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What is This?

Environmental Consequences of the Desire to Dominate and Be Superior

Taciano L. Milfont[1], Isabel Richter[1], Chris G. Sibley[2], Marc S. Wilson[1] and Ronald Fischer[1]

Abstract

A belief in human dominance over nature lies at the heart of current environmental problems. In this article, we extend the theoretical scope of social dominance theory by arguing that social dominance orientation (SDO) is an important variable in understanding person–environment relations. We argue that individuals high in SDO are more willing to exploit the environment in unsustainable ways because SDO promotes human hierarchical dominance over nature. Four studies provide support for this perspective. High SDO was associated with lower levels of environmental concern in a nationally representative New Zealand sample (Study 1) and in country-level data across 27 nations (Study 2). SDO was also positively related to utilization attitudes toward nature (Study 3) and mediated the gender difference in beliefs about anthropogenic climate change (Study 4), and both occurred independently of right-wing authoritarianism. Implications for the human-dominated view of nature subscribed to by those high in SDO are discussed.

Introduction

A belief in human dominance over nature is central to understanding current environmental problems. This dominance orientation has emerged from several domains, including religious beliefs (White, 1967) and cultural value orientations (Kluckhohn, 1953). Such culturally patterned religious beliefs and value orientations center on humans seeing themselves as separate from nature and as more worthy than other organisms—thus having dominance rights. The concept of "dominant social paradigm" popularized by Pirages and Ehrlich (1974) illustrates this line of thinking, which expresses anthropocentrism and the view that the natural world was created for the benefit of humankind. Perceived dominance over nature is also associated with an instrumental view of person–environment relations (Stokols, 1990), wherein the ecosystem is seen to have value only as a means to human thriving. These perspectives portray nature as important only for what it contributes to human welfare, but not important in itself.

Human dominance over nature may be conceptually linked to social dominance theory (SDT), an influential theory of intergroup relations proposed by Sidanius and Pratto (Pratto, Sidanius, Stallworth, & Malle, 1994; Sidanius & Pratto, 1999). SDT proposes that there are measurable differences in the extent to which individuals tend to favor hierarchical social dominance over egalitarian relations. Central to this theory is the individual-level variable of social dominance orientation (SDO), characterized as "a generalized orientation towards and desire for unequal and dominant/subordinate relations among salient social groups, regardless of whether this implies ingroup domination or subordination" (Pratto, Sidanius, & Levin, 2006, p. 282), and "the degree to which individuals desire and support group-based hierarchy and the domination of 'inferior' groups by 'superior' groups" (Sidanius & Pratto, 1999, p. 48).

Although intrinsically linked to group-based social hierarchies and relations between individuals, the dominance focus of SDT may be appropriately broadened to the hierarchical relations between humans and the natural environment. In the present article, we expand the theoretical scope of SDT to include human relations with the natural environment by arguing that SDO is an important variable in understanding person–environment relations and an important negative predictor of environmentalism—here broadly defined as concern for the environment, and support for environmentally friendly

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attitudes, intentions, and behaviors. We argue that individuals high in SDO may be less concerned about environmental issues, and more willing to exploit the environment in unsustainable ways, because SDO expresses a standpoint that favors human hierarchical dominance over nature. From this perspective, human dominance over nature can be understood as an extension of SDO.

In the first part of the article, we outline the major propositions of SDT regarding intergroup relations and group-based social hierarchies, including the idea of *legitimizing myths* and SDO (Sidanius & Pratto, 1999). We argue that ideologies relating to human dominance over nature function as legitimizing myths justifying the exploitation and destruction of the natural environment. Next, we outline conceptual connections between SDT and human attitudes toward nature, and summarize past empirical studies that support the existence of our proposed link between greater SDO orientations and lower environmentalism. Finally, we describe four empirical studies specifically exploring our argument.

SDT

SDT posits that individuals in postindustrial societies show variation in their desire to achieve and maintain hierarchically organized social structures in which some groups dominate and have more power than other groups (Pratto et al., 1994; Sidanius & Pratto, 1999). This predisposition, in turn, leads individuals to endorse and promote legitimizing myths that justify the uneven distribution of power and status within society. Sidanius and Pratto (1999) argued that legitimizing myths "consist of attitudes, values, beliefs, stereotypes, and ideologies that provide moral and intellectual justification for the social practices that distribute social value within the social system" (p. 45).

SDT proposes (among its other premises) that individuals differ in their basic motivation to achieve and maintain hierarchical social structures (i.e., their level of SDO), and that individuals fulfill this basic motivation by promoting and endorsing legitimizing myths. Ideologies such as modern or symbolic racism (e.g., McConahay & Hough, 1976) and endorsement of meritocratic processes for distributing wealth are typical legitimizing myths often studied within a social dominance framework. According to SDT and other general group-dominance perspectives (Jost & Banaji, 1994), these ideologies function as legitimizing myths because they promulgate hierarchical social structures between groups by providing moral and intellectual justifications for social practices that maintain systemic inequalities in power, status, and the distribution of resources between dominant and disadvantaged groups. Hierarchy-enhancing legitimizing myths are those supporting greater levels of group-based social inequality (e.g., fate, meritocratic policies, political conservatism), whereas hierarchy-attenuating legitimizing myths are those justifying and supporting group-based social equality (e.g., socialism, communism, universal rights).

