

**Opposition to immigration and (anti-)environmentalism: An application and extension of  
the social dominance-environmentalism nexus with 21 countries in Europe**

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Reference:

Graça, J. (2020). Opposition to immigration and (anti-)environmentalism: An application and extension of the social dominance-environmentalism nexus with 21 countries in Europe. *Applied Psychology*. <https://doi.org/10.1111/apps.12246>

## **Abstract**

The social dominance-environmentalism nexus proposes that orientations for inequality and domination are expressed both in human-human and human-nature relations. In two studies, the present work applies and extends this proposition to understand endorsement of environmental values, concern with climate change, support for climate policies, and responsibility for climate action. In study one, using a representative random sample from Portugal (N=1270, 53.3% female; European Social Survey, ESS8), social dominance orientation showed unique associations with concern with climate change. Moreover, opposition to immigration (as expression of anti-egalitarianism in intergroup relations) showed unique associations with all four measures of environmentalism. In study two, multi-level analyses using representative random samples from 20 other countries in Europe (N=38830, 51.5% female; ESS8) confirmed the associations between opposition to immigration and environmentalism, controlling for a set of sociodemographic covariates, political orientation, and nesting at the country level. However, there were differences in the strength and direction of these associations based on country levels of societal development (i.e., Human-Development-Index; HDI). These differences reinforce the notion that context or situational variables may shape the links between diverse expressions of (anti-)egalitarianism and (anti-)environmentalism. Inputs for applied research on hierarchy-affirming tendencies toward others and the natural environment are proposed and discussed.

**Keywords:** Social dominance orientation; opposition to immigration; climate change; climate action; environmental protection.

## **Introduction**

There is ever-increasing scientific consensus that ongoing and projected changes in Earth's geology and ecosystems will lead to critical consequences for human and non-human life in the planet (Lewis & Maslin, 2015; Rockström et al., 2009). Against this backdrop, there have been calls for more research that examines how to encourage accelerated and significant changes in behaviors, organizations and institutions to deliver effective mitigation and adaptation endeavors across the world (Pearson & Schuldt, 2018; Steg, 2018).

Applications from psychology may provide relevant contributions to address these calls and help understand the features that may drive or hinder these endeavors (Drenth, 2008; Van Langue et al., 2018) – which at the sociopsychological level may comprise a mixture of pursuit of self-interest (i.e., perceived gains and losses for the self) and concern for others (e.g., other individuals, groups, generations, species, or entire ecosystems) (Bamberg & Möser, 2007; Panno et al., 2018). This work applies and extends knowledge on the social psychological features that may hinder or sustain environmental protection, drawing on recent findings and propositions from the social dominance-environmentalism nexus.

### **Dominance orientations and (anti-)environmentalism**

Social dominance orientation (SDO) focuses on the degree to which individuals desire and support group-based hierarchy and the domination of “inferior” groups by “superior” groups (Pratto et al., 1994; Sidanius & Pratto, 2001) – and it has been proposed that this support for inequality and domination may extend from human-human to human-nature relations (Milfont et al., 2013). Conceptually speaking, according to this proposition, social dominance is reflected on instrumental views of others as to support the status quo of dominant groups with regard to disempowered groups, just as nature dominance is reflected on instrumental views of the natural environment as to support the status quo of

anthropocentric environmental exploitation (Milfont et al., 2013). Empirically speaking, a growing number of studies have indeed reinforced the notion that SDO relates with a set of environment-relevant outcomes, such as climate change denial, support for animal and environmental exploitation, and disregard for pro-environmental behaviors and environmental protection in general (Clarke et al., 2019; Dhont et al., 2014; Graça et al., 2018; Häkkinen & Akrami, 2014; Jackson et al., 2013; Jylhä & Akrami, 2015; Jylhä et al., 2016; Panno et al., 2018; Pratto et al., 1994; Milfont & Duckitt, 2010; Milfont & Sibley, 2014, 2016; Milfont et al., 2013, 2018; Stanley et al., 2017a, 2017b; Zhao et al., 2018). A recent meta-analysis by Stanley & Wilson (2019) has also concluded that SDO (along with Right Wing Authoritarianism; RWA) is consistently associated with multiple dimensions of environmentalism, such that individuals who tend to endorse hierarchical or authoritarian attitudes are also less likely to display pro-environmental attitudes and behaviors.

Some propositions have been advanced to explain the social dominance-environmentalism nexus. One idea is that SDO reflects a wide desire for superiority in which humans are entitled to dominate and exploit the natural environment, especially if this allows reasserting the power and status of dominant social groups (Jackson et al., 2013; Milfont et al., 2013). Likewise, it has been proposed that SDO is linked with the support for a status-quo in which there is unequal distribution of resources, and environmental exploitation allows for maintaining or widening the existing hierarchical social structures (Milfont & Sibley, 2014). Environmentalism can be seen as threatening an existing social system that preserves inequality and hierarchy in human-human and human-nature relations, which is arguably why individuals higher in SDO may react negatively to pro-environmentalism. Lending some support for this view, one recent study by Clarke and colleagues (2019) found that perceived threat to the status-quo (i.e., socio-economic system) mediated the links between SDO and several forms of climate change denial.

