



A matter of time... consideration of future consequences and temporal distance contribute to the ideology gap in climate change scepticism

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ABSTRACT

Factors that contribute to the well-established ideology gap in climate change beliefs (i.e., conservatives' scepticism about climate change and its severity) remain underexplored. In the present research, we propose that there are differences in the consideration of future consequences, as well as the perception of climate change in time, between conservatives and liberals which, in part, contribute to this gap. Across three studies (total $N = 654$) in the Netherlands and the UK, we demonstrate that, compared to liberals, conservatives tend to consider future consequences of their behaviour less and perceive the effects of climate change as further away in the future. Furthermore, we find that temporal distance to climate change, and, to a lesser extent, consideration of future consequences, can partially account for higher levels of scepticism about climate change on the conservative side of the ideological spectrum. Besides contributing to a better understanding of this ideology bias, these results have implications for climate change communication.

1. Introduction

Despite the clear scientific consensus on the need to substantially reduce greenhouse gas emissions to curb seismic consequences of climate change (Intergovernmental Panel on Climate Change, 2021), there is still a considerable proportion of the public that has doubts about the severity or even the reality of anthropogenic climate change. While many people in the EU—around 90%—accept that climate change is happening, a considerably lower number believes that climate change has negative consequences. For example, relatively recent numbers show that in the UK, 34% of the population is not convinced the effects of climate change will be serious, while in the Netherlands, this proportion is 39.4% (Poortinga et al., 2018). This gap between the scientific consensus on the urgency of climate change and public opinion has been the subject of intensive research in recent years. Many of these studies consistently find political ideology to be an important determinant of scepticism surrounding climate change (i.e., belief in the existence and/or anthropogenic causes of climate change). For example, a meta-analysis by Hornsey et al. (2016) found political conservatism to be a robust predictor of climate change beliefs. Though the relationship seems to be strongest in the US (Hornsey et al., 2018), it has also been

identified in other Western countries (McCright et al., 2016a; Rutjens & van der Lee, 2020; Rutjens et al., 2018).

However, the psychological underpinnings of this link are less clear. There is some evidence to suggest that system justification processes play a role in it (Feygina et al., 2010), possibly because individuals on the right side of the political spectrum see climate change mitigation as threatening to the current socio-economic system (Clarke et al., 2019). Nonetheless, other potential individual-level variables through which political ideology might contribute to climate scepticism remain underexplored. For instance, as argued by Baldwin and Lammers (2016), conservatives and liberals might relate differently towards the past and the future, with liberals being more oriented towards the future, and conservatives focusing more on the past. This difference might stem from conservatives' value-based priority to preserve the ways of the past, while liberals hold change in higher regard (Caprara et al., 2006); or from the stronger tendency of conservatives to avoid uncertainty (Jost et al., 2008), which is inherent in planning for the future. Indeed, there is some preliminary evidence for the distinct temporal preferences of liberals and conservatives. More specifically, conservative (vs. liberal) language tends to use more past (vs. future) tense (Robinson et al., 2015), and conservatives (as opposed to liberals)

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in China focus more on their past experiences, while liberals focus more on the future (Li & Cao, 2020). Similarly, consideration of future consequences (CFC)—the extent to which people consider the more distant versus more immediate consequences of their actions (Strathman et al., 1994)—was found to negatively correlate with conservative political ideology in the US (Joireman & Liu, 2014). Because of a considerable time lag between actions and the (increasingly negative) consequences of those actions when it comes to climate change, this tendency can have implications for the ideological gap in climate change beliefs. In other words, it is likely that individuals inclined to consider future consequences to a lesser extent (i.e., conservatives as opposed to liberals) might also see climate change as less of an issue.

Considering the importance of temporal aspects of climate change for the ideological gap in climate change attitudes, Baldwin and Lammers (2016) showed that conservatives endorse messages that compare the present environment to that of the *past* (vs. the *future*) more, and report higher pro-environmental attitudes when exposed to such messages. However, two recent replication studies were not successful in finding a consistent effect of temporal message framing on pro-environmental attitudes (Kim et al., 2021; Stanley et al., 2021). In light of these inconclusive findings, employing an individual differences approach to the interplay between ideology, time-related variables, and climate change beliefs could help clarify these relationships. This could be an important step before (re)designing experimental manipulations to reduce conservatives' climate change scepticism.

To our knowledge, individual differences in the extent to which people are oriented towards the future (i.e., consider future consequences of their behaviour), as well as where they position climate change consequences in time (i.e., temporal distance to climate change) have not yet been studied as potential contributors of the ideological gap in climate change beliefs. However, both constructs have been examined in the context of climate change beliefs and/or political ideology from different standpoints (see sections 1.1 and 1.2 for an overview). Drawing on this work, we hypothesise that CFC could have implications for climate change beliefs—even though climate change is already happening, its consequences are spread out in time, with their severity expected to increase in the (somewhat distant) future. Therefore, it is possible that an individual's consideration (or lack thereof) of the future in general, and perceiving climate change as a temporally distant phenomenon, are associated with beliefs about climate change. This suggests that paying less attention to the future, which might be more characteristic of conservative than liberal ideology, in part, contributes to the relationship between conservatism and climate change scepticism. Furthermore, conservatives might see the consequences of climate change as not relevant for the present moment, making this issue easier to downplay or dismiss.

1.1. CFC, climate change beliefs, and political ideology

Higher CFC has been shown to predict various pro-environmental attitudes and behaviours (Beiser-McGrath & Huber, 2018; Milfont et al., 2012), including belief in climate change (Joireman & Liu, 2014; Wang et al., 2019). Furthermore, CFC predicts the perceived seriousness of climate change even when other established predictors such as climate risk perception, trust in experts and scientists, and, most importantly for the present research, political ideology, are accounted for (Zhu et al., 2020). These findings indicate that not only specific pro-environmental attitudes and behaviours, but also more general beliefs about the very existence and perceived seriousness of climate change depend, in part, on the individual's orientation towards future consequences, possibly due to taking the more distant (and graver) consequences more seriously. On the other hand, one US study did not find CFC to be a direct predictor of climate change risk perception. Instead, CFC interacted with political ideology, such that having higher CFC exacerbated the link between ideology and climate attitudes (Hu et al., 2017). However, this conceptualisation of CFC as a moderator

does not take into account the possible relationship between CFC and political ideology, and how it might contribute to climate perceptions.

Although to our knowledge the link between political ideology and CFC has only been found in one US study (Joireman & Liu, 2014), such that conservatism was correlated with lower CFC, differences in other temporal indicators and constructs also corroborate this association. For example, previously mentioned linguistic analyses of conservative and liberal news outlets found that conservative newspapers used past tense, while liberal outlets used future tense to a greater extent. The authors found the same tendency in State of the Union speeches delivered by Republican, as opposed to Democratic U.S. presidents (Robinson et al., 2015; but see also Sterling et al., 2020).

Conceptually closer to CFC are the associations of political ideology and temporal focus (Li & Cao, 2020)—the amount of attention devoted to different points in time (Shipp et al., 2009). More specifically, Li and Cao (2020) found that conservatives had greater past temporal focus, and lower future temporal focus, compared to liberals. Based on this, it can be assumed that comparable associations will arise between political ideology and a temporal construct of great importance for climate change attitudes—the (lack of) consideration of future consequences of one's actions.

1.2. Temporal distance, climate change beliefs, and political ideology

Besides general CFC, ideological differences could also be evident in perceived temporal distance to climate change consequences. The concept of temporal distance, as an aspect of psychological distance, is primarily grounded in Construal Level Theory (CLT; Trope & Liberman, 2010; but see also Brügger, 2020). According to CLT, if the effects of climate change are perceived to be happening *right now* (as opposed to in the distant future), people are more likely to have *concrete* (as opposed to abstract) mental representations of these consequences and therefore to be less sceptical of climate change. Although CLT—and psychological distance more specifically—served as a basis for a substantial volume of work aimed at understanding climate change-related attitudes, intentions and behaviours, not many studies systematically assess the influence of distinct distance dimensions on climate-related beliefs or behaviour (McDonald et al., 2015). Nevertheless, it has been shown that perceiving climate change consequences as further away in time (i.e., higher temporal distance) relates to less concern about climate change in the UK (Spence et al., 2012), as well as the US (Singh et al., 2017) and Australia (Jones et al., 2017). Furthermore, overall psychological distance (including the temporal dimension, which was highly correlated with other psychological distance dimensions), was highly positively correlated with climate change scepticism (Wang et al., 2019). In line with this, experimental work manipulating the temporal proximity of future climate change impacts demonstrated that depicting climate change effects as closer in time led to more pro-environmental attitudes and behaviour (Bashir et al., 2014).