Duckitt (2001) and others (Altemeyer, 1998; McFarland & Adelson, 1996) have shown that SDO is one pathway to group-based oppression, with a second pathway involving the related construct of right-wing authoritarianism (RWA; comprising authoritarian submission, authoritarian aggression, and conventionalism, Altemeyer, 1981, 1996). In combination, SDO and RWA predict around half of the variation in measures of prejudice (McFarland & Adelson, 1996). A dual-process model to explain individuals' prejudiced attitudes has shown that different domains of generalized prejudice relate differentially to SDO and RWA (Duckitt, 2000, 2001, 2006). Although this dual-process model has been applied chiefly to studies of prejudice, it is possible that SDO and RWA predict environmentalism. As the review of past studies presented below shows, SDO and RWA are in fact negatively associated with environmentalism. However, as individuals scoring high in SDO tend to favor dominance and hierarchical relations—which can be extended into dominance over nature, as we postulate, and which is not a defining characteristic of RWA—we would presume that SDO accounts for a significant amount of additional variance in environmentalism over and above RWA. This contention is also empirically examined in studies presented in this article.

Extending SDT: The Case of Environmental Dominance

We contend that the legitimizing myths proposed by SDT are not necessarily limited to ideologies regarding ethnicity, age, gender, or other observable and stable group-based stratifications. Our reading of SDT indicates that individuals high in SDO should be motivated to endorse a broad range of ideologies that help to justify inequality and support a desire for domination in its many forms. We therefore suggest that SDO should also predict support for ideologies or myths promoting the exploitation of natural resources and human hierarchical dominance over nature.

There are several hierarchy-enhancing legitimizing myths that justify and support human dominance over nature. These myths include (Judeo-Christian) anthropocentrism (Schultz, Zelezny, & Dalrymple, 2000; White, 1967), cultural value orientations such as Kluckhohn's (1953) "humans over nature" and Schwartz's (1999) "mastery" values, and individualistic social solidarity and related myths of nature as proposed by Douglas' cultural theory (Douglas & Wildavsky, 1982). What all these hierarchy-enhancing ideas and principles have in common is the notion of human dominance over nature. These myths express the belief that it is right, appropriate, and necessary for nature and all natural phenomena and species to be used and altered for human objectives and welfare.

Contradicting these ideas are hierarchy-attenuating legitimizing myths that justify and support harmony with nature, and serve to promote the importance of nature in itself. These myths include Kluckhohn's "humans in nature" and

Schwartz's "harmony" value orientations, and egalitarian social solidarity and related myths of nature as proposed by Douglas' cultural theory (for a recent review, see Milfont, 2012). Such hierarchy-attenuating myths emphasize the preservation of nature and of the diversity of natural species in their original natural state, and the need to protect nature from human use and alteration. Support for the empirical distinction between environmental hierarchy-enhancing and hierarchy-attenuating myths comes from studies showing that environmental attitudes form two broad dimensions of utilization and preservation attitudes toward nature (Milfont & Duckitt, 2004, 2006, 2010; Wiseman & Bogner, 2003).

While the legitimizing myths addressed by SDT focus specifically on those myths either supporting and justifying social inequality among social groups or supporting and justifying social equality, the underlying notion is that these myths portray ideologies that impel societies to be more or less hierarchical. The environmental myths presented above are also arguably ideologies that impel societies to be more or less hierarchical—specifically toward nature. We therefore argue that SDT can be logically extended to encompass the hierarchical relations between humans and the natural environment, and SDO should also express human-based hierarchical views toward nature. Given that SDO reflects a preference for unequal relations along a superior–inferior dimension (Pratto et al., 1994), individuals who are higher in SDO should also tend to favor unequal relations between humans and the natural environment, in which humans are seen as superior and nature inferior.

In summary, we argue that SDO not only expresses a generalized orientation toward unequal relations between humans but also between humans and the natural environment, conveying the degree to which an individual desires and supports the domination of nature by humans. That is, the desire to dominate and be superior reflected by high SDO should extend to human dominance over nature. From this perspective, SDO appears not only relevant to intergroup relations but also as a central individual-difference variable for predicting environmentalism. We postulate that individuals who exhibit high SDO will tend to favor hierarchy-enhancing ideologies supporting human dominance over nature, whereas those who exhibit low SDO will tend to favor hierarchy-attenuating ideologies supporting human harmony with nature. More specifically, SDO should be negatively correlated to environmentalism. Below, we review specific empirical studies examining the associations between SDO and environmentalism.

Support for the Link Between Social Dominance and Environmental Dominance

Most of the extant literature examining associations between SDO and environmentalism has included pro-environmental attitudes and behaviors merely as external variables that provide auxiliary information on the validity of SDO. Moreover, where past studies have assessed attitudes toward topical issues concerning the environment, these have been intertwined with political ideologies, rather than being purely "environmental" issues. We are the first to provide explicit and comprehensive theoretical and conceptual links between SDO and psychological work on environmental attitudes and behaviors. Nevertheless, previous empirical studies examining the associations between SDO and environmentalism provide support for our propositions and serve as a background for our own empirical work.

In one of the first publications on SDT, Pratto et al. (1994) reported correlations between SDO and support for environmental policies. Correlations between SDO and support for pro-environmental policies were negative, with an average of −.38 across three samples. Wang (1999) also found a negative correlation between SDO and pro-environmental attitudes, as measured by the New Environmental Paradigm (NEP) Scale—which measures a contrasting worldview to that expressed in the dominant social paradigm described earlier—but the correlation was only strong and statistically significant for women in the sample ($r = −.38$, $p < .01$). Wang also assessed the relationship between the NEP Scale and RWA, again reporting that the correlation was only statistically significant for women in the sample ($r = −.36$, $p < .01$). Examining the associations between SDO, RWA, and environmentalism, Milfont and Duckitt (2010) found that SDO and RWA were negatively and statistically related to general pro-environmental attitudes (−.26 and −.22, respectively, with no gender comparison reported).

