Moral Bandwidth and Environmental Concerns during a Public Health Crisis: Evidence from Germany

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Abstract

Did the COVID-19 pandemic crowd out environmental concerns, as one might expect if "pools of worry" were finite or "moral bandwidth" was limited? We use Chancellor Angela Merkel's address to the German nation on 18 March 2020 as the threshold in a regression discontinuity in time (RDiT) to evaluate the effects of an increase in COVID-based economic and health concerns on the climate and environmental concerns of respondents to the German Socio-Economic Panel (SOEP). We find no evidence of crowding out – there is even some indication that environmental concerns increased, especially on the intensive margin – and show that this result survives various robustness checks. We also share some evidence that the treatment effects are heterogeneous: the concerns of older and more patient Germans, as well as those who report more

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social trust, increased relative to other groups. This is consistent with the absence of bandwidth constraints, but other interpretations – hierarchical or complementary concerns, for example – are also possible.
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JEL codes: Q5, H8

1 Introduction

Even as the global climate crisis continues to worsen, Carlsson et al. (2021) have described the 2010s as the "climate decade," one marked both by changing attitudes and increased willingness-to-pay for climate policies.[1] By the end of the decade, however, the United Nations Secretary General Antonio Guterres would warn that the COVID-19 pandemic should not displace the "deeper environmental emergency" (Heath, 2020).

There was (non-causal) reason for optimism: a Pew Foundation survey (Pew Research Center, 2020) released in the summer of 2020 found that in many countries, residents were about more or less equally concerned about global warming and pandemics, and that concern about the former had not wavered. Similarly, Krosnick and MacInnis (2020) found that COVID-19 pandemic had not decreased Americans' belief in climate change or its threat: the percentage who believed climate change would be a serious problem for the United States and the world did not change remained more or less constant between 2018 and 2000, at about 82%.

On the other hand, there is concern that the increased politicization of science during the pandemic weakened public trust across issues (Cross, 2021). Further, there is some evidence that climate concern is "elastic" with respect to economic conditions and anxieties: Kahn and Kotchen (2011), for example, found that in the United States, belief in global warming and support for climate mitigation policies have been inversely related to local unemployment, a conclusion echoed in the work of Meyer (2022) on the effects of the Great Recession. In other recent work, Fetzer et al. (2020) exploited the variation in beliefs about pandemic risk to estimate substantial causal effects on economic anxieties of the sort associated with, say, increased joblessness.

Narratives like these are consistent with the existence of some fixed "moral bandwidth" or, to invoke the term introduced in Weber (2006), a "finite pool of worry" which can cause environmental concerns to be crowded out. Our own results, based on the German Socio-Economic Panel (SOEP) (Goebel et al., 2019), confirm that while the pandemic caused

[1]The newly released IPCC Synthesis Report of the Sixth Assessment Report warns "There is a rapidly closing window of opportunity to secure a livable and sustainable future for all (*very high confidence*)" (IPCC, 2023).

Germans to become more concerned about economic and health matters, concerns about the climate and environment were not less acute. Indeed, our evidence suggests that, at least for some time, there was *more* concern about climate change and the environment, at least on the intensive margin. Our results therefore challenge simple versions of this framework and, given the breadth and dept of COVID-19 concerns during this time, one might anticipate that other shocks will not crowd out climate or environmental concerns either.

To do this, we exploit a regression discontinuity in time (RDiT) design to generate what we believe is a robust causal estimate of the pandemic's effects on climate concerns, and find no evidence of limited moral bandwidth. Our work has two immediate antecedents. First, Evensen et al. (2021) asked a panel of almost 2,000 UK residents in April 2019 and June 2020 about both the seriousness of climate change and the threat it posed relative to COVID-19, and found little or no evidence of a finite pool of worry. And second, Berazneva et al. (2023) performed a similar exercise for a small sample of college students in the US, and supplemented this with an information provision experiment on state-level health and economic conditions for a broader population of young Americans, with similar results.

2 Moral bandwidth and the German experience with COVID-19

Economists have devoted considerable attention to the adverse consequences of some shocks on "cognitive bandwidth" (see, for example, Dean et al. (2018)), and there is now evidence that COVID-19 was one of those (Bogliacino et al., 2021). Weber (2006) and Sisco et al. (2020) have argued, however, that it is not just "pools of attention" that are finite, but also "pools of worry." Viewed from this perspective, whatever the effects of COVID-related economic and health concerns on decision-making, other concerns, not least those about climate and the environment, might also be displaced.