## **Extending the social dominance-environmentalism nexus**

Recent theoretical and empirical developments may be relevant for advancing knowledge on the social dominance-environmentalism nexus. One development is that the social dominance theory started to distinguish two dimensions more systematically within SDO (Ho et al., 2012; 2015). One dimension, SDO-Dominance (SDO-D), emphasizes an orientation for group-based dominance which maintains the subordination of low-status groups to high-status groups. The other dimension, SDO-Egalitarianism (SDO-E), asserts the support for intergroup inequalities and anti-egalitarian intergroup relations. Although SDO-D and SDO-E are strongly related with each other, recent findings in the environmental domain have shown that the SDO-E dimension is more strongly associated with environment-relevant variables than SDO-D (Clarke et al., 2019; Stanley et al. 2017). Likewise, Meleady and colleagues (2019) found that intergroup contact (with foreigners in one study and ethnic minorities in three studies) encouraged more environmentally responsible attitudes and behavior. Importantly, these effects of intergroup contact on environment-relevant variables were explained mostly by reductions in the SDO anti-egalitarian motive (SDO-E) (Meleady et al., 2019).

Taken together, these recent developments suggest that the anti-egalitarian aspect of SDO (i.e., rejecting the principle that all people deserve equal rights and opportunities) is a particularly relevant feature for the social dominance-environmentalism nexus. Building on these findings, we propose an extension to the social dominance-environmentalism nexus that includes opposition to immigration as direct expression of anti-egalitarianism in intergroup relations. Anti-immigration can be viewed as an expression of anti-egalitarianism to the extent that non-citizens are excepted from the principle of equal rights and opportunities (i.e., the right and opportunity to live and/or work in the destination country; Cole, 2012). Previous

research has shown that SDO predicts dehumanization and rejection of immigrants, as well as negative attitudes toward immigration (Costello & Hodson 2010, 2011; Guimond, Oliveira, Kamiesjki, & Sidanius, 2010; Thomsen, Green, & Sidanius, 2008). Importantly, some studies have also identified links between opposition to immigration and climate change skepticism, but the factors that explain these links remain unclear (Krange, Kaltenborn, & Hultman, 2019; Ojala, 2015). The present work proposes that these links can be viewed through the lens of the social dominance-environmentalism nexus. The rationale is that opposing immigration and rejecting environmentalism can both serve to uphold a hierarchical status quo in which empowered groups: (a) exclude disempowered groups (e.g., migrants; future generations) from the principle of equal rights and opportunities; and (b) exploit limited natural resources to meet their own immediate interests, often at the expense of the interests of disempowered groups (e.g., migrants; future generations). Framing opposition to immigration and anti-environmentalism within the social dominance-environmentalism nexus is particularly relevant also in light of concerns that climate change will aggravate global inequalities and shape migration trends in the future (Berchim et al., 2017; Cattaneo et al., 2019; Diffenbaugh & Burke, 2019).

### **The present work: Aim, objectives and hypotheses**

This work aims to apply and test an extension of the dominance-environmentalism nexus, to include opposition to immigration as a direct expression of anti-egalitarianism in intergroup relations. To address this aim, we will present two studies with two specific objectives.

In study one, the objective is to test if opposition to immigration (as expression of anti-egalitarianism) accounts for unique variance on environment-relevant variables, over and above a measure of SDO. To strengthen this contribution, the study will: (a) use a

representative sample with controlled data-collection procedures and probability-based sampling (European Social Survey, Round 8); and (b) account for a set of relevant and potentially confounding variables in the analyses (i.e., age, gender, education, income, political orientation). Based on the recent developments of the social dominance-environmentalism nexus presented above, we hypothesize that opposition to immigration (as direct expression of anti-egalitarianism) will account for unique variance on environment-relevant variables over and above a measure of SDO, and the sociodemographic and political orientation covariates. Furthermore, following Milfont et al. (2018), we will consider several environment-relevant variables to provide a stronger test for this hypothesis. The four variables that we will use reflect different levels of engagement with environmentalism, namely: endorsement of environmental values, concern with climate change, support for climate policies, and personal responsibility for climate action. Milfont et al. (2018) suggested that the strength of associations in the social dominance-environmentalism nexus may be greater with regard to direct/specific environmental measures. Thus, we will explore if the strength of the associations that we find here is similar or dissimilar across the four outcome variables.

In study two, the objective is to provide evidence on the robustness of the associations between anti-egalitarianism (measured as opposition to immigration) and environmentalism (measured as endorsement of environmental values, concern with climate change, support for climate policies, and responsibility for climate action). We will use a large set of representative samples from 20 additional countries in Europe, which also followed rigorous data-collection procedures and probability-based sampling (European Social Survey, Round 8). To reinforce this contribution, we will test if the strength of the associations between anti-egalitarianism and anti-environmentalism varies based on societal development at the country level. We will consider societal development as measured in the Human Development Index

(HDI), which ranks nearly 200 countries worldwide on an aggregate score based on life expectancy, education, and income (UNDP, 2016). This is relevant because Milfont and colleagues (2018) recently observed cross-level interaction effects of SDO and HDI on environmentalism with student samples from 25 countries (i.e., the SDO-environmentalism link was stronger in nations with better societal development indicators; cf. Milfont et al., 2018, Figure 1). Thus, in study two, we expect to observe unique associations of anti-egalitarianism with anti-environmentalism across the four outcome measures, accounting for a set of covariates (age, gender, education, income, and political orientation) and nesting at the country level (i.e., robustness hypothesis). In line with Milfont and colleagues (2018), we also anticipate that the strength of the associations between opposition to immigration and the outcome variables will be moderated by HDI, as contextual factor that varies across countries (i.e., moderation hypothesis).