Altemeyer (2003) conducted two role-playing team simulations exploring what might happen to "earth" if those high in RWA and in SDO were the dominant population. Simulation participants were divided into sessions according to their level (high vs. low) of RWA or SDO, and were cast in roles as citizens from major geographic regions of the world, in which they were asked to make a series of decisions. The first simulation indicated that human and environmental outcomes would be much better over a 40-year period if the earth had a "population" entirely of individuals with low RWA; whereas with a high-RWA population, outcomes included overpopulation, hunger and disease, and a nuclear holocaust. Although the outcomes of the simulation are somewhat conjectural (Mandel, 2003), the negative environmental trends Altemeyer showed are supported by a number of studies showing a negative correlation between RWA and environmentalism (Fritsche, Cohrs, Kessler, & Bauer, 2012; Iwata, 1977; Peterson, Doty, & Winter, 1993; Ray, 1980; Sabbagh, 2005; Schultz & Stone, 1994; Zelezny & Pollitt, 1996).

In the second simulation with a new sample, Altemeyer (2003) compared possible outcomes for "populations" comprising participants with high RWA combined with low SDO (Session 1) or high SDO (Session 2). Very poor population outcomes were estimated at the end of both sessions, with no

attempts to prevent global environmental problems or create welfare institutions to provide support for those with deprived economic circumstances or poor health. However, while in Session 1 there was very little interaction between geographic regions, individuals in Session 2 who were high in SDO and RWA (or the so-called "Double Highs") became the leaders of their geographic regions and led negotiations and meetings with (and some acts of war against) other regions. Notably, their negotiations on climate change challenges did not produce any united effort to deal with the issue. Altemeyer (2003) interpreted these differences as indicating that individuals high in RWA are "authoritarian followers," while those high in SDO are "authoritarian leaders."

A similar pattern of results was reported in a set of studies by Son Hing, Bobocel, Zanna, and McBride (2007) who examined whether Double Highs made more unethical decisions than other individuals. They found that more high-SDO participants (14) than low-SDO participants (5) favored the unethical decision to move production of a household-cleaning product that creates a toxic by-product to a less developed nation. Conversely, more low-SDO participants (10) than high-SDO participants (5) favored more ethical environmental decisions. They also observed that a high-SDO leader with high-RWA followers made decisions that prioritized profit over environmental and humanitarian concerns.

Other scholars have also drawn theoretical connections between SDO and environmentalism, even if not reporting empirical evidence in their own study (e.g., Boschetti, Richert, Walker, Price, & Dutra, 2012; Feygina, Jost, & Goldsmith, 2010; Markowitz, Goldberg, Ashton, & Lee, 2012). In conjunction, these empirical and conceptual links suggest that SDO is related to dangerous and unethical environmental decisions.

The Present Study

The empirical studies reviewed above provide support for our environmental dominance account by showing that greater SDO is associated with lower levels of environmentalism. Considering that no previous study has explicitly focused on how SDT can help us understand current environmental issues, the main objective of the present study is to provide further empirical support for our dominance account through four studies. The goal of Study 1 was to establish that SDO is negatively associated with environmentalism in a nationally representative sample. If SDO is indeed linked to environmental dominance, we should observe lower aggregate environmentalism in countries with higher aggregate support for SDO. Study 2 tests this prediction by examining the associations between country-level SDO scores and a number of country-level indicators of pro-environmental engagement.

We expand the initial studies in two substantial ways in Study 3. First, we specifically examine the associations

between SDO and environmental hierarchy-enhancing and hierarchy-attenuating myths described earlier. Second, we explore whether SDO still predicts environmentalism when RWA is taken into account. This is important because many studies have shown a negative correlation between RWA and pro-environmental attitudes and behaviors (e.g., Fritsche et al., 2012; Schultz & Stone, 1994). The inclusion of RWA is also important because it would extend findings described by Altemeyer (2003) and Son Hing et al. (2007) when the combined influence of SDO and RWA is considered. Finally, the inclusion of RWA is in line with recent theoretical developments in the area on a dual-process account connecting SDO and RWA (Duckitt, 2001). Study 3 first examines bidirectional correlations between SDO/RWA and environmentalism, and then examines the extent to which SDO adds incremental predictive power over and above RWA.

In the last study, we examine the interplay between SDO, gender, and environmentalism. A number of studies have shown that women tend to express more pro-environmental concerns, attitudes, and behaviors than men (e.g., Dietz, Kalof, & Stern, 2002; Milfont & Duckitt, 2010; Zelezny, Chua, & Aldrich, 2000). At the same time, SDT contends that gender differences in the expression of prejudice (with men tending to express more prejudice than women) are a result of men having higher SDO. This implies that SDO mediates the gender difference in expressions of prejudice and also a range of sociopolitical attitudes; an implication that has received empirical support (e.g., Pratto, Stallworth, & Sidanius, 1997; Whitley, 1999; Wilson & White, 2010). Study 4 examines the extent to which SDO also mediates the well-documented gender differences in environmentalism (Zelezny et al., 2000).

Study 1

Method

Participants. Study 1 involved a nationally representative sample of New Zealanders, using data from the New Zealand Attitudes and Values Study 2009 (NZAVS-09). The NZAVS-09 sampled 1.36% of all New Zealand registered voters who were more than 18 years old. A total of 40,500 questionnaires were sent out to registered voters, of which 16.6% were returned, equating to 0.23% of the New Zealand registered voter population. Of the 6,518 participants who returned questionnaires, 59.3% were female, 71% explicitly identified as New Zealand European, and 17.1% identified as Māori (the indigenous population of Aotearoa/New Zealand). Ages ranged from 18 to 98 ($M = 48$, $SD = 15.78$).