The hypothesis that the pandemic has crowded out environmental and climate concerns would seem to run afoul of recent cross-sectional surveys which show that, at least in the United States, such concerns remain robust (Krosnick and MacInnis, 2020; Leiserowitz et al., 2021). In a similar vein, Evensen et al. (2021) and Berazneva et al. (2023), mentioned in the

introduction, find little or no evidence of crowding out in two quite different panels.

A more nuanced interpretation of the finite pool of worry framework, however, would allow for the existence of a hierarchy of concerns, such that a shock (first) crowds out other, non-environmental, concerns first. It might also allow for "complementary worries" that cannot displace one another. It follows that our main result – the maintenance, even enhancement, of climate- and environment-related concerns, in the midst of the pandemic – qualifies, but does not invalidate, this framework.

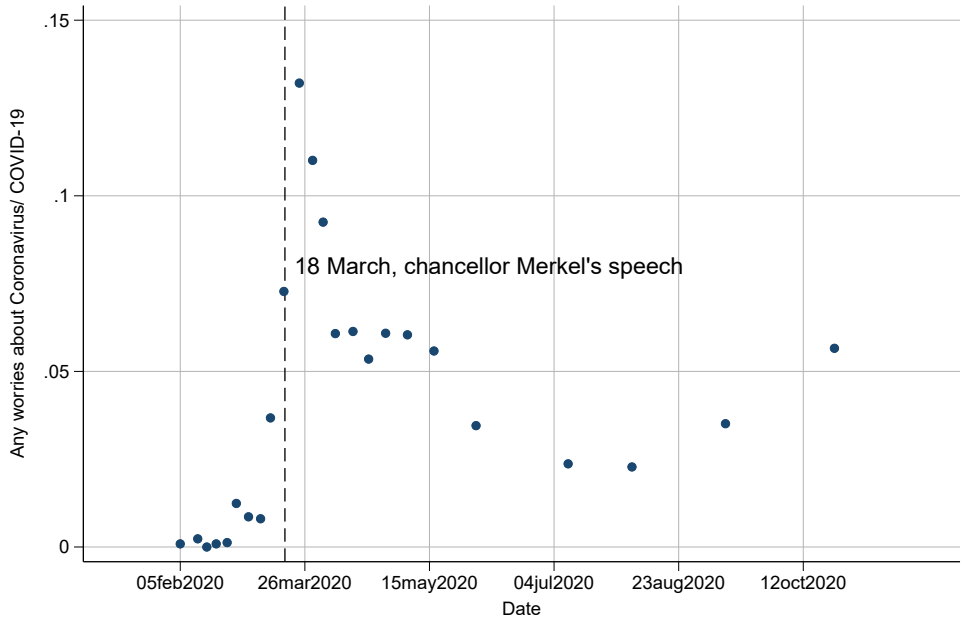
Our results might also be viewed within a framework that emphasized the effects of the pandemic on individual risk and time preferences and the consequences of these for climate concerns. We are cautious about such an approach, because the empirical evidence on preferences and climate concerns is surprisingly weak (Lades et al. (2021), for example) and, no less important, there is at best mixed evidence (Graeber et al., 2020) on the effects of COVID-19 on the risk preferences of Germans.

Our focus in this paper is the German experience with the pandemic and, in particular, Chancellor Angela Merkel's first extraordinary (that is, apart from regular New Years addresses) televised address to the nation on 18 March 2020. The first case of COVID-19 in Germany was recorded on 27 January 2020, and while the initial breakout was contained, subsequent clusters soon emerged all over the country. Within weeks, COVID-19 spread all over Germany. As shown in Figure A.1 in the appendix, the number of cases increased quickly until it peaked on 4 April, about 16 days after Merkel's address. On 4 April 2020, the seven day incidence per 100,000 inhabitants was about 44.48.