### **Study one: Social dominance orientation, opposition to immigration, and (anti-) environmentalism**

#### **Method**

**Participants.** To test if opposition to immigration accounts for unique variance on environment-relevant variables over and above a measure of SDO and additional covariates, study one used data from the 8<sup>th</sup> round of the European Social Survey (ESS, Round 8)<sup>1</sup>. The ESS is a research infrastructure and biennial cross-national survey of attitudes and behavior established since 2001. An advantage of the ESS data is that besides using controlled data-collection procedures and strict probability-based samples, it provides design weights and

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<sup>1</sup> The ESS8 collected data on a set of themes from the core module (e.g., media and social trust; politics; socio demographics; human values) and two themes from the rotating modules (i.e., public attitudes to climate change; welfare). In addition to the core and rotating modules, each country can include a small set of measures to be collected in the fieldwork as country-specific data. In the 8<sup>th</sup> round, Portugal included a shortened SDO scale in the national questionnaire (see description in the measurement section).



adjusted post-stratification weights to reduce the sampling error and potential non-response bias. A random sample of 1270 individuals representative of the Portuguese population participated in the ESS8, aged between 15 and 93 years old ( $M=49.1$ ,  $SD=18.5$ ), 676 female participants (53.3%) and 594 male participants (46.7%). A minority of participants had completed no education ( $N=33$ , 2.6%), slightly more than half of the sample had completed up to basic education ( $N=741$ , 58.8%), and the remainder had completed up to secondary ( $N=259$ , 20.5%) or higher education ( $N=227$ , 18%). Detailed information on the ESS8 samples, data-collection procedures, and methodological documentation can be found online at the ESS website ([www.europeansocialsurvey.org](http://www.europeansocialsurvey.org)).

**Measures.** The measures that were used in this study are presented in full in the Supplementary Material and are also available online at the ESS website ([www.europeansocialsurvey.org](http://www.europeansocialsurvey.org)). *Sociodemographic variables and political orientation* included participants' gender, age, education, household income, and placement on left-right scale. *Social dominance orientation* was measured using a shortened 3-item version of the SDO scale (Pratto et al., 1994) as Country-Specific Data in the ESS8 Portugal (e.g., "It's probably a good thing that certain groups are at the top and other groups are at the bottom"). *Opposition to immigration* was measured as expression of anti-egalitarianism in intergroup relations, with three items taken from the ESS8 core module Politics (e.g., "To what extent do you think [country] should allow people of the same race or ethnic group as most of [country]'s people to come and live here?"). *Environmental values* were measured with a single value item from the Schwartz Value Survey (Schwartz, 1992) in the ESS8 core module Values (i.e. "He/she strongly believes that people should care for nature. Looking after the environment is important to him/her"). The other environment-relevant variables were measured with two items each, taken from the ESS8 rotating module Attitudes to Climate Change and Energy: *Concern with climate change* (e.g., "How worried are you about climate

change?”), *Support for climate policies* (e.g., “To what extent are you in favor or against the following policies in [country] to reduce climate change: Using public money to subsidize renewable energy such as wind and solar power”), and *Responsibility for climate action* (e.g., “To what extent do you feel a personal responsibility to try to reduce climate change?”). Full scale descriptions and reliability indices/inter-item correlations are detailed in the Supplementary Material (Full description of measures, pages 1 and 2 in Supp. Material).

**Data analysis.** In accordance with ESS guidelines for data analyses that use frequencies, percentages, summary statistics or model-based inferences, post-stratification weights were applied in all analyses to reduce the sampling error and potential non-response bias<sup>2</sup>. To address the main objective of this study, we used SPSS (v25) to test sequentially whether both social dominance orientation and opposition to immigration provided additional explanatory variance above and beyond the associations of sociodemographic variables and political orientation with environmental values, concern with climate change, support for climate policies, and responsibility for climate action. Specifically, four sets of hierarchical regressions were performed to examine the predictive ability of both social dominance orientation and opposition to immigration using environmental values, concern with climate change, support for climate policies, and responsibility for climate action as criterion variables. For each set of regression analyses, in Step 1 we entered the sociodemographic and political orientation variables, in Step 2 we entered social dominance orientation, and in Step 3 we entered opposition to immigration.

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<sup>2</sup> Post-stratification weights are constructed by adjusting the design weights in a way that replicates the distribution of the cross-classification of age group, gender, and education in the population and the marginal distribution for region in the population. Details on how the design and post-stratification weights are computed are available at the ESS website ([www.europeansocialsurvey.org](http://www.europeansocialsurvey.org))

## Results

Table 1 presents the descriptives and correlations in the Portuguese sample for political orientation, social dominance orientation, opposition to immigration, environmental values, concern with climate change, support for climate policies, and responsibility for climate action.

[TABLE 1]

As for the models, overall, incremental variances of social dominance orientation were significant in predicting concern with climate change and (marginally) support for climate policies over and above the other variables, but not in predicting environmental values and responsibility for climate action (see Table 2). As for opposition to immigration, incremental variances were significant in predicting scores for all the four environment related measures (i.e., environmental values, concern with climate change, support for climate policies, responsibility for climate action) over and above the other variables in the models, including social dominance orientation (Table 2).

[TABLE 2]

More specifically, with regard to environmental values, age, gender and political orientation were significant predictors in Model 1, SDO did not add incremental explanatory capacity in Model 2, but opposition to immigration added in Model 3 (Table 2). For concern with climate change, age, gender, education, and political orientation were significant predictors in Model 1, SDO added incremental explanatory capacity in Model 2, and opposition to immigration added as well when included in Model 3 (Table 2). With regard to support for climate policies, education and income levels were significant predictors in Model 1, SDO (marginally) added incremental explanatory capacity in Model 2, and opposition to immigration added as well when included in Model 3 (Table 2). Lastly, with regard to responsibility for climate action, gender and education were significant predictors in

Model 1, SDO did not add explained variance when added in Model 2, but opposition to immigration added explanatory capacity when added in Model 3 (Table 2).

