Short Communication

Empathic and social dominance orientations help explain gender differences in environmentalism: A one-year Bayesian mediation analysis ☆

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ABSTRACT

Women tend to display greater pro-environmental attitudes and behaviour than men. This gender difference in environmentalism has been explained in terms of distinct gender role socialization, with women socialized to be more other-focused and empathic compared to men. A related explanation is that women are more environmentally concerned because they are less prone to favour social dominance than men, which is in line with recent research showing that empathy and social dominance orientation (SDO) are intrinsically linked. We tested a Bayesian path model examining the extent to which empathy and SDO predicted environmental values over a one-year period, and the extent to which such effects mediated the initial gender difference. Results from a national probability adult sample (N = 4381) indicated that both empathy and SDO partially and independently mediated the gender–environmentalism link. Women tended to display higher levels of environmental values because they were higher in empathy and lower in SDO, while men displayed lower levels of environmental values because they were lower in empathy and higher in SDO. The findings have theoretical implications for the reciprocal relations between empathy and SDO, and practical implications for understanding and fostering pro-environmental engagement across distinct social actors.

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1. Introduction

A number of studies have investigated the relations between socio-demographic factors and pro-environmental attitudes and behaviour (for reviews, see Fransson & Gärling, 1999; Van Liere & Dunlap, 1980). In particular, past research has identified a small but fairly consistent gender difference in environmentalism with women tending to express greater environmental concern and pro-environmental engagement compared to men (e.g., Frazin & Vogl, 2013;Stern, Dietz, & Guagnano, 1995; Zelezny, Chua, & Aldrich, 2000). To illustrate, in their meta-analysis and original data Zelezny et al. (2000) confirmed this gender difference in pro-environmental attitudes and behaviour across age groups and countries.

Gender-socialization and gender-role theories are often used to explain the observed gender differences in environmentalism (Dietz, Kalof, & Stern, 2002; Zelezny et al., 2000; Xiao & McCright, 2015). Compared to men, women tend to be socialized to empathize with the needs and welfare of other people and also to be more interdependent and co-operative. The argument is that this greater empathic concern acquired by women during socialization and gender role expectations and experiences give rise to a stronger empathic concern regarding other animals and the natural environment. Formally, this suggests that empathy mediates the observed gender difference in environmentalism. Arnocky and Stroink (2011) tested the mediation role of empathy on the gender–environmentalism link in an undergraduate Canadian sample. Their findings showed that emotional empathy indeed helped explain the observed gender differences on environmentalism.

Other mediators of the association between gender and environmentalism have been proposed (Milfont, Richter, Sibley, Wilson, & Fischer, 2013; Xiao & McCright, 2015). One alternative mediator has particular theoretical importance because of its associations with empathic concern, which (as noted above) has been shown to help explain the gender–environmentalism link. This alternative mediator is social dominance orientation (SDO), or "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). Research has shown that individuals who report high levels of SDO tend to be less concerned about environmental issues (e.g., Dhont, Hodson, Costello, & MacInnis, 2014; Jylhä & Akrami, 2015; Milfont et al., 2013; Milfont & Sibley, 2014). Importantly, SDO has been shown to be intrinsically related to empathy (Duckitt & Sibley, 2010; Sidanius et al., 2013), and to mediate gender differences on belief in anthropocentric climate change (Milfont et al., 2013, Study 4).

So far empirical studies have provided evidence for the mediation role of both empathy (Arnocky & Stroink, 2011) and SDO (Milfont et al., 2013, Study 4) on the effect of gender on environmentalism. However, to our knowledge no previous study has attempted to examine whether both empathy and SDO would mediate the gender–environmentalism link. The extant theorizing and empirical findings suggest that women might display greater levels of environmentalism as a result of both *higher* levels of empathy and *lower* levels of SDO compare to men. The present study tests this novel double mediation using a Bayesian path model of one-year panel data.

2. Method

2.1. Participants

The analyses reported here are based on data from the New Zealand Attitudes and Values Survey (NZAVS), a national panel study that has been assessing people's socio-political attitudes annually since 2009.[1] Participants were 4421 people for whom matched data were available for the NZAVS in 2009 and 2010 (retention = 68% of 2009 sample). The sample consisted of 1698 men and 2723 women with a mean age in 2009 of 49.90 (SD = 15.24) and a mean household income of $84,182 (SD = $70,172). In terms of ethnicity, 3762 were New Zealand European, 681 were Māori, 160 were Pacific Nations and 179 were Asian peoples (note that these categories were not mutually exclusive). Our analyses allowed for missing data for endogenous measures, which was minimal with covariance coverage ranging from .98 to .99.