Though to the best of our knowledge, no studies so far have yet directly investigated the relationship between political ideology and temporal distance to climate change, there is ample indirect evidence for this relationship. First, as pointed out previously, higher concern about climate change consequences is related to perceiving these consequences as temporally closer (Jones et al., 2017; Singh et al., 2017; Spence et al., 2012). Furthermore, rightist (vs. leftist) ideology, as well as party identification, has been consistently found to predict lower worry about climate change (McCright, Marquart-Pyatt, et al., 2016). Therefore, it is likely that conservatives' lower worry about climate change consequences is related to perceiving them as more temporally remote.

Second, assuming conservatives are less oriented towards the future in general (Li & Cao, 2020), "pushing" climate change consequences further into the future might be a particularly convenient way for them to disregard or downplay environmental issues. The motivated reasoning account of conservative rejection of climate change

emphasises the inconvenience climate change poses for the conservative worldview (Jacquet et al., 2014). For example, Campbell and Kay (2014) showed that American Republicans (largely conservative), disagree with climate science more if the solutions are presented as government regulations (compared to free-market-friendly solutions). Similarly, higher general system-justification motives (Feygina et al., 2010) and the perceived threat climate solutions pose to the economy (Clarke et al., 2019) can, in part, explain the link between ideological variables and climate change attitudes. Consequently, we argue that conservatives' heightened motivation to reject climate change due to its societal and economic implications, combined with a lower orientation towards the future in general (Joireman & Liu, 2014; Li & Cao, 2020), could also prompt conservatives to view climate change consequences as further away in time.

1.3. Overview of the present research

The main aim of the present research was to enhance the understanding of the link between political ideology and climate change scepticism by investigating the role of two time-related variables. More specifically, we focused on the domain-general CFC, which captures how one relates *the self* to time, as well as on domain-specific temporal distance to climate change, which indicates how one perceives *the consequences of climate change* in time. Furthermore, CFC can be understood as an individual difference characteristic related to differences in political ideology, whereas temporal distance to climate change could stem from ideologically motivated cognition processes related to climate change (Jacquet et al., 2014).

In light of previous findings showing that conservatives focus more on the past and less on the future (Li & Cao, 2020; Robinson et al., 2015), and consider the remote consequences of their actions less (Joireman & Liu, 2014), we hypothesised that conservative ideology will be negatively correlated with CFC. Drawing on this assumption paired with conservative motivation to reject climate change (Jacquet et al., 2014), as well as conservatives' lower worry about climate change (e.g., McCright, Marquart-Pyatt, et al., 2016), we hypothesised that conservative ideology will be positively correlated with temporal distance to climate change consequences. Next, based on findings linking CFC (e.g., Milfont et al., 2012; Wang et al., 2019) and temporal distance to climate change (e.g., Spence et al., 2012; Wang et al., 2019) to various environmental attitudes and behaviours, we expected that low CFC and high temporal distance to climate consequences will be related to climate change scepticism. Finally, we integrated these two propositions into the prediction that low CFC and high temporal distance to climate change consequences contribute to the relationship between conservative ideology and climate scepticism. More specifically, we expected the predictive power of ideology to be significantly reduced when general CFC and temporal distance related to climate change are accounted for. Having CFC as a domain-general measure of temporal orientation, as well as a domain-specific measure of temporal perception of climate change, perhaps partly rooted in ideologically motivated cognition, enables us to assess to what extent each contributes to ideological differences in climate change beliefs. An overview of hypothesised relationships between constructs is given in Fig. 1.

We tested these ideas in three samples, including a pilot study. The first two studies were conducted in the Netherlands, while Study 2 was conducted in the UK.¹ Studies in the Netherlands were conducted in Dutch, while the UK study was conducted in English. In the pilot study, we explored CFC (along with an additional related construct, see Pilot study section below) as a potential underlying variable in the relationship between political ideology and climate change scepticism. In Study 1, we tested CFC and temporal distance to climate change. Finally, in Study 2, we aimed to replicate the findings of Study 1 in a different population, while also controlling for perceived system threat of climate mitigation measures, which was previously found to partially account for the relationship between ideological variables and climate change

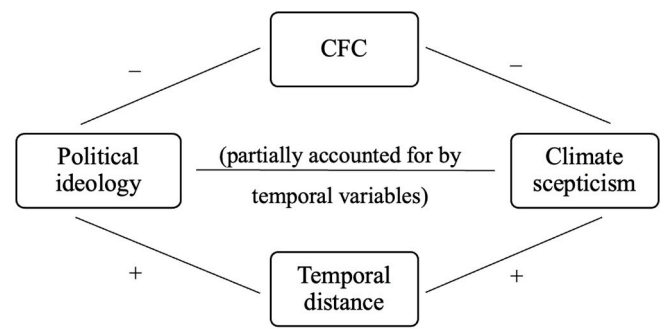


Fig. 1. Schematic overview of hypothesised relationships. Note. CFC = Consideration of future consequences. Lines in this graph do not imply causality.

beliefs in the US (Clarke et al., 2019).

1.3.1. Analytical approach

Our focal hypotheses involve the contributions of two variables (i.e., CFC and temporal distance to climate change) to the relationship of a predictor (political ideology) and an outcome (climate change scepticism). More specifically, we suggest that temporal variables might help account for part of the variance in the relationship between political ideology and climate change scepticism. To compare the predictive power of political ideology before and after introducing temporal variables, we use hierarchical regression analysis. To this end, we focus on semi-partial correlations, which reflect the unique variance that the independent variable explains in relation to the total variance in the dependent variable. As such, comparing semi-partial correlations of a predictor (i.e., political ideology) and the dependent variable (i.e., climate scepticism) in consecutive regression steps reflects the relative importance of this predictor after additional predictors (i.e., temporal variables) are introduced. Moreover, to provide additional evidence that the extent of the reduction in the explanatory power of political ideology after accounting for temporal variables is significant, we conduct mediation analyses, with political ideology as the predictor, climate scepticism as the criterion, and time variables as mediators. It is crucial to point out that in doing so, we do not imply a causal chain usually associated with mediation ($X \rightarrow Z \rightarrow Y$). Instead, we are using mediation (see Appendix A for details) to statistically probe the change in the predictive power of ideology when accounting for temporal variables.

Although this is one among several possible ways of conceptualising the relationships between our variables of interest, it is the one most suitable for our aims—shining light on individual differences in temporal perception that might account for the ideological gap in climate change beliefs.

2. Pilot study

To obtain preliminary insight into the relationships between time-related variables, political ideology and climate change scepticism, we conducted a pilot study ($N = 117$; 85 women; $M_{age} = 34.43$, $SD_{age} = 15.75$; 76.9% non-religious) among Dutch participants recruited online through social networks of the research team. Most (51.7%) participants had obtained a bachelor's degree as the highest completed educational level, whilst 30.8% of all participants were still in education.

Along with CFC, which was our primary interest, we also included a measure of slow life history strategy. This concept from evolutionary psychology implies higher investment in many aspects of life, including making long-term plans (Figueredo et al., 2005). Additionally, slow life history strategy was recently shown to relate to higher CFC and, subsequently, to pro-environmental behaviours (Manríquez-Betanzos, 2018). Although the study had a broader scope than reported in this paper, no other measures that would be of interest to our research

questions and hypotheses were collected. Full study materials can be found at the Open Science Framework: <https://osf.io/gwkqj/>.

2.1. Measures

2.1.1. Climate change scepticism

We used the 16-item Climate Change Denial Scale (Häkkinen & Akrami, 2014; Jylhä & Akrami, 2015), which taps into doubts about both the causes and the urgency of climate change. Example items are “Climate change is natural and not caused by human activity” and “Climate change has a negative effect on the Earth”. Responses were provided on a 7-point Likert scale (1 = *totally disagree*; 7 = *totally agree*). Internal consistency of the scale was good ($\alpha = 0.88$).

2.1.2. CFC

The 12-item Consideration of Future Consequences Scale (Strathman et al., 1994) was used to measure CFC. Participants responded on a 7-point Likert scale (1 = *totally disagree*; 7 = *totally agree*). An example item is: “I am willing to sacrifice my immediate happiness or well-being in order to achieve future outcomes”. The scale showed good internal consistency ($\alpha = 0.78$).

