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Measuring cultural values and beliefs about environment to identify their role in climate change responses

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ABSTRACT

Cultural perspectives shape responses to climate change. This research examines 'myths of physical nature' outlined in cultural theory. Patterns of values and beliefs about the environment are described as 'cultural biases', which legitimize four ways of life – worldviews. We test whether cultural biases about the environment have the same structure as those about society. Study 1 details sound psychometric measures developed through a survey of Australians (n = 290). Study 2 replicates the measures (n = 5081), and demonstrates their predictive validity in relation to climate change beliefs and self-reported pro-environmental behaviors. Two negatively correlated dimensions are identified that differ from the grid-group framework. Individualistic and fatalistic perspectives frame the environment as 'elastic' to justify damaging behaviors. Hierarchical and egalitarian perspectives frame the environment as 'ductile' to justify environmental conservation. Theoretical implications and differences to established measures of environmental concern and worldview are discussed.

1. Introduction

Conflicting cultural values and beliefs influence what people chose to believe and do in response to contentious public debates (Douglas & Wildavsky, 1982; Kahan, 2010; Thompson, Ellis, & Wildavsky, 1990; Wildavsky & Dake, 1990). Polarized opinions about the evidence, allocation of blame, and solutions for managing risk, has seen controversy arise over climate change (Kahan et al., 2012; Leiserowitz, 2006). This is evidenced by the radically different 'interpretive communities' who contest the meaning of dangerous climate change, taking either alarmist or contrarian positions (Leiserowitz, 2005). Individual perceptions of climate change are informed more by personal experiences, values, and worldviews than they are by scientific considerations like global climate models, greenhouse gas concentrations, social vulnerability, or adaptive capacity (Dessai et al., 2004). The cultural interpretations of risk shaping the climate change debate derive from the very modes of production, consumption, and social organization that give rise to carbon emissions (Adger, Barnett, Brown, Marshall, & O'Brien, 2013). This presents challenges in terms responding to climate change, as people tend to reject notions that undermine their patterns of behavior and social interaction (Kahan, 2010). Consequently, societal risk perceptions have downplayed the scale and significance of the threat from climate change to justify inaction (Leiserowitz, 2006; Weber, 2006). The overwhelming scientific consensus regarding harmful anthropogenic climate change has done little to convince society to act on unchecked carbon emissions and adopt pro-environmental behaviors (Bain, Hornsey, Bongiorno, & Jeffries, 2012).

To reduce carbon emissions the cultural dimensions of climate change must first be recognized (Adger et al., 2013), and the determinants of pro-environmental behavior better understood (De Groot & Steg, 2010). Although a growing number of studies have explored pro-environmentalism a lack of clarity has seen key terms like 'environmental attitudes', 'environmental concern' and 'environmental worldview' poorly defined (Milfont & Duckitt, 2010; Schultz et al., 2005). The current research examines how environmental worldview is conceptualized by focusing on the 'myths of physical nature' construct outlined in cultural theory (Douglas & Wildavsky, 1982; Thompson et al., 1990). Here, patterns of shared values and beliefs about the environment are described alternatively as 'cultural biases', which represent partial perspectives about reality (Wildavsky, 1987). By critically reviewing the operationalization of cultural biases about the environment we discuss how measurement shapes the way this concept is understood.

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Empirical findings drawn from measures incompatible with their theoretical foundations are questioned. Not only is the misapplication of cultural theory identified as problematic, but so too are elements of the theory itself. The emphasis on cultural values and beliefs about society, rather than environment, is highlighted as an area requiring further development. This research offers and tests this development. It explores whether shared values and beliefs about the environment have the same structure as those about society. Factors influencing individuals' perceptions of and responses to climate change are examined. The research aims to test how cultural biases shape environmental worldview, carbon-relevant attitudes, and pro-environmental behaviors.

Pro-environmental behaviors often involve personal sacrifices for the long-term interest of the collective or the environment (Nordlund & Garvill, 2002). For instance, behaviors with beneficial environmental outcomes can result in increased costs, effort, or inconvenience, whilst simultaneously resulting in reduced status, comfort, and opportunities (Steg & Vlek, 2009). Recycling, conserving energy, buying sustainable products, and reducing car or air travel are examples of pro-environmental behaviors that forgo immediate personal benefits for future environmental benefits (De Groot & Steg, 2009). The framing of pro-environmental behaviors as a form of altruism has been widely explored in a number of theoretical frameworks. These include the value-belief-norm (VBN) model (Stern, 2000; Stern, Dietz, Abel, Guagnano, & Kalof, 1999); actively caring hypothesis (Geller, 1995); self-transcendent versus self-enhancement value orientations (Schwartz, 1992, 1994); and social-altruistic, biospheric and egoistic values (Stern & Dietz, 1994). Numerous empirical findings support a value-basis of environmental behavior as being motivated by pro-social rather than pro-self values (De Groot & Steg, 2009). Some argue, however, that pro-environmentalism is related to broader notions of self that include other living things (Schultz, 2002). As such, individual differences in the extent to which 'nature' is included in people's representations of self may account for the relationship between pro-social values and environmental behavior (Schultz et al., 2005).