Measures

SDO scale. The NZAVS-09 included six randomly sampled items from the SDO scale, with an equal number of dominance items (e.g., "To get ahead in life, it is sometimes okay to step on other groups") and equality items (e.g., "It

would be good if groups could be equal"). The specific SDO items used were Items 3, 4, 7, 9, 12, and 13 from Pratto et al. (1994, Appendix C). Participants rated the items on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). After reverse coding relevant items, the scale score was computed by averaging over items (Cronbach's α = .69).

Environmental values and climate change beliefs. A single value item from the Schwartz Value Survey (Schwartz, 1992) was used: "Protecting the environment (preserving nature)." Participants rated this value as a guiding principle in their life on a 9-point importance scale ranging from −1 (*opposed to my values*) to 7 (*of supreme importance*). The NZAVS-09 also included two climate change belief items: "Climate change is real" and "Climate change is caused by humans." Participants rated each of these items on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Results and Discussion

Supporting predictions, high SDO was significantly associated with lower endorsement of environmental protection and lower levels of agreement with climate change beliefs in a nationally representative sample. Specifically, SDO was negatively associated with preserving nature (r = −.19, 95% confidence interval [CI] = [−.21, −.17], p < .001, n = 6,455), with the belief that climate change is real (r = −.19, [−.21, −.17], p < .001, n = 6,400), and with the belief that climate change is caused by humans (r = −.16, [−.18, −.14], p < .001, n = 6,349). These correlations remained similar in size and statistical significance when partial correlations were performed controlling for age, gender, socioeconomic status, and ethnicity.

Study 2

The objective of Study 2 was to assess the relationship between country-level SDO and pro-environmental indicators that have been reported across countries. Associations between SDO and environmentalism on the country level of analysis would provide further evidence for the effect of social dominance on environmentalism—especially because SDO can be integrated into a general ideological value system at the society level (Fischer, Hanke, & Sibley, 2012). It is also important to investigate the predicted associations at the individual and country levels of analysis because SDO has different determinants at each level. Individual differences in SDO are determined by four general classes of variables: group status, gender, socialization, and temperament (Sidanius & Pratto, 1999). Across countries, however, differences are based on three groups of predictors: institutional discrimination, macroeconomic conditions, and broader societal-level values orientations and ideologies (Fischer et al., 2012).

Of interest to our research, Fischer et al. (2012) examined the relationships between country-level SDO and country-level endorsement of Schwartz's (1999) mastery and harmony values, which are, respectively, related to legitimizing myths justifying and supporting contrasting human relations to nature (dominance vs. harmonious fit). Fischer et al. found that greater country-level SDO was associated with higher endorsement of mastery values (r_s = .50, p < .05) when rank-order correlations were performed. Although in the predicted direction and moderately strong in size, the rank-order correlations between country-level SDO and harmony values did not reach significance (r_s = −.37, p > .05). When a multi-level meta-analysis was performed to examine these associations while controlling for study characteristics, the associations between country-level SDO and mastery and harmony values were in the predicted direction, but neither was statistically significant. Nevertheless, when taken together, these results support our prediction that SDO should also be negatively associated with indicators of environmentalism at the country level.

Method

Measures

SDO scale. For the country-level SDO score, we used data from Fischer et al. (2012), who reported SDO-level mean scores for 27 countries. A total of 190 effect sizes from 95 published articles with a total sample size of 50,371 participants were included in their meta-analytical study. The majority of participants were university students (76.8%) and female (59.2%).

Pro-environmental indicators. We used five indices to assess country-level environmentalism, one representing an objective indicator and four representing more subjective indicators. The objective indicator was the 2010 Environmental Performance Index (http://epi.yale.edu/), which is created by environmental experts and ranks 163 countries based on their scores on 25 performance indicators. These indicators are grouped across 10 policy categories within two broader areas: (a) environmental public health (effects of water and air pollution on humans, and environmental burden of disease) and (b) ecosystem vitality (effects of water and air pollution on ecosystems, biodiversity and habitat, forestry, fisheries, agriculture, and climate change).

The first subjective indicator was the country-level score from a meta-analysis of studies using the NEP Scale in 36 countries (Hawcroft & Milfont, 2010). Dunlap and Van Liere (1978; Dunlap, Van Liere, Mertig, & Jones, 2000) developed the NEP Scale with the theoretical argument that it was possible to identify an emerging ecocentric system of beliefs that challenged the dominant anthropocentric system. The NEP Scale is arguably the most widely used measure to assess pro-environmental attitudes (Dietz, Stern, & Guagnano, 1998). Examples of NEP items include "We are

approaching the limit of the number of people the earth can support" and "Humans have the right to modify the natural environment to suit their needs" (reversed). Most of the 36 studies included in this meta-analysis considered university students (31.66%) and representative samples (28.78%), and samples were composed of primarily female participants (53.73%).

Another subjective indicator included was mean of environmental concern for 26 countries given by Franzen and Meyer (2010) in their Table 1. They used nine items from the 2000 International Social Survey Programme to calculate the country-level scores. Examples of items: "How willing would you be to accept cuts in your standard of living in order to protect the environment?," "I do what is right for the environment, even when it costs more money or takes more time," and "We worry too much about the future of the environment and not enough about prices and jobs" (reversed). For most of the participating countries, a nationally representative sample of the adult population (aged 18 years and older) was drawn and respondents participated in face-to-face interviews. For the sample considered in Franzen and Meyer's article, sample size ranged from 507 (Northern Ireland) to 1,269 (Chile), and gender was evenly distributed (51% male; A. Franzen, personal communication, January 31, 2013).