2.1.3. K-life strategy

Mini-K, the 20-item Short-Form of the Arizona Life History Battery (ALHB; Figueredo et al., 2006) was used to assess individual differences in the adoption of the slow life history strategy. The scale included items such as: “I avoid taking risks and I don’t give up until I’ve solved my problems”, and participants responded on a 7-point Likert scale (1 = *totally disagree*; 7 = *totally agree*). The scale showed satisfactory reliability ($\alpha = 0.74$).

2.1.4. Political ideology

We measured political ideology with two 10-point items asking participants: “Where would you position yourself on the scale below when it comes to your political orientation?”. The first question regarded the progressive-conservative dimension,² while the second was about the left-right dimension. Given that these two items had a moderate-to-high correlation ($r = 0.40$), we averaged them into one score.

2.1.5. Demographics

We recorded participants’ age, gender, education (10-point ordinal scale, details available on OSF), and religiosity (*yes/no*).

2.2. Results and discussion

As can be seen in Table 1, political ideology was positively correlated with climate scepticism, and negatively correlated with CFC. Furthermore, climate scepticism was highly negatively correlated with CFC. There was no evidence of an association between slow life history strategy and climate scepticism or political ideology. Hence, we did not include measures of life history in the subsequent studies.

² The meaning of progressive and conservative political orientations was more closely described to participants: “Here, progressive means that you value certain ideals of what life in the Netherlands could look like and how it could improve. You believe in a makeable society. Progress can only be made by adapting or changing the current Dutch system. So, you value progress and change, and are therefore open to it.”; “Here, conservative means that you value preserving what life is like in the Netherlands today or would like to see the Netherlands as it used to be. You value traditions and traditionally existing norms and values in the Netherlands. In addition, you look critically and cautiously at changes and innovations within Dutch society.”

Table 1

Means, standard deviations and zero-order correlations, Pilot study.

	1.	2.	3.	M	SD
1. Climate scepticism	–			2.46	.81
2. CFC	-.63***	–		4.72	.84
3. Slow life history strategy	.03	.15	–	5.39	.72
4. Conservative ideology	.27***	-.21*	.05	3.91	1.65

Note. CFC = Consideration of future consequences.

All Ns varied between 113 and 117.

* $p < .05$, *** $p < .001$.

Next, we conducted a hierarchical regression analysis³ to test the relative importance of ideology in predicting climate scepticism when CFC is introduced as an additional predictor, while also controlling for demographics. Results shown in Table 2 indicate that, in line with our assumptions, CFC predicts climate scepticism, while also substantially reducing the initial effect of political ideology; in the second model, ideology is no longer a statistically significant predictor. Step 1 accounted for only 9%, ($Adj. R^2 = 0.09$, $F(5,106) = 3.07$, $p = .013$), while Step 2 accounted for 41% of variance explained, ($Adj. R^2 = 0.41$, $F(6,105) = 13.69$, $p < .001$).

Finally, to further probe the reduction in the predictive power of political ideology after accounting for CFC, we conducted a mediation analysis using the PROCESS macro (Model 4, version 3.4; Hayes, 2013) for SPSS (version 26). Controlling for age, gender, education and religiosity, the indirect effect of political ideology on climate scepticism through CFC was not significant. However, the rest of the model was consistent with the hierarchical regression results—whilst the total effect of political ideology on climate scepticism was statistically significant, the direct effect (after accounting for CFC as a mediator) was not. Details of this analysis can be found in Appendix A (Figure A.1; Table A.1).

The pilot study results provide preliminary support for our assumption that the relationship between climate scepticism and political ideology can, partially, be explained through individual differences in CFC. Conservatives⁴ were less inclined to consider outcomes further away in the future, which was in turn associated with more scepticism about climate change.

3. Study 1

Based on the results of the pilot study, Study 1 focused on CFC as a promising individual difference variable for contributing to the relationship between political ideology and climate scepticism. Additionally, we tested temporal distance to climate change consequences as a potential contributor to the above-mentioned relationship. In this way, we were able to assess the roles of both *general* temporal focus, as well as *domain-specific* influences.

3.1. Participants

Three hundred and eighteen Dutch-speaking participants were recruited through social media and students’ networks. However, 119 respondents did not complete the questionnaire and an additional 19 failed the attention check, leaving 186 (149 women, $M_{age} = 28.6$, $SD_{age} = 12.98$) respondents for the final analyses. Sensitivity power analysis using G*Power (Faul et al., 2009) indicated that we had 80% power to detect effects as small as $r^2 = 0.03$ in a linear regression with 7

³ Assumptions for conducting a linear regression analysis in all three studies were tested and overwhelmingly met. Details of the assumption checks can be found on OSF: <https://osf.io/cv7f8/>.

⁴ For ease of reading, even though our measure is continuous, we use the term *conservatives* to refer to people with higher scores on the combined political ideology measure.

Table 2
Hierarchical regression predicting climate change scepticism, Pilot study.

	Step 1				Part <i>r</i>	Step 2				
	β	95% CI	<i>p</i>			β	95% CI	<i>p</i>	Part <i>r</i>	
Age	.06	-.14	.25	.568	.05	.10	-.06	.026	.206	.09
Gender (female)	.12	-.07	.30	.221	.11	.10	-.05	.25	.193	.10
Education	-.16	-.35	.02	.085	-.16	-.02	-.17	.14	.826	-.02
Religious (yes)	-.14	-.33	.05	.136	-.14	-.03	-.18	.13	.735	-.03
Conservative ideology	.23	.03	.42	.022	.21	.10	-.06	.26	.205	.09
CFC	—	—	—	—	—	-.60	-.76	.45	<.001	-.56
Adj. R^2	.09 ($p = .013$)					.41 ($p < .001$)				
ΔR^2	—					.31 ($p < .001$)				

Note. CFC = Consideration of future consequences. Part *r* = semi-partial *r*. N = 112, due to listwise omission of incomplete cases.

predictors, which was our primary analysis.

Most participants (90%) did not identify as religious and were currently students (59.7%). In the total sample (students and non-students combined), 45.2% had a bachelor's or master's degree obtained.

3.2. Measures

Complete study materials, including those not reported here (due to irrelevance for the present RQ and hypotheses), can be found here: <https://osf.io/fcts9/>.

3.2.1. Climate change scepticism

A 5-item scale was used to assess participants' scepticism towards climate change (Lewandowsky et al., 2013; Rutjens et al., 2018). Participants indicated their agreement with each statement (e.g., "Humans are too insignificant to have an appreciable impact on global temperature") on a 5-point Likert scale, ranging from 1 (*totally disagree*) to 5 (*totally agree*). Internal consistency of this scale was acceptable ($\alpha = 0.72$).

3.2.2. CFC

We used the same scale as in the pilot study ($\alpha = 0.78$).

3.2.3. Temporal distance to climate change

To assess perceived temporal distance to consequences of climate change, we used two items⁵ from Jones et al. (2017) psychological distance to climate change scale: "Climate change is harming people right now all over the world" and "Climate change is an immediate threat affecting people right now". Responses were given on a 5-point Likert scale from 1 (*totally disagree*) to 5 (*totally agree*). Both items were reverse coded so that a higher mean score indicated higher temporal distance. The correlation between these two items was high ($r = 0.61$).

3.2.4. Political ideology

We measured political ideology with two 9-point items ("Where would you consider yourself on the scale below when it comes to your political orientation?"), asking participants to position themselves on a progressive-conservative, as well as left-right dimension. Given that these two items had a moderate-to-high positive correlation ($r = 0.54$), we averaged them into one score.

⁵ Across both Studies 1 and 2, we collected data on best-loading items for all distance to climate change dimensions—alongside temporal, we measured social, geographical, as well as hypothetical distance to climate change (Jones et al., 2017). For temporal distance, 3 items that had best factor loadings in the Jones et al. (2017) study were measured, however, the third item ("Future generations are more likely to feel effects of climate change") made the scale unreliable, so we did not include it in the analyses.

3.2.5. Demographics

We recorded participants' age, gender, education level (10-point ordinal scale, details available on OSF), and religiosity (yes/no).