Taking these findings as a whole (Table 2), opposition to immigration emerged as the most consistent unique predictor of environmental values, concern with climate change, support for climate policies, and responsibility for climate action. The strength of these associations was relatively similar across outcome measures, although slightly greater for support for climate policies and responsibility for climate action (which can both be seen as reflecting greater engagement with environmentalism). Education uniquely predicted three of four outcome variables, as did gender (albeit inconsistently in this sample). Age and political orientation uniquely predicted two outcome measures, and SDO and income uniquely predicted one of four outcome measures.

## **Study two: Robustness and consistency of the link between opposition to immigration and environmentalism**

### **Method**

**Participants.** To test the robustness and consistency of the associations between opposition to immigration and environment-relevant variables, study two used ESS8 nationally representative samples from 20 additional countries in Europe (N=38830; 51.5% female;  $M_{age}=47.5$ ). These countries were Austria (N=2010), Belgium (N=1766), Switzerland (N=1525), Czechia (N=2269), Germany (N=2852), Estonia (N=2019), Spain (N=1958), Finland (N=1925), France (N=2070), United Kingdom (N=1959), Hungary (N=1614), Ireland (N=2757), Iceland (N=880), Italy (N=2626), Lithuania (N=2122), Netherlands (N=1681), Norway (N=1545), Poland (N=1649), Sweden (N=1551), and Slovenia (N=1307). Detailed information on the ESS8 samples, data-collection procedures, and methodological documentation can be found online at the ESS website ([www.europeansocialsurvey.org](http://www.europeansocialsurvey.org)).

**Measures.** Study two included all the measures that were used in the first study (i.e., *age, gender, education, income, political orientation, opposition to immigration, environmental values, concern with climate change, support for climate policies, and responsibility for climate action*), with two changes. One change was that SDO was not included in this study because it was available only in the Portuguese sample as country-specific data. The other change was the addition of the *Human Development Index (HDI)* to measure societal development at the country level<sup>3</sup>. The values for each country's HDI were taken from the 2016 United Nations Human Development Report (UNDP, 2016; 'Table 1. Human Development Index and its components', which is included in the report's statistical annex). We used HDI values from the 2016 report because the ESS8 also took place in 2016. Detailed descriptions for the measures used in this study are presented in the Supplementary Material (Full description of measures, pages 1-2 in Supp. Material), as well as the mean values, standard deviations, and reliability indices/inter-item correlations for each country (Table S1, page 3 in Supp. Material).

**Data analysis.** As in study one, post-stratification weights were applied in all analyses to reduce the sampling error and potential non-response bias. A set of two-level models were computed to test if unique associations of opposition to immigration with anti-environmentalism were observable across the four outcome measures (environmental values, concern with climate change, support for climate policies, and responsibility for climate action), accounting for the other covariates (age, gender, education, income, and political orientation) and nesting at the country level. The mixed models were run in SPSS (v25) with restricted maximum likelihood estimation.

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<sup>3</sup> The HDI is computed based on indicators in three dimensions, namely life expectancy (life expectancy at birth), education (mean years and expected years of schooling), and Gross National Income (GNI) (GNI per capita, PPP \$). The HDI is the geometric mean of normalized indices for each of the three dimensions. Details and technical notes on how the index is computed can be found online at the United Nations Development Programme website (<http://hdr.undp.org/>).

## Results

Intraclass correlation coefficients (ICC) revealed that the proportion of variance associated with country membership was 3.91% for environmental values, 7.48% for concern with climate change, 5.65% for support for climate policies, and 8.22% for responsibility for climate action (Table 3). We examined if (and how) these country-level differences would affect the associations between opposition to immigration and anti-environmentalism, testing HDI as moderator variable in each multi-level model. In each model, the level-1 variables (i.e., opposition to immigration and the covariates age, gender, education, income, and political orientation) were added together with HDI as level-2 predictor, plus the interaction term for opposition to immigration and the moderator HDI. The intercepts of all variables and the slopes of opposition to immigration were allowed to vary across countries (Table 3). All predictor variables were centered before being entered in the analyses (group-mean centering for level-1 variables, grand-mean centering for the level-2 variable).

[TABLE 3]

[TABLE 4]

Overall, the results showed significant associations between the covariates age, gender, education and political orientation and the set of environment-relevant outcome variables considered in the present study (Table 4). More importantly, the results also confirmed that the measure of opposition to immigration (as expression of anti-egalitarianism) showed unique, significant and negative associations with environmental values ( $y = -.105$ ,  $t = -6.48$ ,  $p < .001$ ), concern with climate change ( $y = -.120$ ,  $t = -6.10$ ,  $p < .001$ ), support for climate policies ( $y = -.217$ ,  $t = -14.07$ ,  $p < .001$ ), and responsibility for climate action ( $y = -.345$ ,  $t = -7.76$ ,  $p < .001$ ) (Table 4). As for the moderating role of HDI, the findings indicated that the associations between opposition to immigration and the measures of

environmentalism did vary according to HDI (Table 4). Cross-national differences in terms of societal development (HDI) significantly affected the associations between opposition to immigration and environmental values ( $y=-2.353$ ,  $t=-4.21$ ,  $p<.001$ ), concern with climate change ( $y=-1.806$ ,  $t=-2.69$ ,  $p<.05$ ), support for climate policies ( $y=-2.274$ ,  $t=-4.31$ ,  $p<.001$ ), and responsibility for climate action ( $y=-5.063$ ,  $t=-3.34$ ,  $p<.01$ ).

