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Abstract: Political right-wing orientation correlates with climate change denial in several Western countries. Politicians and voters of far-right (i.e., radical and extreme right-wing) parties seem to be particularly inclined to dismiss climate change but the reason for this is unclear. Thus, the present paper investigates if and why climate change denial is more common among voters of the radical right-wing party Sweden Democrats as compared to voters of a mainstream right-wing party (the Conservative Party, Moderaterna), and compares both these voter groups with center-left (Social Democrat) voters. In four regression analyses, distrust of public service media (Swedish Television, SVT), socioeconomic right-wing attitudes, and negative attitudes toward feminism and women were the strongest predictors of climate change denial. These variables outperformed conservative ideologies (Right-Wing Authoritarianism and Social Dominance Orientation), anti-immigration attitudes, distrust of the Parliament and courts, and belief in conspiracies, in predicting denial. Party preferences explained only a small or zero part of variance in denial over and above these variables. The results suggest that even though radical and mainstream right-wing parties emphasize different sociopolitical issues and anti-establishment messages, similar psychological factors seem to explain why these voter groups differ from each other and from left-wing voters in climate change denial. However, the included independent variables were intercorrelated, which calls into question to what degree they can be separated when explaining psychological underpinnings of climate change denial.

Keywords: climate change denial; radical right; populism; institutional distrust; conservative ideology; sociopolitical attitudes

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Introduction

Despite the extensive scientific evidence supporting human induced climate change (Cook et al., 2016), climate change denial still exists in society and contributes to delaying climate action (Cann & Raymond, 2018; Oreskes & Conway, 2010). Being an issue that needs to be solved through wide-ranging political solutions and societal reforms, climate change has become politicized in several countries, with politically right-leaning individuals expressing more climate change denial and opposition to climate policies than individuals that lean toward the left (Poortinga, Spence, Whitmarsh, Capstick, & Pidgeon, 2011; Hornsey, Harris, Bain, & Fielding, 2016; McCright & Dunlap, 2003). Recent analyses suggest that politicians and voters of far-right (i.e., radical and extreme) parties are particularly inclined to dismiss climate change (Lockwood, 2018; Forchtner & Kølvråa, 2015; Forchtner, Kroneder, & Wetzel, 2018) but only a few studies have to date empirically investigated possible explanations for this.

Socioeconomic and sociocultural explanations

It has been suggested that protection of the industrialized capitalist system and free-market economy is an important explanation for climate change denial, which could explain why denial is more common among right-wing voters (Hoffarth & Hodson, 2016; McCright, Marquart-Pyatt, Shwom, Brechin, & Allen, 2016). Supporting socioeconomic explanations also among *radical* right-wing voters, the correlation between Trump support and climate change denial is partly mediated by aversion to wealth distribution (Panno, Carrus, & Leone, 2019). However, many radical right-wing parties tend to take vague positions on socioeconomic issues (Rovny, 2013). Also, many of their voters have previously voted for different parties across the political spectrum and express on average *less* right-leaning socioeconomic preferences than voters of the mainstream right-wing parties (Ivarsflaten, 2005; Jylhä, Rydgren, & Strimling, 2019a). Thus, additional explanations need to be explored to increase understanding of why radical right-wing supporters more strongly oppose climate messages.

The sociocultural issues promoted by the radical right could also be considered when explaining their tendency for anti-environmentalism (Jylhä & Hellmer, 2019; Lockwood, 2018). The core issue of the radical right is to limit immigration and they express exclusionary sociocultural preferences in other domains as well, as illustrated in their opposition to multiculturalism and societal focus on minority groups and feminism (Mudde, 2007; Mudde & Rovira Kaltwasser, 2013; Rooduijn, Burgoon, van Elsas, & van de

Werfhorst, 2017; Rydgren, 2007). In line with this, radical right-wing politicians and voters tend to hold socially conservative and authoritarian ideological attitudes (Mudde, 2007; van Assche, van Hiel, Dhont, & Roets, 2018) which strongly predict a generalized tendency to hold negative attitudes towards multiple disadvantaged social groups (Ekehammar, Akrami, Gylje, & Zakrisson, 2004; Bergh, Akrami, Sidanius, & Sibley, 2016).