3.3. Results and discussion

As can be seen in Table 3, political ideology correlated comparably and as predicted with climate scepticism, CFC, as well as temporal perception of climate change consequences—participants scoring higher on conservatism were more sceptical about climate change, less focused on the future, and perceived climate consequences as further away in time. CFC was negatively correlated with climate scepticism, although the strength of the association was notably lower than in the Pilot study. Temporal distance to climate change was strongly positively correlated with climate scepticism, and moderately negatively correlated with CFC.

Next, we conducted a hierarchical linear regression analysis to test the relative importance of ideology in predicting climate scepticism when CFC and temporal distance to climate change consequences are introduced as additional predictors. The results (Table 4) provided support for our assumptions. CFC predicted climate scepticism over and above political ideology, age, gender, education and religiosity. This model explained 29% of the variance ($Adj. R^2 = 0.29, F(6, 177) = 13.55, p < .001$). In the next step, temporal distance to climate consequences was also a significant predictor, taking into account all other variables. This domain-specific variable had greater predictive power than general CFC, and the final model explained 41% of the variance in climate scepticism ($Adj. R^2 = 0.41, F(7, 176) = 19.21, p < .001$). Crucially for our hypotheses, it is evident that the relative importance of political ideology, reflected in semi-partial correlations, was substantially reduced following the introduction of both time-related variables in the model. Interestingly, the relative importance of CFC was slightly diminished after introducing temporal distance to climate change in the model. This suggests that general disregard of future consequences might partly contribute to climate scepticism through perceiving climate change as less consequential for the present.

Having demonstrated the notable decrease in semi-partial correlations of political ideology after introducing both temporal variables, we additionally tested this reduction through parallel mediation analysis.

Table 3
Means, standard deviations and zero-order correlations, Study 1.

	1.	2.	3.	<i>M</i>	<i>SD</i>
1. Climate scepticism	—			1.83	.55
2. CFC	-.36***	—		3.63	.47
3. Temporal distance to climate change	.54***	-.31***	—	2.39	.87
4. Conservative ideology	.47***	-.37***	.40***	3.28	1.53

Note. CFC = Consideration of future consequences.

All *N*s = 186.

*** $p < .001$.

Table 4
Hierarchical regression predicting climate change scepticism, Study 1.

	Step 1				Step 2				Step 3						
	β	95% CI	<i>p</i>	Part <i>r</i>	β	95% CI	<i>p</i>	Part <i>r</i>	β	95% CI	<i>p</i>	Part <i>r</i>			
Age	.27	.13	.40	<.001	.25	.24	.11	.38	<.001	.23	.20	.07	.32	.002	.18
Gender (female)	.001	-.13	.13	.994	.001	-.02	-.14	.11	.763	-.02	-.09	-.20	.03	.152	-.08
Education	-.01	-.14	.12	.916	-.01	.01	-.12	.14	.864	.01	.004	-.11	.12	.943	.004
Religious (yes)	-.03	-.16	.11	.702	-.02	-.01	-.13	.12	.944	-.004	.05	-.07	.16	.444	.04
Conservative ideology	.42	.29	.55	<.001	.41	.35	.21	.48	<.001	.31	.21	.08	.34	.002	.18
CFC	–	–	–	–	–	-.20	-.34	-.07	.003	-.19	-.14	-.26	-.01	.029	-.13
Temporal distance	–	–	–	–	–	–	–	–	–	.39	.27	.52	<.001	.34	
<i>Adj. R</i> ²	.26 (<i>p</i> < .001)				.29 (<i>p</i> < .001)				.41 (<i>p</i> < .001)						
ΔR^2	–				.03 (<i>p</i> = .003)				.12 (<i>p</i> < .001)						

Note. CFC = Consideration of future consequences. Part *r* = semi-partial *r*.
N = 184, due to listwise omission of incomplete cases.

This was done using the PROCESS macro (Model 4, version 3.4; Hayes, 2013) for SPSS (version 26). After introducing both temporal variables, the direct relationship of political ideology and climate scepticism was smaller, but still statistically significant. Nevertheless, the 95% confidence intervals for the total, as well as individual indirect effects coefficients did not contain zero, suggesting both mediators accounted for a significant part of the relationship between political ideology and climate scepticism. Details of the analyses can be found in Appendix A (Figure A.2; Table A.2).

3.3.1. Additional analyses

Given that this study had a broader scope, some additional variables collected could be of interest for our hypotheses. More specifically, we measured climate change concern (Spence et al., 2012), as well as perceived uncertainty about climate change (Jones et al., 2017), as part of the broader construct of psychological distance to climate change. Since both of these constructs are suitable for measuring climate-related attitudes in the context of our hypotheses, we replaced climate change scepticism as the dependent variable with both of these variables, in otherwise identical hierarchical regressions. The outcomes were highly comparable with our main analysis and all conclusions made with climate change scepticism as the dependent variable held true. These analyses can be found here: <https://osf.io/tcax6/>.

4. Study 2

In Study 1, we demonstrated that the relationship between conservative political ideology and climate change scepticism can be partly attributed to conservatives being less focused towards future consequences in general, and particularly to perceiving the consequences of climate change as not evident in the present moment. In Study 2, we set out to test the robustness and generalisability of the findings obtained so far utilizing a sample of participants from a different country (the UK). Furthermore, to obtain an ideologically more balanced sample, we preselected participants based on their party affiliation—half of the sample was recruited from participants who indicated an affiliation with the Conservative Party (conservative ideology), while the other half was recruited among Labour supporters (socially progressive). Due to its similarity with political ideology, we used party affiliation to check the robustness of the results obtained with the political ideology self-placement measure. Finally, for a more stringent test of our hypotheses, we investigated whether our findings held when controlling for climate change mitigation threat as a proxy for system justification motives, which have been identified as drivers for the relationship between climate beliefs and ideology (Clarke et al., 2019; Feygina et al., 2010).

4.1. Participants

A priori power analysis (G*Power; Faul et al., 2009) based on the results of Study 1 indicated that to achieve 90% power to detect an *R*² increase of 0.03 (the incremental contribution of CFC to predicting climate scepticism) in a regression with 8 predictors, we would need 342 participants. To account for inattentive participants, we slightly oversampled. A total of 361 UK residents took part in the study via the Prolific Academic online recruitment platform. To obtain a more ideologically balanced sample, we used the preselection setting on the Prolific platform to only advertise the study to those who indicated the Conservative or Labour party as their political affiliation, keeping the number of participants affiliated with these parties close to identical (181 participants indicated an affiliation with the Labour party). Due to not passing one out of two attention checks, 10 participants were excluded from the analyses, therefore the final sample consisted of 351 (223 women, *M*_{age} = 34.6, *SD*_{age} = 12.31; 52.1% non-religious; 47.3% completed a bachelor’s degree or higher) individuals.

4.2. Measures

Complete study materials can be found here: <https://osf.io/qcsjb/>.
Measures of climate change scepticism, CFC and temporal distance to climate change were identical to Study 1 and showed good internal consistency ($\alpha = 0.79$, $\alpha = 0.85$ and $r = 0.67$, respectively).

4.2.1. Climate change mitigation threat

To capture the extent to which climate action is perceived to threaten the current socioeconomic system, we used the 12-item Climate Change Mitigation Threat Scale (e.g., “Dealing with climate change by decreasing the use of fossil fuels will result in economic instability”; Clarke et al., 2019). Responses were provided on a 7-point Likert scale (1 = *totally disagree*; 7 = *totally agree*) and the scale showed very good internal consistency ($\alpha = 0.90$).

4.2.2. Political ideology

As in Study 1, we measured political ideology with two 9-point items asking participants to position themselves on a progressive-conservative,⁶ as well as left-right dimension. The items were highly correlated ($r = 0.70$), and thus collapsed into one average score.

⁶ Due to an oversight, for the first 10 participants that started the study, the scale anchors were reversed (1 = *conservative*, 9 = *progressive*). After inspection, we decided that these responses can be used, due to their matching with the left/right question (i.e., if participants were above the mean on one, they were below the mean on the other and vice versa). The results do not change in any significant way when these 10 participants are excluded from the analyses.

4.2.3. Political affiliation

In addition to preselecting participants based on party affiliation they indicated when they joined Prolific, we also measured their political affiliation again (“Labour”, “Conservative”, “Other”) to make sure it is up to date with their political preferences at the time of study execution. We used this response, instead of the preselection, to test party affiliation differences.⁷ One hundred fifty-seven participants indicated an affiliation with the Conservative party, 166 indicated affiliation with the Labour party, while 38 did not choose either and was thus excluded from analyses with this variable.