The speech prepared the German population for the challenges associated with the COVID-19 pandemic that lay ahead. It was also interpreted as a last call before the federal government and the 16 states implemented far reaching interventions to slow down the spread of COVID-19.[2] The language of the address was historic, even transformational: "This is serious. Take it seriously. Since German unification – no, since the Second World War – no challenge to our nation has ever demanded such a degree of common and united action." Perhaps, not surprisingly, the Germans' concerns about COVID-19/Coronavirus,

[2]The English translation of the address can be found at https://www.bundesregierung.de/breg-de/themen/coronavirus/-this-is-a-historic-task-and-it-can-only-be-mastered-if-we-face-it-together–1732476. We note here, however, that the speech did not mention climate or environmental concerns.

Figure 1: Time series of concerns about COVID-19/Coronavirus



Note: The x-axis shows the interview date. The vertical bar indicates the date of chancellor Angela Merkel's televised address to the nation, 18 March 2020. Data source: SOEPv.37eu.

as recorded in the German Socio-Economic Panel (SOEP), immediately increased as can be seen in Figure 1.

3 Data

The German Socio-Economic Panel (SOEP) (Goebel et al., 2019) is uniquely suited for our empirical investigation.[3] The SOEP is a representative panel of households, first administered in 1984, that annually surveys respondents on a wide range of topics such as demographics, labor market history, attitudes and health, among others.

Of particular relevance for our research question, respondents are asked about their concerns over the impacts of climate change and environmental protection, in addition to other concerns – general and personal economic situation, social cohesion, health, immigration, and peace, among several others (the survey question is shown in Figure A.2 in the appendix). Responses to these concern questions are reported on a three-point Likert scale, where 1

[3]We use the SOEP v37. DOI:10.5684/soep.v37eu.

stands "Very concerned," 2 stands for "Somewhat concerned" and 3 stands for "Not concerned at all," but in what follows, we invert the scale so that higher values are associated with increased concern. We also standardize the scale to have mean of zero and standard deviation of one in the control group (i.e., those interviewed prior to Merkel's address). Last, to help disentangle differences at the intensive and extensive margin, we also make use of two additional indicators, one for cases in which individuals are *at least* somewhat concerned, and another for cases in which individuals are very concerned.

To provide evidence in favor of continuity and to explore possible heterogeneities in the effects of Chancellor Merkel's address, we use some additional predetermined variables: gender, age, education, migration background, household size, household illness, mental health, patience and willingness to take risks (WTR). Table A.1 in the appendix displays the summary statistics for our full sample, which is used to determine the optimal bandwidth for our analysis. In all subsequent analyses, we display the effective number of observations in our results tables.[4]

4 Empirical strategy

In order to identify the effect of Merkel's address on Germans' concerns, we compare individuals' concerns just before and after the Chancellor Merkel's address to the nation on 18 March 2020.[5] That is, we estimate the following equation:

$$\begin{aligned} y_{it} = \alpha + \beta I[t \geq 19/03/2020] + \gamma f(t - 19/03/2020) \\ +\delta f(t + 19/03/2020) + \sum_{r=1}^{12} \zeta_r * I[\text{interview mode} = r] + \epsilon_{it}. \end{aligned} \tag{1}$$

Here, we regress individual i's concerns, measured on the interview date t, on an indicator that is equal to one if the individual was interviewed after Merkel's address to the nation and zero otherwise. The estimate of β then reflects the causal estimate of Merkel's address

[4]The number of observations may vary because different specifications, e.g., a quadratic polynomial of the running variable, may demand different bandwidths.

[5]Since the address was televised in the evening, we conjecture that individuals interviewed during the day are part of the control group.

on individuals' concerns. We control for a function f, of size $z \times 1$, where z corresponds to the degree of the polynomial that takes the time to the address as its argument. In our main specification, we focus on a linear trend, i.e., $z = 1$. However, in Section 5.3, we also control for a second order polynomial in the running variable and find that our results are robust. We allow the trend to differ on both sides of the cut-off. The coefficient vectors γ and δ are each of size $1 \times z$. The term ϵ_{it} is an error term, capturing all unobserved factors influencing individuals' concerns. We cluster standard errors on the level of the running variable. All regressions are weighted using triangular kernels. We restrict the bandwidth to 20 days around the address date. In the appendix, we show that our main results are robust to various bandwidth choices.

We also control for pandemic-related modifications in data collection. In general, before COVID, scheduled interviews were either in-person or via telephone. In our data, the two exceptions – "Written Questionnaires without Interviewer [120]" or "Written, By Mail [210]" – constitute about 38% of the sample. To control for this and group-specific permanent differences, we include interview mode fixed effects.