Indeed, climate change denial correlates with conservative ideology (authoritarianism and support for group-based hierarchies: Milfont, Richter, Sibley, Wilson, & Fischer, 2013; Stanley & Wilson, 2019), negative attitudes toward immigration (Krange, Kaltenborn, & Hultman, 2018; Ojala, 2015), and an index capturing different exclusionary sociocultural preferences (opposition to e.g. multiculturalism and feminism: Jylhä & Hellmer, 2019). Also, environment and environmentalism are widely considered as stereotypically feminine, and anti-environmentalism could thus reflect promotion of masculine hegemony (Anshelm & Hultman, 2014; Bloodheart & Swim, 2010). However, these sociocultural views are interrelated and correlate also with socioeconomic attitudes (Bergh et al., 2016; Azevedo, Jost, Rothmund, & Sterling, 2019) and it is unknown if they uniquely contribute in explaining variance in climate change denial.

Institutional distrust

Radical right-wing parties tend to accuse societal institutions for promoting internationalization and minority rights at the expense of the (native) people (Mudde, 2007; Mols & Jetten, 2015; Rydgren, 2007). The most important targets of these accusations are the mainstream politicians, with whom the other societal institutions are claimed to conspire. Because of this populist rhetoric, radical right-wing parties both attract distrustful voters and increase political cynicism among their supporters (Rooduijn, van der Brug, de Lange, & Parlevliet, 2017).

Institutional distrust correlates also with anti-environmental attitudes and beliefs (Harring & Jagers, 2013; Ojala, 2015; Vainio & Paloniemi, 2011). Overlap between far-right voting, institutional distrust, and climate change denial could be due to a conspiratorial worldview, where politician, scientist, and media are perceived as corrupt and malevolent (cf. Mudde, 2004; Castanho Silva, Vegetti, & Littvay, 2017). Another explanation could be that both climate change denial and the anti-establishment views of the radical right reflect more specifically a distrustful stance toward the liberal and cosmopolitan parts of the establishment, meaning that populist arguments are used more instrumentally to challenge the unwanted

processes that these institutions are promoting, and to thereby protect the traditional lifestyles and power structures (Jylhä & Hellmer, 2019; Stavrakakis, Katsambekis, Nikisianis, Kioupiolis, & Siomos, 2017; Rydgren, 2017; see also Lockwood, 2018).

Aims and hypotheses

Only a few studies have empirically investigated why climate change denial is linked to far-right support. To address this gap in the literature, we will run a series of hierarchical regression analyses including simultaneously several variables that have been suggested to explain why right-wing voters in general, or radical right-wing voters in particular, tend to deny climate change (Jylhä & Hellmer, 2019; Lockwood, 2018; McCright et al., 2016; Panno et al., 2010): 1) two indexes for conservative ideology: Right-Wing Authoritarianism (authoritarian submission and aggression, and conventionalism: Altemeyer, 1998) and Social Dominance Orientation (acceptance and promotion of group-based hierarchies: Pratto, Sidanius, Stallworth, & Malle, 1994); 2) Socioeconomic attitudes; 3) Exclusionary sociocultural attitudes (negative attitudes toward immigration and feminism), and 4) Institutional distrust and belief in conspiracies. We also investigate if these variables account for the differences between voter groups classified as radical right (Sweden Democrats), mainstream right (Conservative Party, *Moderaterna*) or left (Social Democrats).

We expect that climate change denial is not only predicted by socioeconomic attitudes, but also by sociocultural attitudes, meaning that approving attitudes of free-market economy and societal group-based power structures complement each other in explaining denial. These attitudes were also expected to outperform conservative ideologies in explaining climate change denial in the full model, thereby implicating a possible mediation effect whereby the more proximal right-wing attitudes help explain the correlation between conservative ideology and denial (cf. Jylhä & Hellmer, 2019). Finally, we expected that institutional distrust explains variance in denial over and above the effects of conservative ideology and sociopolitical views (cf. Ojala, 2015), but that these sets of variables are intercorrelated given the liberal and cosmopolitan context of contemporary Sweden.