Finally, we included two country-level indicators from a study conducted by Liu and Sibley (2012), who assessed the importance of global warming (rated on a 7-point scale, anchored by *not at all important and extremely important*), and intentions to make personal sacrifices to help protect the environment: "Would/are you willing to make sacrifices in your standard of living (e.g., accept higher prices, drive less, and conserve energy) in order to protect the natural environment?" (rated on a 7-point scale, anchored by definitely no and definitely yes). Data were collected from a sample of 6,511 primarily university students (60.8% female) from a range of disciplines in 34 developing and developed countries.

Results and Discussion

Spearman's rank-order (rho) correlations were computed between the scores because of the ordinal nature of the data. CI calculations appropriate for Pearson's correlations (Cumming, 2012) were applied to obtain CIs for these rank-order correlations to illustrate the range of ranks.

Country-level SDO was negatively correlated to all country-level indicators of pro-environmental engagement. The specific correlations between SDO and the country-level indicators were: Environmental Performance Index ($r_s = -.57$, [−.79, −.23], $p = .003$, $n = 25$), the NEP Scale ($r_s = -.08$, [−.60, .49], $p = .79$, $n = 13$), environmental concern ($r_s = -.25$, [−.74, .41], $p = .47$, $n = 11$), global warming importance ($r_s = -.02$, [−.61, .59], $p = .94$, $n = 11$), and

willingness to make self-sacrifice for the environment ($r_s = -.51$, [−.80, −.02], $p = .04$, $n = 16$).

One limitation of this study is that most of the country-level indicators relied on a small number of countries with samples predominantly composed of women and undergraduate students. Another limitation is that only two of the correlations were statistically significant, which might be explained by the small sample size at the country level. Nevertheless, the overall pattern of correlations supports a weak-to-moderate (average of −.29) negative association between SDO and environmentalism at the country level. All in all, these findings support predictions by showing that greater aggregate support for SDO in a country is associated with lower objective environmental quality, reduced environmental concern, and less willingness to act in favor of the environment.

Study 3

The previous studies showed a consistent pattern linking greater SDO to lower environmentalism across individuals and across countries. However, the first two studies do not demonstrate whether SDO can predict environmentalism when accounting for RWA. It is possible that SDO and RWA are equal and interchangeable predictors of environmentalism given that previous studies have shown strong negative effects between both of these two variables and pro-environmental attitudes and behaviors. Study 3 tested this possibility by first examining the bidirectional correlations between SDO and RWA with environmentalism, and then examining the extent to which SDO adds predictive power.

Method

Participants. An anonymous questionnaire was administered to students enrolled in introductory psychology classes at the University of Auckland, New Zealand (data from Milfont & Duckitt, 2010, Study 1). A total of 314 students took part in the study, but only 150 students (69.3% female) completed the version of the questionnaire that included the SDO and RWA measures. Their ages ranged from 16 to 51 ($M = 20.00$, $SD = 5.01$), with 56% explicitly identifying as New Zealand European and 3% as Māori.

Measures

Shortened SDO scale. Six items were randomly sampled from the original SDO scale so as to have an equal number of dominance items (e.g., "Inferior groups should stay in their place") and equality items (e.g., "All groups should be given an equal chance in life"). The specific SDO items used in this study were Items 3, 5, 7, 9, 11, and 15 (see Pratto et al., 1994, Appendix C). Participants indicated their agreement using a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), and scale score was computed by averaging over items after reverse coding relevant items (α = .71).

Shortened RWA scale. Six items were randomly sampled from the RWA scale (Altemeyer, 1981) so as to have an equal number of positively worded items (e.g., "Obedience and respect for authority are the most important virtues children should learn") and negatively worded items (e.g., "We should treat protestors and radicals with open arms and open minds, since new ideas are the lifeblood of progressive change"). Participants indicated their agreement using a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), and scale score was computed by reverse coding relevant items and averaging over items ($\alpha = .60$).

Environmental Attitudes Inventory. This consisted of 120 balanced items used by Milfont and Duckitt (2010, Study 1) to assess the higher order environmental attitude dimensions of preservation and utilization. Preservation attitudes express the general belief that priority should be given to preserving nature and the diversity of natural species, with items such as "Being out in nature is a great stress reducer for me"; "I think spending time in nature is boring" (reversed); "When humans interfere with nature, it often produces disastrous consequences"; and "I do not believe that the environment has been severely abused by humans" (reversed). Utilization expresses the general belief that it is right for nature and all natural phenomena to be exploited for human objectives, with items such as "The idea that natural areas should be maintained exactly as they are is silly, wasteful, and wrong"; "Turning new unused land over to cultivation and agricultural development should be stopped" (reversed); "Plants and animals exist primarily to be used by humans"; and "Humans are no more important than any other species" (reversed). Participants indicated their agreement using a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), and scale score was computed by averaging over items after reverse coding relevant items. Internal consistencies for preservation ($\alpha = .94$, 70 items) and utilization ($\alpha = .91$, 50 items) were adequate.

Results and Discussion

SDO and RWA were moderately positively correlated ($r = .36$, [.21, .49], $p < .001$, $n = 150$), and preservation and utilization attitudes were strongly negatively correlated ($r = -.67$, [$-.75$, $-.57$], $p < .001$, $n = 150$). Notably, SDO and RWA were positively correlated to utilization attitudes ($r_{SDO} = .27$, [.12, .41], $p = .001$, $n = 150$, and $r_{RWA} = .25$, [.09, .39], $p = .002$, $n = 150$), while negatively correlated to preservation attitudes ($r_{SDO} = -.21$, [$-.36$, $-.05$], $p = .01$, $n = 150$, and $r_{RWA} = -.17$, [$-.31$, $-.01$], $p = .04$, $n = 150$).