[FIGURE 1]

We used ModGraph for continuous moderators to plot the interaction graphs for each outcome variable, and test whether the slopes of HDI (i.e., *low*, *med*, and *high* levels of HDI; SD below/above the mean) differed significantly from zero (Jose, 2013). The results were similar and followed the same pattern for all outcome variables, thus we present one figure in the main text to visually illustrate the findings (Figure 1, responsibility for climate action). The figures with visual illustrations for all variables are presented in Supplementary Material (Figures S1.A to S1.D, page 8 in Supp. Material), and the findings are reported both here in text and in Supplementary Material. At *higher* and *mid*-levels of HDI, increased opposition to immigration (as expression of anti-egalitarianism) was associated with lower environmental values (high HDI:  $y=-.82$ ,  $SE=.17$ ,  $t=-4.84$ ,  $p<.001$ ; mid HDI:  $y=-.11$ ,  $SE=.02$ ,  $t=-6.35$ ,  $p<.001$ ), lower concern with climate change (high HDI:  $y=-.67$ ,  $SE=.20$ ,  $t=-3.28$ ,  $p<.001$ ; mid HDI:  $y=-.12$ ,  $SE=.02$ ,  $t=-6.00$ ,  $p<.001$ ), decreased support for climate policies (high HDI:  $y=-.90$ ,  $SE=.16$ ,  $t=-5.66$ ,  $p<.001$ ; mid HDI:  $y=-.22$ ,  $SE=.01$ ,  $t=-15.34$ ,  $p<.001$ ), and decreased responsibility for climate action (high HDI:  $y=-1.86$ ,  $SE=.46$ ,  $t=-4.08$ ,  $p<.001$ ; mid HDI:  $y=-.35$ ,  $SE=.04$ ,  $t=-7.71$ ,  $p<.001$ ). These associations were consistent in all outcome variables, and were stronger (steeper slopes) at *higher* levels of HDI than at *mid*-levels (Figure 1; Figures S1.A to S1.D, page 8 in Supp. Material). However, and surprisingly, the direction of the associations between opposition to immigration and each outcome variable was reversed at *lower* levels of HDI. This means that at *lower* levels of HDI, higher opposition to

immigration (as expression of anti-egalitarianism) was associated with higher environmental values ( $y=.60$ ,  $SE=.17$ ,  $t=3.53$ ,  $p<.001$ ), greater concern with climate change ( $y=.42$ ,  $SE=.20$ ,  $t=2.08$ ,  $p<.05$ ), higher support for climate policies ( $y=.47$ ,  $SE=.16$ ,  $t=2.93$ ,  $p<.01$ ), and higher responsibility for climate action ( $y=1.17$ ,  $SE=.46$ ,  $t=2.57$ ,  $p<.01$ ). The slopes were significantly different from zero on the three levels of HDI (high, mid, low) on all outcome variables.

## Discussion

Drawing on the link between social dominance orientation and environmentalism (Milfont et al., 2013, 2018), this work increased knowledge on social psychological features relevant for the endorsement of environmental values, concern with climate change, support for climate policies, and responsibility for climate action. In study one, we applied and tested a novel extension of the social dominance-environmentalism nexus, which includes opposition to immigration as a specific expression of anti-egalitarianism in intergroup relations. In study two, we examined the robustness of the associations between opposition to immigration and (anti-)environmentalism with a set of representative samples from 20 countries in Europe. The studies offered two main contributions, which are described and discussed below, together with implications for future research.

### **Extending the dominance-environmentalism nexus to include a specific expression of anti-egalitarianism**

Recent theoretical and empirical developments have emphasized the role of inequality in intergroup relations as an important feature of the social dominance-environmentalism nexus (Clarke et al., 2019; Meleady et al., 2019; Stanley et al. 2017). Drawing on these developments, the first main contribution of the present work was to apply and extend the



dominance-environmentalism nexus, including opposition to immigration as expression of anti-egalitarianism. In a nationally representative sample drawn from the European Social Survey (Portugal; ESS8), a shortened measure of social dominance orientation showed significant correlations with three measures of environmentalism (i.e., concern with climate change, support for climate policies, and responsibility for climate action) and accounted for unique variance in concern with climate change. Additionally, opposition to immigration accounted for unique variance in the four measures of environmentalism (i.e., environmental values, concern with climate change, support for climate policies, and responsibility for climate action) over and above demographic variables, political orientation, and social dominance orientation.

This means that opposition to immigration (as expression of anti-egalitarianism) appeared in study one as an overall relevant and reliable feature for environmentalism, and was the most consistent unique predictor of the four outcome variables. This is consistent with the view that opposing immigration and rejecting environmentalism can both serve to maintain hierarchical social structures in which empowered groups: (a) exclude disempowered groups (e.g., migrants; future generations) from the principle of equal rights and opportunities, and (b) exploit limited natural resources to meet their own immediate interests, often at the expense of the interests of disempowered groups (e.g., migrants; future generations). Further research is needed to support or refute this proposition. Similarly, the present findings are also meaningful in light of the cognitive liberalization hypothesis, which frames intergroup contact as a liberalizing agent on human cognition and experience (Hodson et al., 2018). According to this hypothesis, contact with outgroup members (such as foreigners and people from ethnic minorities) can reduce ideological views about social hierarchy and also impact a range of more expansive variables, which include environmental attitudes and behavior (Meleady et al., 2019).