Method

Participants

Participants were 2217 Sweden Democrat supporters, 634 Conservative Party supporters, and 548 Social Democratic Party supporters, as indicated by the question, ‘How

would you vote if there were an election for the parliament today'? Age ranged between 18 and 79 among Sweden Democrat voters ($M=55.8$, $SD=15.3$) between 18 and 79 among Conservative Party voters ($M=55.9$, $SD=17.0$), and between 19 and 79 among Social Democrat voters ($M=54.4$, $SD=17.9$). In all voter groups, most respondents were male (72/65/54%) and had either university (37/50/43%) or high school education (50/42/47%).

Data were collected during spring 2018 by the independent research company Novus at the request of the authors. A selection of panelists was invited from the Sweden Panel, a randomly recruited pool of approximately 40,000 volunteers. Also, 239 of the participants were recruited by a market research company Norstats. This study was conducted following the ethical and professional principles from ICC/ESOMAR International Code on Market, Opinion and Social Research and Data Analytics. For full description of data collection, see Jylhä, Rydgren, and Strimling (2019b).

Measures and procedure

Climate change denial was measured by item 'Global warming that is caused by humans is happening' (reversed). We also measured *socioeconomic right-wing attitudes* (three items, $\alpha = .72$, example: 'Taxes should be reduced'), *negative attitudes toward immigration* (three items, $\alpha = .94$, example: 'Immigration to Sweden should be reduced'), *negative attitudes toward feminism and women* (three items, $\alpha = .77$, example: 'Feminism has gone too far'), *Right-Wing Authoritarianism* (three items, $\alpha = .53$, example: 'To stop the radical and immoral currents in the society today there is a need for a strong leader'), *Social Dominance Orientation* (three items, $\alpha = .60$, example: 'It's probably a good thing that certain groups are at the top and other groups are at the bottom'), *distrust of the Parliament and courts* (two items, $\alpha = .83$, example: 'To what degree do you trust that *Riksdagen* manages its work?', reversed), *distrust of a public service media* ('To what degree do you trust news reporting from the following media': SVT [Swedish Television], reversed), and *belief in conspiracies* (six items, $\alpha = .79$, example: 'A lot of important information is withheld from the public due to self-interest of politicians'). Participants indicated their agreement on these items by a scale ranging from 1 (*disagree completely* or *definitely not true*) to 5 (*agree completely* or *definitely true*), or 6 (*don't know*: handled as missing values) (For full scales, see Supplementary material). We also measured age, gender (female = 0; male = 1), and education level (0 = elementary school or high school; 1 = university education).

Results

Initial analyses

Majority of respondents agreed that the statement “Global warming that is caused by humans is happening” is *probably* or *definitely true* (65-93%). It was more common to find this statement to be *definitely* or *probably not true* among Sweden Democrat voters (4/10%) than among Conservative Party voters (1/4%) or Social Democratic Voters (0.6/0.7%).

This statement was reverse coded to capture climate change denial. Confirming the above described patterns, Sweden Democrat voters scored highest in climate change denial, followed by voters of the Conservative Party and Social Democrats (see Table 1).