We then used two-step regressions to test whether SDO added incremental predictive validity beyond RWA. Preservation and utilization attitudes were regressed onto RWA as a first step, and then onto SDO as a second. SDO made a significant improvement to prediction when added to RWA: preservation attitudes (R^2 for RWA alone $= .03$; R^2_{change} adding SDO to RWA $= .03$, $p = .04$) and utilization attitudes (R^2 for RWA alone $= .06$; R^2_{change} adding SDO to RWA $= .04$, $p = .02$). Moreover, RWA was a significant negative predictor of preservation attitudes at Step 1 but a nonsignificant predictor after the addition of SDO (Step 1: $\beta_{RWA} = -.17$, $p = .042$; Step 2: $\beta_{RWA} = -.10$, $p = .24$; $\beta_{SDO} = -.18$, $p = .042$), and RWA was a significant positive predictor of utilization attitudes at Step 1 and remained a significant predictor, but with reduced effect, after the addition of SDO (Step 1: $\beta_{RWA} = .25$, $p = .002$; Step 2: $\beta_{RWA} = .18$, $p = .034$; $\beta_{SDO} = .20$, $p = .017$).

These findings show that SDO and RWA were positively associated with hierarchy-enhancing legitimizing myths justifying and supporting human dominance over nature (indexed by utilization attitudes), while negatively associated with a hierarchy-attenuating legitimizing myths justifying and supporting harmony with nature (indexed by preservation attitudes). The findings provide support for the usefulness of distinguishing between these two broad dimensions of environmental attitudes (Milfont & Duckitt, 2004, 2010), because they have different overall patterns of association with SDO and RWA. More importantly, the results suggest that SDO accounts for a statistically significant amount of additional variance over and above RWA in predicting environmental attitudes. In both cases, SDO made a significant improvement to prediction when added to RWA, and the variance accounted for by RWA was substantially reduced when SDO was controlled.

Study 4

This study replicates findings from Study 3 by examining whether SDO predicts environmentalism independently from RWA using a national New Zealand sample, and using a measure of beliefs about human influence on climate change. Furthermore, Study 4 examines whether SDO mediates the influence of gender on anthropogenic climate change beliefs. This is the first study to examine whether SDO mediates gender differences in environmentalism.

Method

Participants. Participants were respondents to an online survey (delivered via SurveyMonkey), solicited through the *Sunday Star Times*, a national New Zealand newspaper. The survey was promoted during September 2011, as an investigation of New Zealanders' political and social attitudes. The survey was open for a 2-week period, after which the data were collated and summarized for serialization in the newspaper. A total of 5,744 individuals responded to the survey, but after elimination of participants for missing data, 3,849 remained for use in this analysis. From these, 61% were female, 59% explicitly identified as New Zealand European, and 3% as Māori. The mean age was 50.71 years ($SD = 15.22$).

Measures. The survey included a range of measures relating to attitudes on topical social issues, and constructs related to sociopolitical attitudes. The summary below describes only those measures of interest in the present study.

Anthropogenic climate change. Beliefs about anthropogenic climate change were assessed using two items: "Climate change is caused by human actions" and "Climate change is a completely natural phenomenon, unrelated to anything humans do" (reversed). Participants indicated their agreement using a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). After reverse coding, so that higher scores indicate agreement with human influence on climate change, the two items intercorrelated strongly ($r = .78$, $p < .001$, $n = 3,849$) and were averaged together ($\alpha = .87$).

Shortened SDO and RWA scales. SDO was assessed with the same balanced set of six items used in Study 1 ($\alpha = .77$). RWA was measured using a balanced set of six items with highest loading based on factor analytic separation (Mavor, Louis, & Sibley, 2010) of the original RWA items into factors clearly assessing the three constellations of authoritarian submission (e.g., "Obedience and respect for authority are the most important virtues children should learn"), authoritarian aggression (e.g., "What our country really needs is a strong, determined leader who will crush evil, and take us back to our true path"), and conventionalism (e.g., "There is nothing wrong with premarital sexual intercourse"; reversed). For both scales, participants indicated their agreement using a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), and scale score was computed by averaging over items after reverse coding relevant items. Internal consistency for the RWA was also adequate ($\alpha = .71$).

Results and Discussion

In line with past studies, female participants ($M = 5.00$, $SD = 1.64$) showed greater endorsement of anthropogenic climate change than male participants ($M = 4.35$, $SD = 1.83$), $t(3,847) = 11.52$, $p < .001$, $d = .37$, and SDO and RWA correlated positively with each other ($r = .43$, [.40, .46], $p < .001$, $n = 3,849$). Importantly, SDO ($r = -.36$, [$-.39, -.33$], $p < .001$, $n = 3,849$) and RWA ($r = -.38$, [$-.41$, $-.35$], $p < .001$, $n = 3,849$) were negatively correlated with endorsement of anthropogenic climate change.