The relationship between values and environmental behavior is clouded by a lack of precision in the conceptual language used to define key terms (Schultz et al., 2005). Schultz et al. offer clarification, referring to: environmental concern as "the affect associated with environmental problems"; environmental attitudes as "the collection of beliefs, affect, and behavioral intentions a person holds regarding environmentally related activities or issues. From this perspective, environmental concern is one aspect of an environmental attitude"; and environmental worldview as a "person's belief about humanity's relationship with nature" (p. 458). An example of the interchangeable use of these terms can be found in discussion of the "world's most widely used measure of environmental concern" (Dunlap, 2008, p3) – the new environmental paradigm (NEP). Described as an environmental belief in the VBN model (Stern, 2000), the NEP was developed in recognition of a changing environmental worldview challenging society's dominant social paradigm that nature exists solely for human use. Humans are framed as being part of, rather than independent from, natural systems (Dunlap & Van Liere, 1978). The NEP was designed to measure eco-centrism by tapping beliefs regarding the balance of nature, limits to growth, and human superiority over nature. This definition is clearly aligned with environmental worldview, and has been found to share features with the egalitarian cultural bias about the environment (Portinga, Steg, & Vlek, 2002).

Cultural biases about society and the environment are thought to legitimize four ways of life which have been variously termed cultural 'rationalities', 'solidarities' or 'worldviews' (Thompson et al., 1990). Four worldviews (hierarchical, egalitarian, individualistic and fatalistic) are distinguished along two dimensions in cultural theory's grid-group framework (Dake, 1991; Douglas, 1970). The grid dimension describes the extent of social prescriptions constraining individual behavior, or the degree of social regulation and role definition (Wildavsky, 1987). The group dimension describes the strength of group boundaries and ties among members, or the emphasis placed on the needs of the collective. The four worldviews were originally derived from cultural biases about social relations (Douglas, 1978). Cultural biases about the environment were later integrated into the four worldviews in a post-hoc fashion, upon identification of patterns in ecosystem management (Schwarz & Thompson, 1990; Thompson et al., 1990). It was assumed that they would fit within earlier formulations of cultural biases about society; however, empirical results suggest that they may not be as linked as previously thought (Grendstad & Selle, 2000).

The overwhelming majority of research has been concerned with cultural biases about social relations (Grensted & Selle., 2000), resulting in the development of several dimensional measures (Dake, 1992; Ellis & Thompson, 1997; Grendstad, 2003; Kahan, Braman, Gastil, Slovic, & Mertz, 2007; Marris, Langford, & O'Riordan, 1998; Rippl, 2002). To our knowledge, there is just one dimensional measure of cultural environmental biases (Lima & Castro, 2005). This measure reflects the assumption that cultural biases about environment have the same dimensional structure as those about society. As this is yet to be rigorously tested, the influence of cultural environmental biases on environmental attitudes and behaviors remains unclear. Sound psychometric measures are required to clarify what role cultural environmental biases play in the climate change debate. It is precisely this gap that the current research addresses. Study 1 details the development of a dimensional measure of cultural environmental bias. Study 2 builds on this by replicating the measure and assessing its predictive validity in relation to climate change beliefs and pro-environmental carbon-relevant behaviors. The research is guided by the following questions: 1) Do cultural environmental biases have the same structure as cultural biases about social relations? More specifically, do cultural environmental biases demonstrate two orthogonal factors reflecting grid and group dimensions, or four correlated factors of hierarchical, egalitarian, individualistic and fatalistic dimensions? 2) Are cultural environmental biases related to environmental attitudes and beliefs associated with climate change? Is there a direction relationship between cultural environmental biases and carbon-relevant behaviors, or is the relationship mediated through climate change beliefs?

1.1. Cultural theory: cultural values and beliefs about society and environment

Cultural theory (Douglas, 1978, 1985; Douglas & Wildavsky, 1982) is an effective framework for understanding the conflicting opinions about society and the environment that drive the climate change debate (Adger et al., 2009; Leiserowitz, 2006, 2005, 2007; O'Riordan & Jordan, 1999; Pendergraft, 1998; Thompson, 2003). It explains why people perceive dangers differently and selectively attend to information providing useful insights into contested risks. Different opinions about the setting, problem, and protagonists result in different policy preferences and behavioral strategies for managing risk (Verweij et al., 2006). Although originally developed from ethnographic studies as socially constructed patterns of values and beliefs (Douglas, 1985; Douglas & Wildavsky, 1982) cultural biases have been applied quantitatively in surveys as traits, or orienting dispositions, in risk perception (Dake, 1991; Jenkins-Smith & Herron, 2009; Kahan et al., 2007; Lima & Castro, 2005; Peters & Slovic, 1996; Steg & Sievers, 2000; Silva & Jenkins-Smith, 2007). Cultural biases about society and the environment, and the