4.2.4. Demographics

As in previous studies, we recorded participants’ age, gender, education (7-point ordinal scale, details are available on OSF), and religiosity (1 = *not religious at all*; 7 = *very religious*). Additionally, we asked participants whether they had any scientific training or not, as well as how knowledgeable they considered themselves on the topic of climate change (on a scale of 1 = *not very knowledgeable* to 7 = *very knowledgeable*). Most participants ($n = 291$) had no scientific training and considered themselves moderately knowledgeable on the topic of climate change ($M = 3.84$, $SD = 1.17$).

4.3. Results and discussion

The correlations shown in Table 5 correspond with the results of Study 1 and were in line with our expectations, with climate scepticism being positively associated with both conservative ideology and affiliation. In addition, conservative ideology was negatively associated with CFC, while the negative correlation between CFC and political affiliation was not significant (possibly because affiliation was a cruder, binary measure). Furthermore, conservative ideology and affiliation were positively correlated with temporal distance to the consequences of climate change. Finally, both temporal variables and climate scepticism also correlated as predicted, with CFC being related to less scepticism, while the opposite was the case for temporal distance.

Next, as in Study 1, we conducted a hierarchical linear regression to test the relative importance of ideology in predicting climate scepticism when CFC and temporal distance to climate change consequences are introduced as additional predictors. In addition to controlling for demographic factors, we also controlled for climate change mitigation threat in these analyses. Results shown in Table 6 are largely consistent with the results from Study 1, with both CFC (Step 3, $Adj. R^2 = 0.31$, $F(7,335) = 22.45$, $p < .001$) and temporal distance to climate change consequences (Step 4, $Adj. R^2 = 0.48$, $F(8,334) = 39.91$, $p < .001$) predicting climate change scepticism over and above political ideology, as well as climate mitigation threat.

Most importantly, although the relative importance of political ideology dropped when climate change mitigation was included in the model (Step 2, $Adj. R^2 = 0.25$, $F(6,336) = 20.11$, $p < .001$), in Step 3 ($Adj. R^2 = 0.31$, $F(7,335) = 22.45$, $p < .001$), CFC did not diminish the relative impact of political ideology (although it was a significant predictor). In contrast, entering temporal distance to climate change as a predictor in Step 4 ($Adj. R^2 = 0.48$, $F(8,334) = 39.91$, $p < .001$) resulted in a substantially lower predictive power of political ideology. Together these results suggest that both the perceived economic implications of climate change (i.e., climate change mitigation threat) and temporal distance to climate change consequences contribute to the ideological gap in climate change beliefs.

Again, in line with results from Study 1, it is interesting to note that the predictive power of CFC was diminished after introducing temporal distance to climate change in the final model, once more suggesting that

⁷ No substantial or meaningful changes in any of the results were identified when using the preselection variable instead of political affiliation reported in the study.

general CFC could contribute to climate change scepticism by pushing away climate consequences in time.

Finally, to quantify the reduction in the predictive power of political ideology after accounting for temporal variables more precisely, we used parallel mediation analysis. This was done using the PROCESS macro (Model 4, version 3.4; Hayes, 2013) for SPSS (version 26). Similarly to Study 1, the direct relationship of political ideology and climate scepticism was smaller, although still statistically significant. Furthermore, 95% bootstrapped confidence intervals for the total indirect effect—as well as the indirect effect for temporal distance—did not contain zero, echoing results from the hierarchical regression and suggesting temporal distance accounted for a significant part of the covariance between political ideology and climate scepticism. Next, also in line with the hierarchical regression results, the indirect effect of CFC was not statistically significant. Details of the analyses can be found in Appendix A (Figure A.3; Table A.3).

In sum, the results of Study 2 confirmed that conservative political orientation is related to lower CFC and higher temporal distance towards climate change consequences. Furthermore, both of these tendencies were associated with higher scepticism about climate change. We also found support for the notion that these differing time perceptions—namely temporal distance to climate change consequences—can partly account for the ideological gap in climate change attitudes, though this was not the case for CFC.

In sum, Study 2 largely confirmed the findings obtained in Study 1 in a different country, which speaks to their generalisability and robustness. We also conducted the same regression analyses with political affiliation instead of ideology. Results yielded the same conclusions and are presented in Appendix B (Table B.1).

4.3.1. Additional analyses

With the aim of increasing comparability to Study 1, apart from temporal distance, we also measured other dimensions of psychological distance to climate change—social, spatial and hypothetical distance (Jones et al., 2017). Given that the last one refers to the uncertainty with which the consequences of climate change are perceived, it is conceptually similar to scepticism about climate change. We, therefore, as in Study 1, conducted a hierarchical regression with identical steps as in the main analyses, replacing climate change scepticism with uncertainty as the dependent variable. The analysis yielded identical conclusions and can be found here: <https://osf.io/tcax6/>.

5. General discussion

A growing body of literature indicates that the relationship between political conservatism and climate change scepticism is a robust one (e.g., Hornsey et al., 2018; Rutjens et al., 2021). However, it is far less clear what the psychological underpinnings of this relationship are. In the present research, we aimed at expanding the understanding of individual difference factors that contribute to conservatives being less convinced anthropogenic climate change is happening. We focused on CFC and temporal distance to climate change consequences as potential contributors to this ideological gap. Across three studies and two countries—the Netherlands and the UK—we obtained support for our predictions that conservatives score lower on CFC and report higher temporal distance to climate change effects. Next, we identified that individuals with lower CFC are more sceptical of the very existence of climate change. Finally, through comparing the relative contributions of individual predictors in hierarchical regressions, as well as mediation analyses, we obtained evidence that temporal distance to climate change (Study 1 and Study 2), and, to a lesser extent, CFC (Pilot study and Study 1, but not Study 2) play a role in the relationship between ideology and climate change scepticism.

As for CFC, our findings replicate previous work linking the construct to less scepticism about climate change (Joireman & Liu, 2014; Wang et al., 2019), and are also in line with lower CFC being related to less

Table 5
Means, standard deviations and zero-order correlations, Study 2.

	1.	2.	3.	4.	5.	M	SD
1. Climate scepticism	–					2.11	.74
2. CFC	-.34***	–				3.5	.52
3. Temporal distance to climate change	.60***	-.35***	–			2.13	.92
4. Conservative ideology	.39***	-.14**	.29***	–		4.44	1.8
5. Conservative affiliation ¹	.32***	-.08	.25***	.76***	–	.49	.50
6. Climate mitigation threat	.40***	-.18***	.27***	.28***	.19***	3.59	.99

Note. ¹ as opposed to Labour party affiliation. CFC = Consideration of future consequences.

All Ns = 351.

p < .01, *p < .001.

pro-environmental attitudes and behaviours (Beiser-McGrath & Huber, 2018; Milfont et al., 2012; Zhu et al., 2020). Furthermore, our findings that less CFC is related to conservative political ideology in the Netherlands and the UK replicate previous work from the US (Joireman & Liu, 2014). This result also corroborates findings from linguistic analyses (Robinson et al., 2015), as well as a recent study from China, in which conservatives agreed more with past-than future-focused statements, and also conceptualized the past as spatially in front of them, while the opposite was true for liberals (Li & Cao, 2020). It is possible that this relationship between less future orientation and conservatism could be attributed to conservatives' greater aversion to uncertainty (Caprara et al., 2006), and/or holding tradition and times past at higher value (Jost et al., 2008), which could be interesting avenues for future research. It would also be informative to assess whether preference for past times might be rooted in nostalgia, characteristic for conservative values, whereas disregarding the future consequences stems from uncertainty aversion. Nevertheless, our findings imply these under-examined tendencies can have implications for climate change beliefs—such that less orientation towards the future can be partially responsible for stronger climate change scepticism among conservatives. However, it is important to note that even though we consistently found bivariate correlations of CFC with both political ideology and climate scepticism, the indirect effect of political ideology on climate scepticism through CFC was modest in magnitude, and not registered consistently across all studies. Therefore, more research is needed to establish with greater certainty whether CFC is a partial reason for the ideological gap in climate change beliefs.

Besides domain-general CFC, we identified higher temporal distance to climate change consequences as a predictor of climate change scepticism, in line with previous work (e.g., Singh et al., 2017; Spence et al., 2012; Wang et al., 2019). We also found that conservatives consistently perceived climate change consequences as more distant in time, echoing links between conservatism and lower climate change worry and risk perception (e.g., McCright et al., 2016b). While CFC is a general individual difference variable, higher temporal distance to climate change in conservatives could, in part, be seen as a component of motivated cognition. In other words, the inconvenience climate change poses to the conservative worldview might also cause these individuals to “push away” its consequences further into the future so to minimize its importance.