In the present study, it is noteworthy that extending the dominance-environment nexus to include a direct and specific expression of anti-egalitarianism yielded stronger and more reliable results on the four measures of environmentalism, comparing to SDO. One explanation for these findings could be that the shortened measure of SDO used with the ESS8 Portuguese sample only included three items, which referred to the dominance component of SDO. Thus, it is plausible that using a recent and established measure of SDO (SDO-D and SDO-E; Ho et al., 2012, 2015) would yield more reliable associations with the outcome variables (see Clarke et al., 2019; Stanley et al. 2017). A complementary explanation for these findings is that perhaps dominance motives *per se* do not lead to anti-environmentalism, but may be connected to an underlying sense of entitlement and self-interest at the expense of others, which feeds into anti-egalitarian motives and manifestations and can have both environmental and social (intergroup) consequences. This resonates with the wider notion that self-serving exploitative tendencies toward others (i.e., humans, non-humans, and the natural environment) may have shared psychological underpinnings (Dhont et al., 2016; Graça et al., 2018; Milfont & Sibley, 2016). Further studies on the social dominance-environmentalism nexus are warranted, which consider direct and specific expressions of inequality and discrimination in self-other relations (e.g., racism, see Richeson & Sommers, 2016; speciesism, see Caviola, Everett, & Faber, 2019), together with recent and established measures of SDO (SDO-D and SDO-E; Ho et al., 2012, 2015).

### **Robustness and consistency of the link between opposition to immigration and anti-environmentalism**

Recent theoretical and empirical developments have emphasized the need for placing psychological phenomena in the larger societal contexts in which they occur (Pettigrew, 2018). In this regard, Milfont and colleagues (2018) observed that the strength of the

associations between SDO and environmentalism varied in student samples from 25 countries, based on country levels of societal development. Drawing on these developments, in study two we tested the robustness of the associations between opposition to immigration (as expression of anti-egalitarianism) and anti-environmentalism, with representative samples from 20 countries in Europe that took part in the European Social Survey (Round 8, ESS8). Furthermore, following the work of Milfont and colleagues (2018), we examined if these associations varied based on an indicator of societal development at the country level (i.e., Human Development Index, HDI). The results for the main effects confirmed unique significant associations of opposition to immigration with environmental values, concern with climate change, support for climate policies, and responsibility for climate action, accounting for the sociodemographic covariates, political orientation, and nesting at the country level. However, cross-level interactions and simple slope analyses showed relevant differences in the strength and direction of these associations, based on the levels of societal development. Drawing on previous findings (Milfont et al., 2018), we had anticipated that only the strength of the associations would vary based on HDI as context (level-2) variable. The current findings challenged these expectations, and instead suggested that not only the strength but also the direction of these associations may vary depending on contextual features.

In the present study, contexts with (comparatively) high and mid-levels of societal development showed the expected pattern of associations. In these contexts, increased opposition to immigration was related with decreased endorsement of environmental values, lower concern with climate change, lower support for climate policies, and lower responsibility for climate action (Figure 1). However, surprisingly, contexts in which the levels of societal development were (comparatively) lower showed a pattern of associations in the opposite direction, and the pattern was consistent across the four outcome variables. In

these contexts, increased opposition to immigration was linked with increased endorsement of environmental values, higher concern with climate change, higher support for climate policies, and higher responsibility for climate action (Figure 1).

Milfont and Sibley's (2014) Hierarchy Enforcement Hypothesis of Environmental Exploitation may offer insights to help interpret these findings. The Hierarchy Enforcement Hypothesis proposes that social dominance orientation predicts willingness to exploit the environment, but only to the extent that the resources gained from exploiting the environment benefit already high-status groups in society (Milfont & Sibley, 2014). A similar and tentative analogy can be made considering socio-structural variables at the country level. Perhaps in contexts that are (comparatively) more developed, the links between anti-egalitarianism and anti-environmentalism exist to the extent that exploiting the environment (and opposing immigration) is beneficial to reinforce an already dominant position. In turn, in contexts that are (comparatively) more deprived, perhaps the way to assert dominance and inequality (in this case) would be to defend closing the borders to outsiders, and reassert control over the local natural resources and the local environment following an almost 'neo-Malthusian' orientation. 'Neo-Malthusians' argue that limits to growth and prosperity may trigger a chain of occurrences which heighten risks for conflicts between/within states but also communities – including between natives and non-natives –, especially in more deprived contexts (Bernauer, Böhmelt, & Koubi, 2012; Daly, 2006; Homer-Dixon, 1999). Thus, in a societal frame in which the scarcity of resources is (comparatively) more salient, rejecting immigrants while taking better care of the available resources could arguably serve as a hierarchy enforcement mechanism, to the extent that this widens the gap between high-status and low-status groups – in this case between natives and immigrants, respectively. We also cannot exclude the possibility that these findings may be reflecting particular cultural and/or geopolitical features specific to the European context (which may co-occur with country-

levels of HDI), and not necessarily differences in the levels of societal development *per se*. In any case, the cross-level interaction results clearly and consistently suggest that the observed associations are contingent upon context. Thus, the results call for further research that examines the cultural, structural and sociopsychological underpinnings of the links between (anti-)egalitarianism and (anti-)environmentalism.