2.2. Measures

Empathy (M = 5.25, SD = 1.02; α = .59) was measured using three items from the compassion facet of Agreeableness developed by DeYoung, Quilty, and Peterson (2007). These items were 'Sympathize with others' feelings', 'Am not interested in other people's problems' (reversed), and 'Feel others' emotions'. SDO (M = 2.59, SD = .96; α = .70) was measured using six balanced items from Sidanius and Pratto (1999). Example items were: 'To get ahead in life, it is sometimes okay to step on other groups' and 'We should have increased social equality' (reversed). Items were rated on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), and scale scores were computed by averaging over items after after reverse coding relevant items.

Environmentalism was measured using a single environmental value item from the Schwartz Value Survey (Schwartz, 1992). Participants rated the importance of "Protecting the environment (preserving nature)" 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 mean for this item in 2009 was 5.22 (SD = 1.51) and 5.08 (SD = 1.53) in 2010.

2.3. Bayesian modelling

We tested our predictions using a lagged path model with Bayesian estimation (for a review, see Kruschke, Aguinis, & Joo, 2012). The Bayesian regression slopes (and lagged and indirect effects) tested in our model are conceptually similar to more well-known frequentist mediation models estimated using Maximum Likelihood. However, the use of Bayesian estimates is arguably more robust and interpretable. Credible intervals in Bayesian analysis use the specific percentile values around the distribution of each parameter—known as the posterior distribution. For example, the 95% Bayesian Credible Intervals for the posterior

distribution of a regression slope, such as those we estimate here, would take the 2.5 and 97.5 percentile values of the posterior distribution, thus allowing for skew. This is important in tests of indirect effects, which are known to be skewed (see Yuan & MacKinnon, 2009). The *p*-values we report in our analyses thus reflect the proportion of the posterior distribution for a given parameter (regression slope or indirect effect) that is above or below zero. Our model used non-informative priors, and was estimated in Mplus 7.3.[2]

3. Results

We tested a path model in which gender (0 women, 1 men) predicted Time 1 levels of empathy, SDO and environmental values. We in turn modelled Time 1 empathy, SDO and environmental values as joint predictors of Time 2 environmental values. We also modelled the residual associations between Time 1 empathy, SDO and environmental values, hence statistically adjusting for their shared residual variance when predicting Time 2 environmental values. This model therefore tested the lagged effect of Time 1 empathy and SDO on Time 2 environmental values measured the following year when adjusting for Time 1 environmental values (see Fig. 1).

Our model indicated that men were significantly lower in empathy (β = −.292, *p* < .001, *b* = −.613, post. SD = .030, 95% CI = −.672, −.554) and higher in SDO (β = .189, *p* < .001, *b* = .374, post. SD = .029, 95% CI = .317, .431) relative to women. The hypothesised lagged effects of empathy and SDO were also both significant. Time 1 empathy predicted Time 2 environmental values (β = .038, *p* = .001, *b* = .057, post. SD = .019, 95% CI = .020, .094). Empathy thus predicted residualized change in environmental values independent of SDO. Likewise, Time 1 SDO predicted residualized change in environmental values over time independent of empathy (β = −.032, *p* = .007, *b* = −.050, post. SD = .020, 95% CI = −.090, −.010). These results indicate that empathic and social dominance orientations have independent over time influence on environmentalism.

Notably, the predicted indirect effects were also significant. Gender predicted residualized change in environmental values indirectly via both empathy (*b* = −.035, post. SD = .012, *p* = .001, 95% CI = −.058, −.012) and SDO (*b* = −.019, post. SD = .008, *p* = .007, 95% CI = −.034, −.004), and empathy and SDO in turn exerted a lagged effect on environmental values. Gender also retained a direct (unmediated) effect on residualized change in environmental values (β = −.068, *p* < .001, *b* = −.210, post. SD = .047, 95% CI = −.302, −.118), but the statistically significant indirect effects suggest that both empathy and SDO partially explained the observed gender differences in endorsement of environmental values.

4. Discussion

Past research has shown a consistent (albeit small) gender difference in pro-environmental attitudes and behaviours, with women showing higher levels of environmentalism compared to men. The present study examined whether this gender difference in environmentalism could be explained by both empathic and social dominance orientations. Bayesian mediation analysing data from a one-year longitudinal national probability adult sample supported predictions. As expected, women reported higher endorsement of the value of protecting the environment (preserving nature) than men. More importantly, both empathy and SDO partially and independently mediated the gender–environmentalism link. Part of the reason why women endorse more environmental values is because women tend to have *higher* levels of empathy and *lower* levels of social dominance orientation, whereas