Identification. For β to be consistently estimated, we require individuals' concerns to be a continuous function of the running variable in the absence of the treatment, i.e., the Merkel address (Hahn et al., 2001). We provide suggestive evidence for the validity of the continuity assumption. In Table A.2 in the appendix, we replace our dependent variable in Equation 1 with individuals' predetermined characteristics. As these are predetermined characteristics, we should expect them to be invariant to change in treatment assignment. This is what we see – throughout we find small in magnitude and statistically insignificant coefficients.

We further note that the continuity tests in Table A.2 include individual characteristics like social trust, to assuage concerns that there was a discontinuous change in the civic mindedness of respondents around Merkel's address, and find no evidence of this.[6]

A common threat to identification is sorting in or out of the treatment around the cutoff. Typically, a discontinuity in the empirical probability density function of interview dates is

[6]A reviewer wonders whether there is selection on prosociality. The short answer is that while we are able to report the results for social trust, an allied measure for which there are annual data, the last direct questions about prosociality before the pandemic were asked in 2015.

indicative of strategic sorting (McCrary, 2008). In our application, this McCrary density test is not informative. Fewer interviews are conducted during weekends, which results in systematic discontinuities in the empirical probability density function of interview dates since our treatment takes place in the middle of the week. As a result, the McCrary density test can not rule out the absence of systematic sorting around the cutoff. However, a similar pattern emerges in the other weeks. Figure A.3 in the appendix displays the number of interviews within our bandwidth.

5 Results

5.1 Did Merkel's address achieve its goals?

Because Merkel's address to the nation highlighted the upcoming economic and health challenges, we should expect responses in these domains. Indeed, the speech increased individuals' concerns about the economy in general, about own economic situation, and about own health. Table 1 reports the estimates for equation 1 on concerns in a wide range of domains. We find that concerns about general and own economic situations each increased about 18% of a standard deviation, as displayed in columns (1) and (2) of Panel A. We also find a small, but statistically insignificant, effect of about 7% of a standard deviation for individuals' concerns about their own health, as displayed in column (1) in Panel B. We find no effect, however, on individuals' concerns about social cohesion, immigration, or peace, as might be expected if other non-environmental concerns had been crowded out.

5.2 Main analysis

We first display the impact of Merkel's address to the nation on individual concerns about the impacts of climate change and environmental protection in Figure 2, following best practices outlined in Korting et al. (2023).[7] The markers in Figure 2 correspond to the daily mean of the concerns, measured in standard deviations of the control group, i.e., the individuals who

[7]For example, we use small bins and omit fitted lines that have been found to increase the type I error, overly suggesting discontinuities.

Table 1: Effect on other concerns

	(1)	(2)	(3)
Panel A:	General econ sit.	Own econ sit.	Social cohesion
Interview after 18 March	0.180***	0.183***	0.008
	(0.056)	(0.040)	(0.078)
N	7690	7691	7689
Panel B:	Own health	Immigration	Peace
Interview after 18 March	0.070	0.047	0.003
	(0.043)	(0.053)	(0.050)
N	7682	7681	7687

Notes: Dependent variables are concerns about the economy, own economic situation, social cohesion in society (columns (1), (2), (3) in panel (A)), own health, immigration to Germany, maintaining peace (columns (1), (2), (3) in panel (B)). The estimates are from a regression of the respective raw scale, standardized to be measured in standard deviations of the control group, on an indicator that is equal to one if an individual was interviewed after Angela Merkel's address and a linear trend in the number of days relative to Merkel's address, which is allowed to differ before and after the date of the speech. In all regressions, we control for a full set of interview mode indicators, use a 20 days bandwidth, and apply triangular kernel weights. The standard errors, in parentheses, are clustered on the level of the running variable. A */**/*** next to coefficient indicates significance at the 10/5/1% level.

were interviewed before the address. The vertical dashed line displays the day of Merkel's address on 18 March 2020.