### **Limitations and additional future directions**

In addition to considering the inputs for further research advanced in the present work, future studies could also seek to address some of its main limitations. One important limitation is that we used single to three-item shortened measures that were available from the European Social Survey (Round 8, ESS8). There is evidence to support the cross-cultural validity of the ESS immigration scales (Davidov, Cieciuch, & Schmidt, 2018; Meuleman & Billiet, 2012), but the ESS8 dataset did not include complete versions of well-established measures of social dominance orientation, environmental values, concern with climate change, support for climate policies, and responsibility for climate action, to address the aims of the present study. On the one hand, measurement shortcomings may have accounted for some results that were not easy to explain (e.g., environmental values correlated weakly with the other environment-relevant variables; the measure of support for climate policies yielded overall low inter-item correlations). On the other hand, the sampling and data collection procedures of the ESS8 are very robust, the samples are large and representative of each nation, and the overall pattern of results (both in the main effects and in the cross-level interaction effects) was remarkably consistent across the four outcome variables. This suggests that the present findings merit attention. Moreover, many of the previous studies that informed the present work also used shortened measures to address key constructs on the topic such as social dominance orientation and environment-relevant variables (e.g., Jylhä et

al., 2016; Milfont & Duckitt, 2010; Milfont & Sibley, 2016; Milfont et al., 2013; Stanley et al., 2017a, 2017b). This strengthens confidence in our findings when discussed within the overall body of evidence on the social dominance-environmentalism nexus. Nevertheless, to address these limitations, one priority for future studies is to use complete versions of established and relevant measures whenever possible, and assess the cross-cultural validity of these measures whenever comparing data across cultural groups (Fischer & Karl, 2019). Causal and longitudinal relationships should also be tested in future research (e.g., using cross-lagged panel models), as this study only used cross-sectional data.

## **Conclusion**

The present work advanced and tested a novel extension of the social dominance-environmentalism nexus, to include opposition to immigration as a specific expression of anti-egalitarianism in intergroup relations. The results confirmed that opposition to immigration accounted for unique variance in endorsement of environmental values, concern with climate change, support for climate policies, and responsibility for climate action, over and above a set of relevant covariates. This lends support to the view that how we relate to others may, to some extent, be mirrored in how we relate to the environment – and vice-versa. We also observed relevant differences in the strength and direction of the associations between opposition to immigration and environmentalism, based on country levels of societal development (i.e., Human Development Index, HDI). These cross-level interactions suggest that the social dominance-environmentalism nexus may take on different forms depending on contextual variables. This reinforces previous calls for placing psychological processes within the larger societal contexts in which they occur. A tentative interpretation of these findings was proposed drawing on the Hierarchy Enforcement Hypothesis of Environmental Exploitation (Milfont & Sibley, 2014). However, further research is warranted to understand

how (and why) context or situational variables may shape the links between diverse expressions of (anti-)egalitarianism and (anti-)environmentalism.

### **Acknowledgements**

The author would like to thank two anonymous reviewers for their inputs that helped improve this article. The author is supported by a grant from the Portuguese Foundation for Science and Technology (SFRH/BPD/115110/2016).

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Table 1. Descriptive statistics and correlations among measures in a representative random sample of the Portuguese population.

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Political orientation <sup>a</sup>	4.64	2.48	—					
2. Social dominance orientation <sup>b</sup>	2.50	.77	.04	—				
3. Opposition to immigration <sup>c</sup>	2.20	.67	.08**	.27***	—			
4. Environmental values <sup>d</sup>	4.79	.96	-.10**	-.05	-.09**	—		
5. Concern with climate change <sup>e</sup>	3.47	.89	-.07*	-.22***	-.21***	.21***	—	
6. Support for climate policies <sup>f</sup>	3.11	1.04	.02	-.12***	-.24***	.11***	.33***	—
7. Responsibility for climate action <sup>g</sup>	5.10	2.55	-.02	-.11***	-.22***	.09**	.34***	.30***

Notes: *a*: 00-left to 10-right; *b*: 1- completely disagree to 5- completely agree; *c*: 1-allow many to 4-allow none; *d*: 1-not like me at all to 6- very much like me; *e*: 1-not at all to 5-extremely/a great deal; *f*: 1-strongly against to 5-strongly in favour; *g*: 00-not at all to 10-extremely/a great deal. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 2. Predictive ability of sociodemographic variables, political orientation, social dominance orientation, and opposition to immigration (as display of anti-egalitarianism) on environmental values, concern with climate change, support for climate policies, and responsibility for climate action.

Variables	<i>Environmental values</i>				<i>Concern with climate change</i>				<i>Support for climate policies</i>				<i>Responsibility for climate action</i>			
	$\beta$	$\Delta R^2$	$\Delta F$	$\Delta dfs$	$\beta$	$\Delta R^2$	$\Delta F$	$\Delta dfs$	$\beta$	$\Delta R^2$	$\Delta F$	$\Delta dfs$	$\beta$	$\Delta R^2$	$\Delta F$	$\Delta dfs$
Model 1		.03***	5.25	5, 991		.12***	27.12	5, 984		.10***	22.15	5, 989		.05***	10.17	5, 977
Age	.11**				.12**				.02				-.06			
Gender	.08*				-.10**				-.05				-.09**			
Education	.06				.39***				.27***				.17***			
Income	-.01				-.03				.10**				-.02			
Political orientation	-.10**				-.09**				.01				-.01			
Model 2		.00	.00	1, 990		.02***	26.88	1, 983		.00 <sup>†</sup>	3.76	1, 988		.00	.07	1, 976
Age	.11**				.11**				.02				-.06			
Gender	.08*				-.10**				-.04				-.09**			
Education	.06				.34***				.25***				.17***			
Income	-.01				-.03				.10**				-.02			
Political orientation	-.10**				-.08**				.01				-.01			
SDO	.00				-.16***				-.06 <sup>†</sup>				-.01			
Model 3		.01*	7.67	1, 989		.01*	6.16	1, 982		.01***	12.81	1, 987		.01***	13.99	1, 975
Age	.11**				.11**				.02				-.06			
Gender	.08*				-.09**				-.04				-.08**			
Education	.04				.31***				.22***				.14**			
Income	-.01				-.03				.10**				-.02			
Political orientation	-.09**				-.07*				.02				.00			
SDO	.02				-.14***				-.04				-.02			
Opposition to immigration	-.09**				-.08*				-.12***				-.13***			

Notes: <sup>†</sup>  $p < .06$  \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

Table 3. Variance at level-2 (estimates of covariance parameters) for each outcome variable.