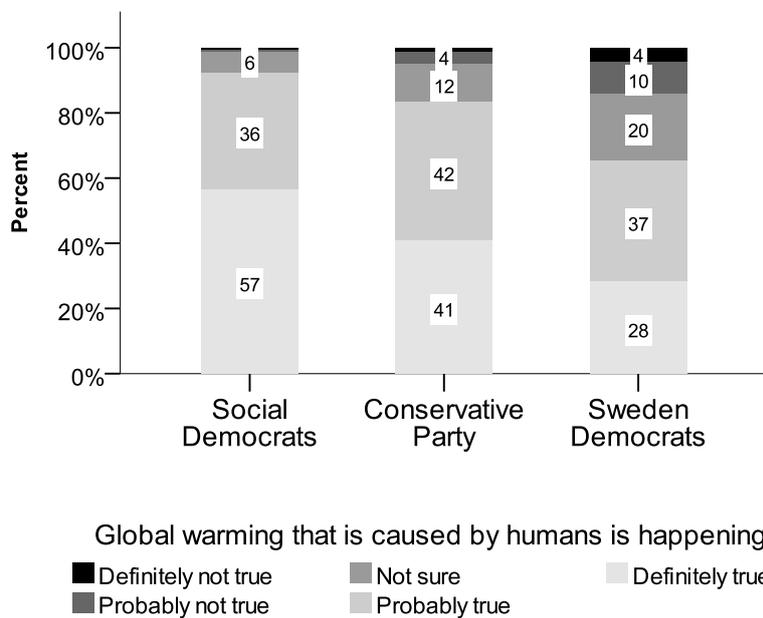


Figure 1. Prevalence of agreeing that human-induced global warming is happening among Social Democrat, Conservative Party, and Sweden Democrat voters.

Results of a multivariate ANOVA revealed that, Sweden Democrat voters scored highest in most independent variables, followed by Conservative Party voters and Social Democrat voters (see Table 1), with two exceptions: Sweden Democrat voters scored highest in believing in conspiracies, but Social Democrat and Conservative Party voters did not differ from each other. Conservative Party voters scored highest, and Social Democratic voters scored lowest, in socioeconomic right-wing attitudes.

Table 1.*Mean Values (Standard Deviations) and Effect Sizes of Mean Value Differences Between Voter Groups.*

	Social Democrats	Conservative Party	Sweden Democrats	η^2
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	
Climate change denial	1.53 (0.7)	1.82 (0.9)	2.25 (1.1)	.07
Socioeconomic right-wing attitudes	2.14 (0.8)	3.82 (0.8)	3.58 (0.9)	.28
Anti-feminism	2.28 (1.1)	2.94 (1.0)	3.55 (0.9)	.19
Anti-immigration	2.87 (1.3)	4.07 (1.0)	4.82 (0.4)	.47
Distrust, Parliament and courts	2.41 (0.8)	3.04 (1.0)	3.94 (0.9)	.30
Distrust, Public service media	1.79 (0.7)	2.39 (1.1)	3.37 (1.3)	.22
Social Dominance Orientation	1.57 (0.7)	2.20 (0.8)	2.32 (0.8)	.11
Right-Wing Authoritarianism	1.53 (0.8)	2.97 (0.9)	3.58 (0.8)	.21
Belief in conspiracies	2.42† (0.8)	2.42† (0.8)	2.76 (0.9)	.04†

† = non-significant difference between Social Democrat and Conservative Party voters. All other group differences statistically significant ($ps < .01$)

Correlation and regression analyses

Climate change denial correlated positively with all independent variables and with the control variables age and gender (see Table 2). Having a university education correlated very weakly with climate change denial ($r = -.05$) and was thus omitted from the further analyses.

In a series of hierarchical regression analyses predicting climate change denial, independent variables were: conservative ideologies (Step 1), socioeconomic right-wing attitudes (Step 2), exclusionary sociocultural attitudes (negative attitudes toward immigration and feminism) (Step 3), anti-establishment views and belief in conspiracies (Step 4), and party

support (Step 5). In each regression analysis, only those participants' data, who supported the parties in comparison, were included.

Across all voter groups, all included sets of psychological variables explained variance in climate change denial (see Table 3). The strongest predictor was distrust of public service media. Socioeconomic attitudes and anti-feminist attitudes explained roughly the same share of variance in denial. Social Dominance Orientation had a weak effect on climate change denial in analyses including Sweden Democrat voters. Party support explained either zero or a very small (1%) part of denial above the effect of these variables, and in one analysis this correlation switched direction from positive to negative indicating a suppression effect due to other intercorrelated variables. The effects of all other variables vanished in the full model. No serious concerns were detected regarding multicollinearity assumptions in analyses including the psychological variables (Tolerances > .52).

Analyses controlling for age and gender did not alter the main results. Age, but not gender, explained some additional variance in climate change (1-2%) among voters of Social Democrats and Conservative Party ($\beta = .15$), Social Democrats and Sweden Democrats ($\beta = .12$), Conservative Party and Sweden Democrats ($\beta = .13$), and Sweden Democrats ($\beta = .13$) ($ps < .001$).