When comparing the magnitude of associations of CFC and temporal distance to climate consequences with climate change scepticism and political ideology, it is evident that associations of CFC with these variables were notably lower. However, it is important to bear in mind that the latter is a domain-specific measure, while the first is a general individual differences indicator, with no content overlap with the highly politicised topic of climate scepticism. Such a general tendency was appropriate for our investigation of reasons why conservatives might be more sceptical of climate change. However, future research could further scrutinize the magnitude of the relationships between CFC on the one hand, and climate-related and ideological variables on the other hand, by employing a domain-specific version of the CFC scale which taps into CFC in the domain of environmental behaviour (Murphy et al., 2020).

Looking at the temporal aspect of motivated cognition together with the more general tendency to disregard future consequences, our results also suggest their interplay. Since the relative contribution of general CFC was diminished in both Studies 1 and 2 after accounting for temporal distance to climate change consequences, this suggests that less CFC, in general, might contribute to climate change scepticism through perceiving climate change as more temporally remote. In other words, individuals who are less focused on the future can “afford” to be more sceptical of the very reality of climate change partly because they don't perceive it as consequential for the present moment.

Furthermore, our results also additionally corroborate the notion that motivated cognition plays a role in the relationship between ideology and climate change beliefs (Jacquet et al., 2014). In Study 2, in line with previous work (Clarke et al., 2019), we identified climate change mitigation threat as a significant predictor of climate change scepticism, which substantially reduced the relative contribution of ideology. This suggests that perceiving the actions needed to mitigate the impacts of climate change as threatening for the societal system is an important barrier for conservatives accepting the reality of it. Put differently, though it seems that there are some psychological tendencies simply more characteristic of conservatives which also make them more sceptical of climate change (such as less CFC), there is little doubt that conservative people also adopt certain attitudes about policy implications of climate change that produce the same effect.

Finally, our findings have implications for climate change communication efforts aimed at bridging the ideological gap. Political ideology is a relatively stable characteristic and therefore resistant to change. Thus, it is imperative to find avenues that can bring climate change issues closer to conservatives by framing them in a way that will make them more salient and relevant for these individuals. Our results point to potential avenues for achieving this goal. First, finding ways to increase future thinking (e.g., through writing letters to future generations; see Shrum, 2021) in general before communicating about climate change might make conservatives' less sceptical of it. Second, simply focusing on the present instead of future consequences could help reduce the ideological gap in climate change beliefs. In other words, even without any temporal comparisons, emphasizing current impacts (e.g., forest fires, extreme weather) and refraining from mentioning (distant) future scenarios has the potential to, at least partly, bridge the ideological gap in climate change beliefs.

5.1. Limitations

The present work has several limitations which could also serve as guidelines for future studies. First, we focused on beliefs about climate change, as opposed to behavioural intentions or support for specific climate mitigation policies. Given the well-known gap between attitudes and behaviour, future research would benefit from investigating the effect of time preferences on the relationship between ideology and such constructs.

Second, due to the correlational nature of our work, it is not possible to draw causal conclusions about relations between political ideology and temporal variables. For instance, while we focused on CFC as a

Table 6
Hierarchical regression, predicting climate change scepticism, Study 2.

	Step 1				Step 2				Step 3				Step 4				
	B	95% CI	P	Part r	β	95% CI	P	Part r	β	95% CI	P	Part r	β	95% CI	P	Part r	
Age	.12	.01	.22	.027	.12	.04	.24	.005	.13	.04	.22	.007	.13	.05	.21	.002	.12
Gender (female)	.002	-.10	.10	.968	.002	-.11	.08	0.792	-.01	-.10	.09	.924	-.004	-.06	.10	.603	.02
Education	-.08	-.18	.02	.113	-.08	-.16	.03	.190	-.06	.13	.05	.421	-.04	-.15	.01	.093	-.07
Religiosity	.02	-.08	.11	.763	.02	-.10	.09	.926	-.004	-.10	.08	.770	-.01	-.11	.05	.446	-.03
Conservative ideology	.35	.24	.45	<.001	.33	.14	.35	<.001	.22	.14	.33	<.001	.21	.06	.24	<.001	.13
Climate change mitigation threat	—	—	—	—	.32	.22	.42	<.001	.30	.18	.37	<.001	.26	.11	.28	<.001	.18
CFC	—	—	—	—	—	—	—	—	—	-.24	.15	<.001	-.24	-.20	.03	.008	.10
Temporal distance	—	—	—	—	—	—	—	—	—	—	—	—	—	.38	.55	<.001	.50
Adj. R ²	.16 (p < .001)				.25 (p < .001)				.31 (p < .001)				.48 (p < .001)				
ΔR ²	—				.09 (p < .001)				.05 (p < .001)				.17 (p < .001)				

Note. CFC = Consideration of future consequences. Part r = semi-partial r. N = 343, due to 8 incomplete cases (including those who chose gender identities that were not frequent enough in the sample to analyse).

potential explanation for the ideological gap in climate change beliefs, other correlational work conceptualized CFC as an antecedent of political ideology (Joireman & Liu, 2014), although this causal path was not statistically significant. Therefore, experimental work is needed to investigate the direction of influence between political ideology and temporal variables.

Third, the correlational nature of our work also invites experimental tests of the effects of the temporal aspects of climate change messaging on the ideological bias in climate change beliefs. However, in light of recent unsuccessful attempts to replicate the findings by Baldwin and Lammers (2016) that past temporal comparisons (as opposed to future ones) increase conservatives' pro-environmental attitudes (Kim et al., 2021; Stanley et al., 2021), gaining a more nuanced understanding of individual differences is needed before employing experimental designs. Whilst our study is a step in this direction, more work is needed to gauge the likely complex interplay that different cognitive, affective and motivational characteristics related to ideology might have on climate change beliefs.

Finally, ideological polarization of climate change beliefs and attitudes is most pronounced in the US and other highly carbon-dependent countries (Hornsey et al., 2018). Our work did not include these populations, for which the tested associations and their practical implications might be most relevant. Therefore, we encourage scrutinising these results in such contexts.

6. Conclusion

Given the urgency of the issue (Intergovernmental Panel on Climate Change, 2021), it is imperative to increase understanding of the factors that contribute to scepticism about climate change. We show that the link between conservatism and climate change scepticism could be partly explained through time-related variables. More specifically, conservatives' lesser consideration on future consequences, and, particularly perception of climate change as irrelevant for the present moment, can, to an extent, account for this relationship. Our results provide guidelines for research on climate communication aimed at reducing scepticism about climate change.

Author note

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Ethics approval

ERB approval for all studies was obtained at the authors' university.

Data availability

Datasets from all three studies are available on OSF: <https://osf.io/42p6d/>.

Author statement

Bojana Večkalov: Conceptualisation, Methodology, Formal analysis, Writing – original draft, Writing – review & editing, Natalia Zarzeczna: Writing – review & editing; Conceptualisation, Esther Niehoff: Writing – review & editing, Jonathon McPhetres: Writing – review & editing, Conceptualisation, Bastiaan T. Rutjens: Conceptualisation,

¹ Both studies in the Netherlands had a broader scope than reported in this paper, testing various predictors of climate change scepticism, as well as scepticism towards artificial intelligence and genetically modified foods (Study 1). The UK study was entirely confirmatory and reported in this paper in full.

Appendix A

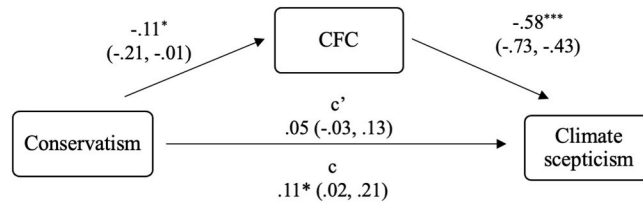


Fig. A.1. Mediation analysis, Pilot

Note. Unstandardised path estimates. Age, gender, education and religiosity were included in the analysis as covariates. CFC = consideration of future consequences. *p < .05; ***p < .001.

Table A.1
Indirect effects, Pilot Study

Indirect effect	B (SE)	BCa 95% CI
CFC	.06 (.03)	-.001, .15

Note. 5000 bootstrapped samples. BCa 95% CI = bias-corrected and accelerated (BCa) bootstrapping. Confidence intervals (CI). Effects are considered significant if these do not contain zero⁸.