While endorsement of SDO and RWA is associated with lower levels of belief in a human cause of climate change, in a hierarchical regression SDO made a significant improvement to prediction when added to RWA (R^2 for RWA alone = .14; R^2_{change} adding SDO to RWA = .05, $p < .001$). The regression weight for RWA was also significantly reduced after the inclusion of SDO (Step 1: $\beta_{RWA} = -.38$, $p < .001$; Step 2: $\beta_{RWA} = -.27$, $p < .001$; $\beta_{SDO} = -.24$, $p < .001$). These results replicate findings from Study 3 and
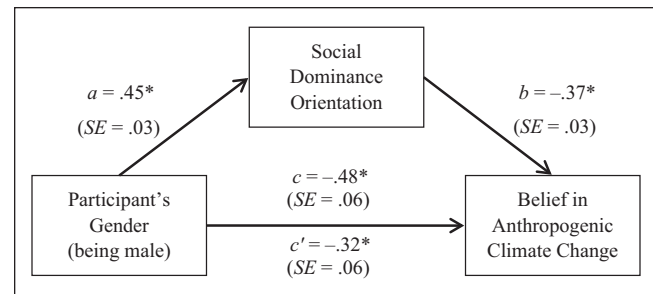

Figure 1. Results from Study 4 ($n = 3,849$).
Note. Mediation path model with 5,000 bootstrap resamples showing the influence of gender (coded 1 = female and 2 = male) on beliefs about anthropogenic climate change mediated by social dominance orientation (SDO). Standardized regression coefficients are shown. Values for *a* and *c* come from the simple regressions, and values for *b* and *c′* come from a multiple regression equation predicting anthropogenic climate change beliefs with participant's gender and SDO scores in the model. The model statistically adjusts for the effect of right-wing authoritarianism (RWA) on all variables. Asterisks indicate significant paths ($p < .0001$). SE = standard error.

provide further evidence that SDO is a unique predictor of environmentalism.

Finally, we examined the extent to which SDO mediated the gender difference in the endorsement of anthropogenic climate change when statistically adjusting for the effect of RWA. We tested this prediction using a path model with 5,000 bootstrap resamples. SDO mediated the relationship between gender (coded 1= female and 2 = male) and anthropogenic climate change beliefs (see Figure 1). The point estimate for the indirect effect was −.22, and the 95% CI [−.21, −.13] did not include zero, which indicates that SDO was a significant mediator. This is the first study reporting such findings and provides an indication that SDO accounts for some of the gender difference in environmentalism documented in the extant literature.

General Discussion

This article has expanded the theoretical scope of SDT to include human relations with the natural environment by arguing that SDO is an important variable in understanding person–environment relations. We argue that individuals high in SDO are more willing to exploit the environment in unsustainable ways because SDO supports human dominance over nature. From this perspective, environmental dominance represents the degree to which individuals desire and support human-based hierarchical views toward the environment and dominance of nature by humans. Three studies at the individual level of analysis and one study at the country level provided support for this environmental dominance perspective. The findings of the present research also offer additional empirical evidence for many already documented correlates of SDO (e.g., Kteily, Ho, & Sidanius, 2012; Pratto et al., 2006).

Implications of Environmental Dominance

The findings presented in this article show that support for a human-based hierarchical view toward nature is intrinsically linked to support for social inequality among social groups. As discussed earlier, the literature has identified legitimizing myths supporting and justifying human dominance over nature on one hand and legitimizing myths supporting and justifying harmony with nature on the other hand (e.g., Milfont & Duckitt, 2004). One important implication of our findings is that a theory addressing hierarchy in social relations, and a basic motivation to achieve and maintain hierarchical social structures (i.e., SDO), can also explain hierarchical relations between humans and the natural environment.

Despite the usefulness of models dealing with human–human interactions for understanding human–nature interactions, there are obvious differences in the level and scope of these interactions. Perhaps the most evident distinction is that social interactions are reciprocal, whereas human interactions with nature are arguably unidirectional (at least at short temporal intervals; significant changes in the environment may influence human beliefs and actions). In the context of SDT, for example, Sidanius and Pratto (1999) have demonstrated that social dominance is not only perpetuated by dominant groups but also by subordinate groups. Intergroup hierarchies in societies are maintained by reciprocal interactions between higher status and lower status groups.

In contrast, the hierarchical relations of humans toward the natural environment cannot be reciprocated by nature (as a nonsentient entity), which has important implications for dealing with environmental problems. While in the domain of social interactions legitimizing myths are likely fostered by multiple players in the interaction (dominant and subordinate groups), in the interactions with the natural environment hierarchy-enhancing and hierarchy-attenuating legitimizing myths can only be fostered by humans. Notwithstanding this crucial distinction, there is strong evidence suggesting that models of social interactions are useful for, and to some extent complement, models dealing with our interactions with nature.

Another important implication of our findings refers to the relationship between SDO and RWA. Together, SDO and RWA explain about 50% of variance in generalized prejudice (Altemeyer, 1998; McFarland & Adelson, 1996) and 50% to 66% of variance in conservative beliefs (Van Hiel & Mervielde, 2002; Wilson & Sibley, 2013), which shows that both constructs have strong explanatory power for important political phenomena. Although the combined explained variance in the environmental domain was comparably weaker, SDO and RWA were significant predictors. More importantly, while SDO and RWA have been shown to explain different segments of generalized prejudice (Duckitt, 2000, 2001), in the environmental domain SDO and RWA predicted responses to environmentally related questions equally when treated separately. However, when treated in combination, the effect of RWA is diminished after inclusion of SDO. This seems to support two distinct pathways in the interplay between SDO and RWA in the environmental domain. SDO and RWA typically interact in the context of specific functions within the group (i.e., leadership roles) so that Double Highs make decisions and display preferences that are ultimately worse for the environment (Altemeyer, 2003; Son Hing et al., 2007). Outside of these specific role relations, the effect of SDO on environmental exploitation seems to be stronger than the effect of RWA.