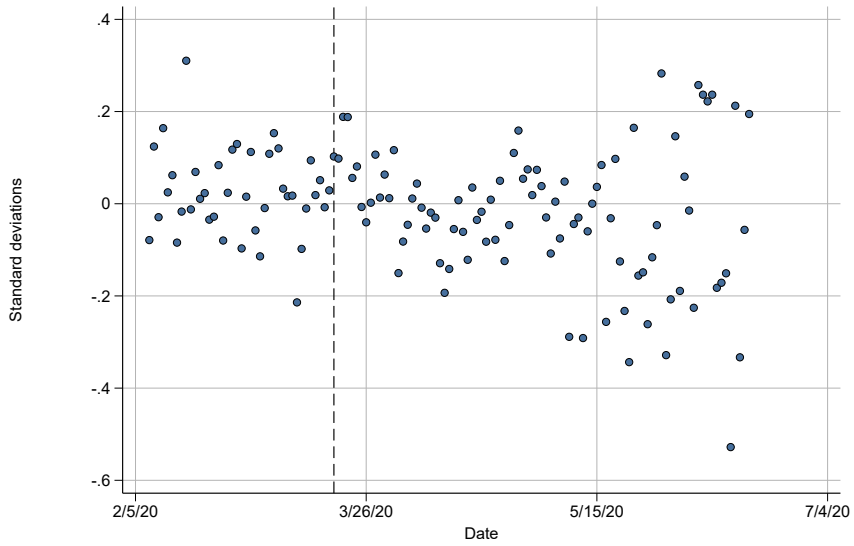
As Figure 2 shows, there is no pronounced discontinuity – Merkel's address to the nation does not impact individual climate and environmental concerns. Figure 2 also shows that the concerns are stable during the 2020 interview period (from February to June).[8]

Similar result is found when we estimate Equation 1 (Table 2, column (1)). If anything, we find a small (6-7%) increase in concerns (column (1)), however, as Figure 2 shows this increase fades over time. While the direction of the effect is into the opposite direction of the effect found in Evensen et al. (2021) who find a small decrease in climate change beliefs in the UK, the effect sizes are very similar.

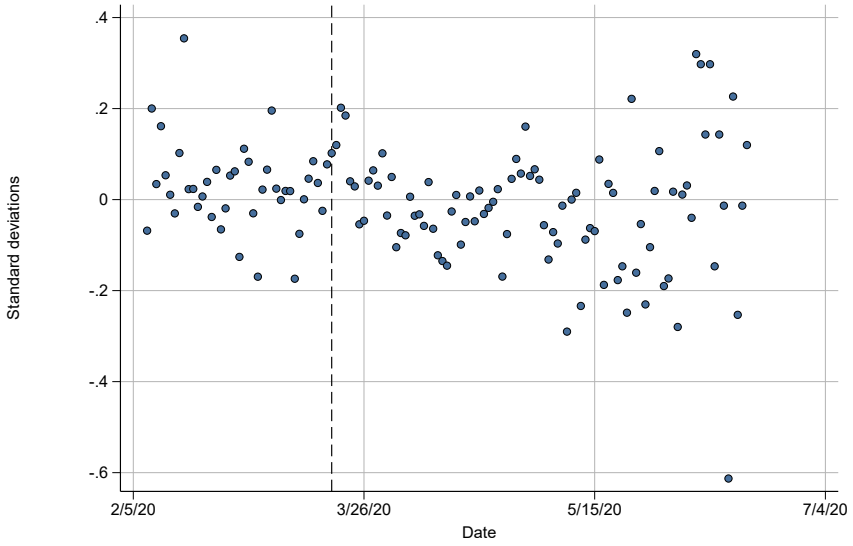
We also find suggestive evidence that the effect of Merkel's address on environmental concerns operates at the extensive and not the intensive margin. Columns (2) and (3) in Table 2 show results for different specifications of the concerns variable. Column (2) corresponds

[8]Greater dispersion of concerns in May and June partially reflects a smaller sample as the number of interviews declines with time.

Figure 2: Discontinuity around Merkel's address to the nation



(a) Concerns about the impacts of climate change



(b) Concerns about environmental protection

Note: The dependent variable is normalized to have mean zero and standard deviation one of the control group. Each dot corresponds to the mean of the outcome at the respective day of measurement. Data source: SOEPv.37eu.

to results for an indicator that is equal to one if individuals indicate that they are either somewhat or very concerned and zero if not concerned at all. Column (3) shows results for an indicator that is equal to one if individuals indicate they are very concerned and zero if they are somewhat or not concerned. Column (2) shows that Merkel's address does not affect individuals' concerns about the impacts of climate change or environmental protection at the extensive margin. However, the address changes those concerns at the intensive margin, as indicated by a statistically significant at 10% coefficient in column (3). The likelihood of being very concerned in response to the address increases for both dimensions by three or four percentage points. Relative to the baseline means, this corresponds to a relative change of about 12.5% for being very concerned about the impact of climate change and 13.8% for being very concerned about environmental protection. These results are consistent with the notion, introduced earlier, that concerns about the pandemic and environment are somehow complementary.