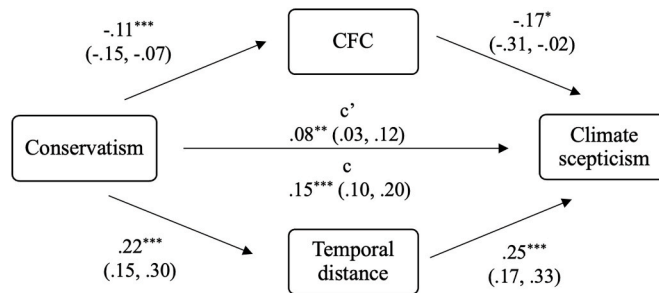


Fig. A.2. Mediation, Study 1

Note. Unstandardised path estimates for mediation analysis. Age, gender, education and religiosity were included in the analysis as covariates. CFC = consideration of future consequences. *p < .05; **p < .01; ***p < .001.

Table A.2
Simple mediation indirect effects, Study 1

Indirect effect	B (SE)	BCa 95% CI
Total	.07 (.02)	.05, .11
CFC	.02 (.01)	.002, .03
Temporal distance to CC	.06 (.01)	.03, .08

Note. 5000 bootstrapped samples. BCa 95% CI = bias-corrected and accelerated (BCa) bootstrapping confidence intervals (CI), effects are considered significant if these do not contain zero.

⁸ Taking Figure A1 into consideration—which shows that the total effect (not accounting for mediators) was significant, unlike the direct effect (accounting for mediators) of political ideology on CC scepticism—we presume the lower level CI slightly going below zero is likely due to the fact that the Pilot study was underpowered and the imperfection of the measurement.

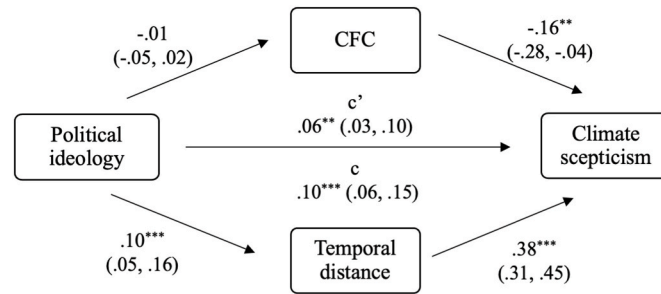


Fig. A.3. Mediation, Study 2

Note. Unstandardised path estimates for mediation analysis. Age, gender, education and religiosity were included in the analysis as covariates. CFC = consideration of future consequences.

p < .01; *p < .001.

Table A.3
Simple mediation indirect effects, Study 2

Indirect effect	B (SE)	BCa 95% CI
Total	.04 (.01)	.02, .08
CFC	.002 (.003)	-.004, .01
Temporal distance to CC	.04 (.01)	.02, .07

Note. 5000 bootstrapped samples. BCa 95% CI = bias-corrected and accelerated (BCa) bootstrapping confidence intervals (CI), effects are considered significant if these do not contain zero.

Appendix B

Table B.1

Hierarchical regression with political affiliation, Study 2.

	Step 1				Step 2				Step 3				Step 4							
	β	95% CI	p	Partial r	β	95% CI	p	Partial r	β	95% CI	p	Partial r	β	95% CI	p	Partial r				
Age	.14	.03	.25	.015	.14	.15	.05	.26	<.001	.17	.14	.04	.24	.006	.16	.13	.05	.22	<.001	.17
Gender (female)	.02	-.09	.12	.774	.002	-.01	-.11	.10	.003	-.006	.00	-.09	.10	.958	.003	.02	-.06	.10	.002	.03
Education	-.10	-.21	.00	.058	-.11	-.09	-.19	.01	.920	-.10	-.06	-.16	.03	.194	-.08	-.07	-.16	.01	.616	-.10
Religiousness	.05	-.06	.15	.369	.05	.01	-.09	.11	.077	.01	-.00	-.10	.09	.957	-.003	-.03	-.11	.05	.081	-.04
Conservative political affiliation	.28	.17	.39	<.001	.27	.20	.09	.31	.866	.21	.20	.10	.30	<.001	.22	.12	.03	.21	.463	.15
CC mitigation threat	-	-	-	-	-	.36	.26	.46	<.001	.38	.32	.23	.42	<.001	.35	.21	.12	.29	.009	.26
CFC	-	-	-	-	-	-	-	-	-	-	-.24	-.33	-.14	<.001	-.27	-.11	-.20	-.02	<.001	-.14
Temporal distance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.48	.39	.57	.013	.51	
Adj. R ²	.12***				.25***				.30***				.48***							
ΔR ²	-				.12***				.05***				.18***							

Note. N = 311. CC = climate change. CFC = consideration of future consequences.

***p < .001

References

Baldwin, M., & Lammers, J. (2016). Past-focused environmental comparisons promote proenvironmental outcomes for conservatives. *Proceedings of the National Academy of Sciences*, 113(52), 14953. <https://doi.org/10.1073/pnas.1610834113>. LP – 14957.

Bashir, N. Y., Wilson, A. E., Lockwood, P., Chasteen, A. L., & Alisat, S. (2014). The time for action is now: Subjective temporal proximity enhances pursuit of remote-future goals. *Social Cognition*, 32(1), 83–93. <https://doi.org/10.1521/soco.2014.32.1.83>

Beiser-McGrath, L. F., & Huber, R. A. (2018). Assessing the relative importance of psychological and demographic factors for predicting climate and environmental attitudes. *Climatic Change*, 149(3), 335–347. <https://doi.org/10.1007/s10584-018-2260-9>

Brügger, A. (2020). Understanding the psychological distance of climate change: The limitations of construal level theory and suggestions for alternative theoretical perspectives. *Global Environmental Change*, 60. <https://doi.org/10.1016/j.gloenvcha.2019.102023>

Campbell, T. H., & Kay, A. C. (2014). Solution aversion: On the relation between ideology and motivated disbelief. *Journal of Personality and Social Psychology*, 107(5), 809–824. <https://doi.org/10.1037/a0037963>

Caprara, G. V., Schwartz, S., Capanna, C., Vecchione, M., & Barbaranelli, C. (2006). Personality and politics: Values, traits, and political choice. *Political Psychology*, 27(1), 1–28. <https://doi.org/10.1111/j.1467-9221.2006.00447.x>

Clarke, E. J. R., Ling, M., Kothe, E. J., Klas, A., & Richardson, B. (2019). Mitigation system threat partially mediates the effects of right-wing ideologies on climate change beliefs. *Journal of Applied Social Psychology*, 49(6), 349–360. <https://doi.org/10.1111/jasp.12585>

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149–1160. <https://doi.org/10.3758/brm.41.4.1149>

Feygina, I., Jost, J. T., & Goldsmith, R. E. (2010). System justification, the denial of global warming, and the possibility of “System-Sanctioned Change. *Personality and Social Psychology Bulletin*, 36(3), 326–338. <https://doi.org/10.1177/0146167209351435>

Figueredo, A. J., Vásquez, G., Brumbach, B. H., Schneider, S. M. R., Sefcek, J. A., Tal, I. R., Hill, D., Wenner, C. J., & Jacobs, W. J. (2006). Consilience and life history theory: From genes to brain to reproductive strategy. *Developmental Review*, 26(2), 243–275. <https://doi.org/10.1016/j.dr.2006.02.002>

Figueredo, A. J., Vásquez, G., Brumbach, B. H., Sefcek, J. A., Kirsner, B. R., & Jacobs, W. J. (2005). The K-factor: Individual differences in life history strategy. *Personality and Individual Differences*, 39(8), 1349–1360. <https://doi.org/10.1016/j.paid.2005.06.009>

Häkkinen, K., & Akrami, N. (2014). Ideology and climate change denial. *Personality and Individual Differences*, 70, 62–65. <https://doi.org/10.1016/j.paid.2014.06.030>

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.