Additional studies are necessary to clarify the distinct influences of SDO and RWA in predicting environmentalism, but the stronger effect of SDO (compared with RWA) observed in the present research can perhaps be related to their respective patterns of associations with values. Previous studies have shown that SDO and RWA are related to the individual values proposed by Schwartz (1992). Overall, RWA relates more strongly than SDO to the higher order value dimension of conservation versus openness-to-change, while SDO relates more strongly than RWA to the higher order value dimension of self-enhancement versus self-transcendence values (Zick & Petzel, 1999). Other studies have also observed that the correlations between values forming the self-enhancement/self-transcendence cluster are much stronger for SDO than RWA (Altemeyer, 1998; Cohrs, Moschner, Maes, & Kielmann, 2005). This pattern of findings might partially explain why SDO is a stronger predictor of environmentalism compared with RWA. Many studies have shown that those who score high on self-transcendence values and low on self-enhancement values exhibit greater pro-environmental engagement (e.g., Boer & Fischer, in press; Milfont, Sibley, & Duckitt, 2010; Schultz et al., 2005; Schultz & Zelezny, 1999). Thus, self-enhancing values and SDO seem to underlie environmental dominance orientations.

Our findings also indicate a mediational role of SDO in the influence of gender on environmentalism. Replicating well-established findings (e.g., Dietz et al., 2002; Zelezny et al., 2000), we observed that women exhibited greater environmentalism than men—here measured by agreement with the proposition that humans influence climate change. But a large proportion of this observed gender difference resulted from gender differences in SDO (in which men score higher). Our study is the first to show that women might express greater environmentalism because they score lower in SDO. Because gender differences in environmentalism have also been associated with gender differences in altruistic values (Dietz et al., 2002), future research should explore the extent to which these gender differences result from women tending to score higher in altruistic values as well as lower on SDO.

Overcoming Environmental Dominance

One important question emerging from our findings is whether environmental dominance can be overcome.

Findings from a recent study illustrate this possibility. Feygina et al. (2010) linked SDO with the motivational tendency to defend and justify the societal status quo in the face of the threat posed by an environmental issue such as climate change. Feygina et al. observed that those high in system justification expressed greater denial of environmental issues and less commitment to pro-environmental engagement. This relationship may be explained by the proposition that "solutions to environmental problems often are viewed as threatening the existing social order, possibly requiring substantial changes in traditional values, habitual behaviours, and existing institutions" (Van Liere & Dunlap, 1980, p. 183). Thus, those with a tendency to support the status quo and to justify current socioeconomic systems and inequalities reject solutions to environmental problems. However, Feygina et al. observed that anti-environmentalism associated with a system justification tendency can be reversed by encouraging U.S. participants to deem pro-environmental actions as patriotic and consistent with *protecting* the status quo—an alternative view they refer to as "system-sanctioned change."

In a conceptually related study, Feinberg and Willer (2013, Study 3) were also able to increase environmental concern among conservative participants in the United States by presenting them with pro-environmental messages couched in terms of purity-based morality. In line with these findings, environmental sustainability can perhaps be fostered—at least to some extent—by translating myths that justify and support harmony with nature to be more aligned with specific morals connected to the current status quo of a particular cultural milieu (e.g., conserving native forests can generate jobs and economic growth by attracting more tourism).

Future Directions and Conclusion

One main limitation of this research is the correlational nature of the findings. Experimental and longitudinal designs should be preferred in future studies to elucidate environmental dominance orientation. For example, experimental studies could be designed in which priming social dominance should lead to environmental dominance, and vice versa. Another limitation is the reliance on New Zealand data. SDO has been shown to function differently in distinct cultural contexts (e.g., Ferreira, Fischer, Porto, Pilati, & Milfont, 2012; Henry, Sidanius, Levin, & Pratto, 2005), so its associations with environmentalism at the individual level of analysis should be explored across cultures in future studies.

The present research is the first to explicitly test whether a link exists between SDO and environmentalism, but this research provides no explanation as to *why* greater levels of SDO are associated with lower levels of environmentalism. We argued that human dominance over nature is an extension of SDO because both express similar basic motivations, such

that the motivational goals of group power, dominance, and superiority over others expressed by SDO translate into dominance/superiority over nature. It seems to us that anti-environmentalism is thus a side effect of the motivational goals SDO expresses.

According to Duckitt's (2001, 2006) dual-process model, the motivational goals expressed by SDO are likely generated by a combination of viewing the world as a "competitive jungle" and the predisposing personality dimension of tough-mindedness (or lack of empathy). Therefore, the motivations of dominance and superiority expressed by SDO are rooted in traits of being ruthless and unfeeling toward others, rather than being compassionate, caring, and altruistic toward others. In opposition to SDO, motivations of environmentalism are rooted in empathetic, tolerant, caring, and altruistic values and traits (Boer & Fischer, in press; Kaiser & Byrka, 2011; Milfont & Sibley, 2012). While concern for others is intertwined with concern for environmental issues, "concern for others is the form of empathy that precludes the desire to dominate other groups" indexed by SDO (Pratto et al., 1994, p. 752; see also McFarland, 2010; Sidanius et al., 2013). The opposition between the predisposing traits of SDO and environmentalism—in particular, empathy and altruism—might partially explain why the two are intrinsically, negatively related.

If we are to tackle environmental issues, then we must understand the underpinnings of ideologies and social attitudes that enhance hierarchical views toward nature as well as their effects on behaviors. The present research contributed to this undertaking by examining the association between the social attitude dimension of SDO and environmentalism. The findings indicate that SDO is a primary motivation underlying human interaction with the natural environment, and expands the extant literature by showing that SDO is not only an important variable in explaining how individuals approach intergroup relations but also how they relate to the natural environment. We believe further understanding of orientations supporting environmental dominance is an important avenue for future studies.

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