	Null models			Multilevel models		
	<i>Estimate</i>	<i>SE</i>	<i>Wald Z</i>	<i>Estimate</i>	<i>SE</i>	<i>Wald Z</i>
Environmental values						
Residual	1.061***	.01	132.23	.964***	.01	117.80
Intercept	.036**	.01	2.87	.046**	.02	2.94
Opposition to immigration	—	—	—	.004*	.00	2.01
Concern with climate change						
Residual	.697***	.01	131.72	.612***	.01	117.39
Intercept	.056**	.02	2.90	.038**	.01	2.96
Opposition to immigration	—	—	—	.007**	.00	2.65
Support for climate policies						
Residual	.789***	.01	131.80	.686***	.01	117.91
Intercept	.049**	.02	2.89	.037**	.01	2.93
Opposition to immigration	—	—	—	.004*	.00	2.42
Responsibility for climate action						
Residual	4.515***	.03	130.95	4.199***	.04	117.06
Intercept	.396**	.14	2.90	.274**	.14	2.96
Opposition to immigration	—	—	—	.032*	.01	2.51

Notes: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$



Table 4. Estimates of fixed effects for the outcome variables environmental values, concern with climate change, support for climate policies, and responsibility for climate action, with Human Development Index (HDI) as level-2 predictor ( $N_{\text{countries}}=20$ ).

Variables	Environmental values ( $N_{\text{participants}}=27800$ )			Concern with climate change ( $N_{\text{participants}}=27605$ )			Support for climate policies ( $N_{\text{participants}}=27851$ )			Responsibility for climate action ( $N_{\text{participants}}=27452$ )		
	Estimate	SE	t	Estimate	SE	t	Estimate	SE	t	Estimate	SE	t
Intercept	4.824***	.05	99.18	3.064***	.04	69.62	3.418***	.04	79.19	5.051***	.12	18.06
Age	.010***	.00	29.69	-.001 <sup>†</sup>	.00	-1.83	-.001***	.00	-4.77	-.002**	.00	-3.01
Gender	.075***	.01	6.31	.059***	.01	6.25	.055***	.01	5.54	.263***	.02	10.54
Education	.016***	.00	9.11	.033***	.00	23.23	.020***	.00	13.29	.027***	.00	7.31
Income	-.001	.00	-.48	.010***	.00	5.26	.020***	.00	9.78	.046***	.01	9.11
Political orientation	-.024***	.00	-8.32	-.034***	.00	-14.90	-.034***	.00	-14.17	-.004	.01	-.64
HDI	-2.769	1.66	-1.67	2.83 <sup>†</sup>	1.50	1.89	1.383	1.47	.94	9.301*	4.02	2.31
Opposition to immigr.	-.105***	.02	-6.48	-.120***	.02	-6.10	-.217***	.02	-14.07	-.345***	.04	-7.76
HDI x Opp. to immigr.	-2.353***	.56	-4.21	-1.806*	.67	-2.69	-2.274***	.53	-4.31	-5.063**	1.52	-3.34

Notes: All predictor variables are centered. <sup>†</sup>  $p < .10$  \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

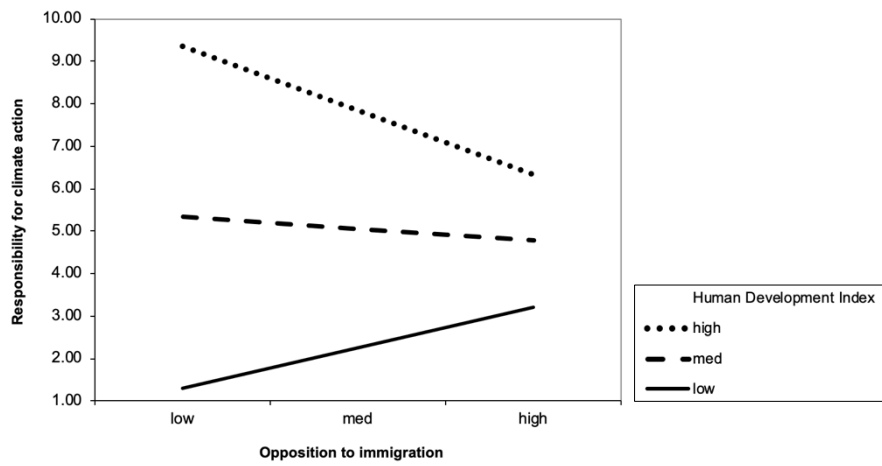


Figure 1. Plot of interaction effect of opposition to immigration (as display of anti-egalitarianism) and HDI on responsibility for climate action (high HDI:  $y=-1.86$ ,  $SE=.46$ ,  $t=-4.08$ ,  $p<.001$ ; mid HDI:  $y=-.35$ ,  $SE=.04$ ,  $t=-7.71$ ,  $p<.001$ ; low HDI:  $y=1.17$ ,  $SE=.46$ ,  $t=2.57$ ,  $p<.01$ ).