- Hornsey, M. J., Harris, E. A., Bain, P. G., & Fielding, K. S. (2016). Meta-analyses of the determinants and outcomes of belief in climate change. *Nature Climate Change*, 6(6), 622–626. <https://doi.org/10.1038/nclimate2943>
- Hornsey, M. J., Harris, E. A., & Fielding, K. S. (2018). Relationships among conspiratorial beliefs, conservatism and climate scepticism across nations. *Nature Climate Change*, 8(7), 614–620. <https://doi.org/10.1038/s41558-018-0157-2>
- Hu, S., Jia, X., Zhang, X., Zheng, X., & Zhu, J. (2017). How political ideology affects climate perception: Moderation effects of time orientation and knowledge. *Resources, Conservation and Recycling*, 127, 124–131. <https://doi.org/10.1016/j.resconrec.2017.09.003>
- Intergovernmental Panel on Climate Change. (2021). Summary for policymakers. In V. Masson-Delmotte, P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, & B. Zhou (Eds.), *Climate change 2021: The physical science basis. Contribution of working group I to the sixth assessment Report of the intergovernmental Panel on climate change*. Cambridge University Press. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf.
- Jacquet, J., Dietrich, M., & Jost, J. T. (2014). The ideological divide and climate change opinion: “top-down” and “bottom-up” approaches. *Frontiers in Psychology*, 5, 1458. <https://doi.org/10.3389/fpsyg.2014.01458>
- Joireman, J., & Liu, R. L. (2014). Future-oriented women will pay to reduce global warming: Mediation via political orientation, environmental values, and belief in global warming. *Journal of Environmental Psychology*, 40, 391–400. <https://doi.org/10.1016/j.jenvp.2014.09.005>
- Jones, C., Hine, D. W., & Marks, A. D. G. (2017). The future is now: Reducing psychological distance to increase public engagement with climate change. *Risk Analysis*, 37(2), 331–341. <https://doi.org/10.1111/risa.12601>
- Jost, J. T., Nosek, B. A., & Gosling, S. D. (2008). Ideology: Its resurgence in social, personality, and political psychology. *Perspectives on Psychological Science*, 3(2), 126–136. <https://doi.org/10.1111/j.1745-6916.2008.00070.x>
- Jylhä, K. M., & Akrami, N. (2015). Social dominance orientation and climate change denial: The role of dominance and system justification. *Personality and Individual Differences*, 86, 108–111. <https://doi.org/10.1016/j.paid.2015.05.041>
- Kim, I., Hammond, M. D., & Milfont, T. L. (2021). Do past-focused environmental messages promote pro-environmentalism to conservatives? A pre-registered replication. *Journal of Environmental Psychology*, 73, 101547. <https://doi.org/10.1016/j.jenvp.2020.101547>
- Lewandowsky, S., Gignac, G. E., & Oberauer, K. (2013). The role of conspiracist ideation and worldviews in predicting rejection of science. *PLoS ONE*, 8(10), e75637. <https://doi.org/10.1371/journal.pone.0075637>
- Li, H., & Cao, Y. (2020). Time for politics: The relationship between political attitude and implicit space-time mappings. *Current Psychology*. <https://doi.org/10.1007/s12144-020-00640-4>
- Manríquez-Betanzos, J. C., Corral-Verdugo, V., Tapia-Fonllem, C. O., & Fraijo-Sing, B. S. (2018). Sustainable behavior, life history strategy, and positive time perspective: A structural model. *Evolutionary Behavioral Sciences*, 12(4), 245–262. <https://doi.org/10.1037/ebbs0000149>
- McCright, A. M., Dunlap, R. E., & Marquart-Pyatt, S. T. (2016a). Political ideology and views about climate change in the European Union. *Environmental Politics*, 25(2), 338–358. <https://doi.org/10.1080/09644016.2015.1090371>
- McCright, A. M., Marquart-Pyatt, S. T., Shwom, R. L., Brechin, S. R., & Allen, S. (2016b). Ideology, capitalism, and climate: Explaining public views about climate change in the United States. *Energy Research & Social Science*, 21, 180–189. <https://doi.org/10.1016/j.erss.2016.08.003>
- McDonald, R. I., Chai, H. Y., & Newell, B. R. (2015). Personal experience and the ‘psychological distance’ of climate change: An integrative review. *Journal of Environmental Psychology*, 44, 109–118. <https://doi.org/10.1016/j.jenvp.2015.10.003>
- Milfont, T. L., Wilson, J., & Diniz, P. (2012). Time perspective and environmental engagement: A meta-analysis. *International Journal of Psychology*, 47(5), 325–334. <https://doi.org/10.1080/00207594.2011.647029>
- Murphy, L., Cadogan, E., & Dockray, S. (2020). The consideration of future consequences: Evidence for domain specificity across five life domains. *Personality and Social Psychology Bulletin*, 46(5), 663–678. <https://doi.org/10.1177/0146167219873478>
- Poortinga, W., Fisher, S., Böhm, G., Steg, L., Whitmarsh, L., & Ogunbode, C. (2018). *European attitudes to climate change and energy: Topline results from Round 8 of the European Social Survey*. London: European Social Survey ERIC.
- Robinson, M. D., Cassidy, D. M., Boyd, R. L., & Fetterman, A. K. (2015). The politics of time: Conservatives differentially reference the past and liberals differentially reference the future. *Journal of Applied Social Psychology*, 45(7), 391–399. <https://doi.org/10.1111/jasp.12306>
- Rutjens, B. T., Sengupta, N., van der Lee, R., van Koningsbruggen, G. M., Martens, J. P., Rabelo, A., & Sutton, R. M. (2021). Science skepticism across 24 countries. *Social Psychological and Personality Science*. <https://doi.org/10.1177/19485506211001329>, 194855062110013.
- Rutjens, B. T., Sutton, R. M., & van der Lee, R. (2018). Not all skepticism is equal: Exploring the ideological antecedents of science acceptance and rejection. *Personality and Social Psychology Bulletin*, 44(3), 384–405. <https://doi.org/10.1177/0146167217741314>
- Rutjens, B. T., & van der Lee, R. (2020). Spiritual skepticism? Heterogeneous science skepticism in The Netherlands. *Public Understanding of Science*, 29(3), 335–352. <https://doi.org/10.1177/0963662520908534>
- Shipp, A. J., Edwards, J. R., & Lambert, L. S. (2009). Conceptualization and measurement of temporal focus: The subjective experience of the past, present, and future. *Organizational Behavior and Human Decision Processes*, 110(1), 1–22. <https://doi.org/10.1016/j.obhdp.2009.05.001>
- Shrum, T. R. (2021). The salience of future impacts and the willingness to pay for climate change mitigation: An experiment in intergenerational framing. *Climatic Change*, 165(1), 18. <https://doi.org/10.1007/s10584-021-03002-6>
- Singh, A., Zwicke, A., Bruskotter, J., & Wilson, R. (2017). The perceived psychological distance of climate change impacts and its influence on support for adaptation policy. *Environmental Science & Policy*, 73, 93–99. <https://doi.org/10.1016/j.envsci.2017.04.011>
- Spence, A., Poortinga, W., & Pidgeon, N. (2012). The psychological distance of climate change. *Risk Analysis*, 32(6), 957–972. <https://doi.org/10.1111/j.1539-6924.2011.01695.x>
- Stanley, S. K., Klas, A., Clarke, E. J. R., & Walker, I. (2021). The effects of a temporal framing manipulation on environmentalism: A replication and extension. *PLoS One*, 16(2), Article e0246058. <https://doi.org/10.1371/journal.pone.0246058>
- Sterling, J., Jost, J. T., & Bonneau, R. (2020). Political psycholinguistics: A comprehensive analysis of the language habits of liberal and conservative social media users. *Journal of Personality and Social Psychology*, 118(4), 805–834. <https://doi.org/10.1037/pspp0000275>
- Strathman, A., Gleicher, F., Boninger, D. S., & Edwards, C. S. (1994). The consideration of future consequences: Weighing immediate and distant outcomes of behavior. *Journal of Personality and Social Psychology*, 66(4), 742–752. <https://doi.org/10.1037/0022-3514.66.4.742>
- Trope, Y., & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological Review*, 117(2), 440–463. <https://doi.org/10.1037/a0018963>
- Wang, S., Hurlstone, M. J., Leviston, Z., Walker, I., & Lawrence, C. (2019). Climate change from a distance: An analysis of construal level and psychological distance from climate change. *Frontiers in Psychology*, 10, 230. <https://doi.org/10.3389/fpsyg.2019.00230>, 230.
- Zhu, J., Hu, S., Wang, J., & Zheng, X. (2020). Future orientation promotes climate concern and mitigation. *Journal of Cleaner Production*, 262, 121212. <https://doi.org/10.1016/j.jclepro.2020.121212>