Table 2.

Bivariate Correlations Between the Variables.

	1	2	3	4	5	6	7	8	9	10
1. Climate change denial										
2. Socioeconomic right-wing attitudes	.30									
3. Anti-feminism	.31	.33								
4. Anti-immigration	.25	.42	.51							
5. Distrust, Parliament and courts	.28	.33	.40	.52						
6. Distrust, Public service media	.36	.40	.38	.41	.58					
7. Social Dominance Orientation	.21	.32	.32	.31	.23	.27				
8. Right-Wing Authoritarianism	.25	.30	.49	.55	.43	.37	.34			
9. Belief in conspiracies	.16	.13	.33	.27	.36	.21	.15	.33		
10. Male gender	.10	.13	.20	.14	.10	.16	.09	.12	-.06	
11. Age	.14	.13	.06	.11	.02†	-.02†	-.08	.09	.07	.06

† = non-significant, All other correlations statistically significant ($ps < .05$)

Table 3.

Summary of Hierarchical Multiple Regression Analysis Predicting Climate Change Denial in analyses including (1) Mainstream Voters, (2) Mainstream Left-Wing voters and Radical Right-Wing Voters, (3) Right-Wing Voters, and (4) Radical Right-Wing Voters.

Variable	1. Social Democrat & Conservative Party		2. Social Democrat & Sweden Democrat		3. Conservative Party & Sweden Democrat		Sweden Democrat	
	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.08***		.08***		.05***		.03***	
Social Dominance Orientation		.17***		.15***		.11***		.11***
Right-Wing Authoritarianism		.18***		.19***		.16***		.11**
Step 2	.04***		.06***		.04***		.04***	
Social Dominance Orientation		.08*		.09***		.08***		.08**
Right-Wing Authoritarianism		.14***		.11***		.15***		.08**
Socioeconomic Attitudes		.22***		.27***		.19***		.21***
Step 3	.02***		.03***		.03***		.03***	
Social Dominance Orientation		.06†		.06**		.06**		.06**
Right-Wing Authoritarianism		.07*		.05*		.07***		.05*
Socioeconomic Attitudes		.19***		.22***		.18***		.20***
Antifeminism		.15***		.19***		.18***		.17***
Anti-immigration		.01		-.01		.04†		-.02
Step 4	.04***		.03***		.04***		.03***	
Social Dominance Orientation		.04		.05**		.05*		.05*
Right-Wing Authoritarianism		.07†		.02		.04†		.02
Socioeconomic Attitudes		.13***		.17***		.14***		.15***
Antifeminism		.13***		.16***		.14***		.14***
Anti-immigration		-.02		-.04		-.00		-.03
Distrust, Parliament and courts		.03		.03		.03		.02
Distrust, public service media		.21***		.18***		.19***		.17***
Belief in conspiracies		-.01		.02		.03		.03
Step 5	.005**		.00		.01***			
Social Dominance Orientation		.05		.05**		.05**		
Right-Wing Authoritarianism		.06†		.02		.03		
Socioeconomic Attitudes		.19***		.16***		.15***		

Antifeminism	.13***	.16***	.14***
Anti-immigration	-.00	-.04	-.03
Distrust, Parliament and courts	.04	.02	.02
Distrust, public service media	.21***	.18***	.18***
Belief in conspiracies	-.02	.02	.03
Party support	-.10**	.00	.08***
Total R^2	.17	.19	.15
N	1140	2633	2737
			2115

*** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$

Discussion

The results showed that majority of participants believe that human-induced climate change is happening. Climate change denial was more common among voters of the radical right-wing party Sweden Democrats than among mainstream right-wing (Conservative Party) voters, and very uncommon among center-left (Social Democrat) voters. As expected, socioeconomic right-wing attitudes predicted denial (cf., McCright et al., 2016). We found that also anti-feminism has a unique effect on denial, perhaps indicating a link between anti-environmentalism and a motivation to protect the traditional gender norms and masculine hegemony (see Anshelm & Hultman, 2014; Bloodheart & Swim, 2010). The effect of anti-immigration attitudes was weaker than anti-feminist attitudes, possibly because these attitudes were more common and may thus reflect a wide set of underlying psychological motivations. On the other hand, negative attitudes toward women/feminism and immigrants/immigration are strongly correlated (Table 2; see also Bergh et al., 2016) and is it thus questionable if these attitudes can be fully separated in explanations. Dismissal of climate change could be a part of a more general anti-egalitarian worldview where also the uneven distributions of risks and benefits of climate change are more readily accepted (Jylhä, 2016; Jylhä, Cantal, Akrami, & Milfont, 2016).

