wildlife and the natural environment. Please indicate the extent to which you disagree or agree with each statement. Circle one number for each statement.

	<u>Strongly Disagree</u>	<u>Moderately Disagree</u>	<u>Slightly Disagree</u>	<u>Neither</u>	<u>Slightly Agree</u>	<u>Moderately Agree</u>	<u>Strongly Agree</u>
1. Humans should manage fish and wildlife populations so that humans benefit.	1	2	3	4	5	6	7
2. We should strive for a world where humans and fish and wildlife can live side by side without fear.	1	2	3	4	5	6	7
3. We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing.	1	2	3	4	5	6	7
4. The needs of humans should take priority over fish and wildlife protection.	1	2	3	4	5	6	7
5. I view all living things as part of one big family.	1	2	3	4	5	6	7
6. Animals should have rights similar to the rights of humans.	1	2	3	4	5	6	7
7. Wildlife are like my family and I want to protect them.	1	2	3	4	5	6	7
8. It is acceptable for people to kill wildlife if they think it poses a threat to their life.	1	2	3	4	5	6	7
9. It is acceptable for people to kill wildlife if they think it poses a threat to their property.	1	2	3	4	5	6	7
10. It is acceptable to use fish and wildlife in research even if it may harm or kill some animals.	1	2	3	4	5	6	7

11.	Fish and wildlife are on earth primarily for people to use.	1	2	3	4	5	6	7
12.	Hunting is cruel and inhumane to the animals.	1	2	3	4	5	6	7
13.	It would be more rewarding to me to help animals rather than people.	1	2	3	4	5	6	7
14.	I care about animals as much as I do other people.	1	2	3	4	5	6	7

PART 1 continued

		<u>Strongly</u> <u>Disagree</u>	<u>Moderately</u> <u>Disagree</u>	<u>Slightly</u> <u>Disagree</u>	<u>Neither</u>	<u>Slightly</u> <u>Agree</u>	<u>Moderately</u> <u>Agree</u>	<u>Strongly</u> <u>Agree</u>
15.	People who want to hunt should be provided the opportunity to do so.	1	2	3	4	5	6	7
16.	I take great comfort in the relationships I have with animals.	1	2	3	4	5	6	7
17.	I value the sense of companionship I receive from animals.	1	2	3	4	5	6	7
18.	Hunting does not respect the lives of animals.	1	2	3	4	5	6	7
19.	I feel a strong emotional bond with animals.	1	2	3	4	5	6	7

TL six item scale questions

Q 10. The following statements refer to your state as a whole. Please indicate the extent to which you disagree or agree by *selecting one answer for each statement.*

	Strongly Disagree	Slightly Disagree	Neither	Slightly Agree	Strongly Agree
There are many social norms that people are supposed to abide by in this state.	☐	☐	☐	☐	☐
In this state, there are clear expectations for how people should act in most situations.	☐	☐	☐	☐	☐
People agree upon what behaviors are appropriate or inappropriate in most situations in this state.	☐	☐	☐	☐	☐
People in this state have a great deal of freedom in deciding how they want to behave in most situations.	☐	☐	☐	☐	☐
In this state, if someone acts in an inappropriate way, others will strongly disapprove.	☐	☐	☐	☐	☐
People in this state almost always comply with social norms.	☐	☐	☐	☐	☐

GLOSSARY

WVO	Wildlife Value Orientation(s); A directional relationship of value towards wildlife, possessed by an individual or group. Measured by: rating 19 value statements about human-wildlife relationships
CI	Collectivism – Individualism; Collectivism is marked by within-culture emphases in harmony, relatedness, and connection. Conversely, individualism is marked by an emphasis on self-direction, autonomy, and self-expression (Markus & Kitayama, 2003). Measured by: completing a socio-gram (Figure 2) and responding to cognitive triads (Figure 1)
SN	Social Norms; rules and standards that are understood by members of a group, and that guide or constrain social behaviors without the force of law (Cialdini and Trost, 1998).
TL	Tightness – Looseness; Social Norms that inform individual and group relationships. "Tight" societies hold strong social norms and exhibit low tolerance for behavior that does not conform to those norms. "Loose" societies, on the other hand, hold relatively weak social norms and exhibit high tolerance for behaviors that may differ from those norms (Gelfand et al., 2007) Measured by: a six-item Likert scale that assessed the degree to which social norms are pervasive, clearly defined, and reliably imposed within nations. 2nd level measurement was done by Harrington & Gelfand (2014) and measured (i) the legality of corporal punishment in schools, (ii)

the percentage of students hit/punished in schools, (iii) the rate of executions from 1976 to 2011, and (iv) the severity of punishment for violating laws (i.e., selling, using, or possessing marijuana). Two items reflect latitude/permisiveness: (i) access to alcohol (i.e., ratio of dry to total counties per state) and (ii) the legality of same-sex civil unions. Institutions that reinforce moral order and constrain behavior were assessed with two items: (i) state-level religiosity and (ii) percentage of individuals claiming no religious affiliation. The final indicator was the percentage of total population that is foreign.