Distrust of public service media was the strongest predictor of climate change denial, which could reflect a doubtful stance toward a media outlet that communicates messages that some voters perceive as undesirable (cf. Schulz, Wirth, & Müller, 2018). Distrust of the Parliament and courts did not predict a unique part of variance in denial. Perhaps this variable does not only capture for example cynical perceptions regarding politicians, but also overlaps with the ideological worldviews that a certain sociopolitical system is *not* representing. Indeed, distrust of the Parliament and courts correlated strongly with authoritarian attitudes and negative views on feminism and immigration. The more deeply rooted cynicism regarding politicians' character may not be inherently correlated with

climate change denial, as is supported by the weaker correlation between belief in conspiracies and denial (see Table 2: see also Hornsey, Harris, & Fielding, 2018) and a recently found weak correlation between anti-political establishment attitudes and denial (Jylhä & Hellmer, 2019). Future studies could investigate more systematically to what degree climate change denial reflects political cynicism or distrust.

Conclusions

Results of this well-powered correlation study showed that, even though mainstream and radical right-wing parties differ in their emphasis on different sociopolitical issues and anti-establishment messages (Mudde, 2007; Rydgren, 2007; Rovny, 2013), the same variables seem to explain why these voter groups differ from each other and from left-wing voters in climate change denial. The included variables were intercorrelated, and thus it needs to be studied further if – and to what degree – their effects can be separated when explaining climate change denial. Finally, most participants acknowledge human-induced climate change in all voter groups. Thus, although Sweden Democrat voters deny climate change more commonly than voters of the other included parties, denial is not a defining character of these voters as they are clearly more united in their opposition to immigration.

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Appendix: Full scales

Climate change denial

- Global warming that is caused by humans is happening. (R)

Socioeconomic right-wing attitudes

- Taxes should be reduced.
- The public sector is too large.
- It is good to have private profit-driven alternatives in the care sector.

Attitudes toward immigration

- Immigration to Sweden should be reduced.
- Immigration costs too many public resources.
- Immigration leads to increased criminality in Sweden.

Attitudes toward feminism and women

- Feminism has gone too far.
- Women often seek to gain power by controlling men.
- Women tend to interpret harmless remarks or actions as sexist.

Right-Wing Authoritarianism

- To stop the radical and immoral currents in the society today there is a need for a strong leader.
- Our society would be best off if we showed tolerance and understanding for non-traditional values and views. (R)
- The best way to live is in accordance with the old-fashioned values.

Social Dominance Orientation

- It's probably a good thing that certain groups are at the top and other groups are at the bottom.
- We should strive for increased social equality. (R)
- No one group should dominate in society. (R)

Distrust in the Parliament and courts

- To what degree do you trust that the Parliament (*Riksdagen*) manages its work? (R)
- To what degree do you trust that courts of law manage their work? (R)

Distrust the public service media

- To what degree you trust news reporting the following media? (R)
 - Swedish national public TV (*SVT*)

Belief in conspiracies

- A lot of important information is withheld from the public due to self-interest of politicians.
- There is a small, unknown group that really governs world politics and has more power than the elected leaders in different countries.
- There are groups of researchers who manipulate, fabricate or withhold evidence in order to mislead the public.
- The pharmaceutical industry works to keep people sick, rather than healthy, in order to make greater profits.
- Experiments involving new drugs or technologies are conducted on the public without their knowledge or consent.
- Chemtrails, i.e. deliberate discharges of substances from aeroplanes that are used to manipulate people or the weather

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