It is reasonable to wonder whether these concerns translate into action. The appendix includes a section on concern relevance and provides evidence that, for example, lagged concerns about the climate and environment predict both the likelihoods of charitable giving and voting Green. For example, relative to the "not concerned at all" benchmark, those who were "very concerned" about the climate change (resp. environment protection) were 16.1 (resp. 19.1) percentage points more likely to donate, a difference that is large, significant and robust with respect to the choice of controls. In a similar vein, those who were "very concerned" about climate change (resp. environment protection) were also 11.8 (resp. 12.2) percentage points more likely to vote Green, effects that are once again large, significant and robust. A plausible implication of these results is that on the intensive margin, at least, increased concerns had real consequences.

5.3 Robustness

Quadratic trends: Our results are robust to the inclusion of a quadratic trend in the running variable, instead of a linear trend.[9] Table A.3 displays the results if we control for a

[9]Commonly, regression discontinuity designs are prone to bias due to misspecification. A common procedure is to test how robust the estimates are to higher order polynomials in the running variable. However,

Table 2: Effect on climate and environmental preferences

	(1)	(2)	(3)
	Raw scale	Concerned at all	Very concerned
Panel A: Concerned about impact of climate change			
Interview after 18 March	0.070**	0.015	0.031*
	(0.032)	(0.017)	(0.016)
Mean of the control group		0.880	0.407
N	7688	7688	7688
Panel B: Concerned about environmental protection			
Interview after 18 March	0.061*	0.000	0.038
	(0.036)	(0.016)	(0.026)
Mean of the control group		0.895	0.363
N	7691	7691	7691

Notes: Dependent variables are concerns about the impacts of climate change in panel (A) and about environmental protection in panel (B); they are shown as the raw scale, measured in standard deviations of the control group in column (1), as an indicator that is equal to one if an individual has any concerns, and zero otherwise in column (2), and as an indicator that is equal to one if an individual is very concerned, and zero if the individual is somewhat concerned or not concerned at all in column (3). The estimates are from a regression of the outcome on an indicator that is equal to one if an individual was interviewed after Angela Merkel's address and a linear trend in the number of days relative to Merkel's address, which is allowed to differ before and after the date of the speech. In all regressions, we control for a full set of interview mode indicators, use a 20 days bandwidth, and apply triangular kernel weights. The standard errors, in parentheses, are clustered on the level of the running variable. A */**/*** next to coefficient indicates significance at the 10/5/1% level.

quadratic trend for concerns about the economy (panel (A)) and one own's economic situation (panel (B)).[10] The estimate for concerns about the economy is half its point estimate in Table 1; however, the estimate for concerns about own's economic situation remains unchanged, pointing to the robustness of our estimates to the inclusion of quadratic trends. Table A.4 shows the results for climate and environmental concerns: the effects on the raw scale of climate concerns (column (1) in panel (B)) and the indicator for being "Very concerned" (column (3)) increase in magnitude and remain statistically significant. Similarly, the effects on the concerns about environmental protection (panel (B)) on the raw scale (column (1)) and the indicator for being "Very concerned" (column (3)) increase in magnitude, however, they are not statistically significant.

Bandwidth choice: Our results are also robust to various bandwidth choices. Figure A.4 in the appendix displays the effect sizes and associated 95% confidence intervals for our two main outcomes – concerns about the climate change impacts and environmental protection in panels (a) and (b), respectively. Throughout, the coefficient estimates are relatively stable or become stable as the bandwidth approaches the MSE-optimal bandwidth.

Placebo regression: We repeat the estimation of Equation 1 using data from 2018, as a placebo check. Table A.5 in the appendix shows the results where the discontinuity is set for 19 March 2018. We use data from 2018, two years prior to the COVID-19 pandemic in 2020, when temperatures were comparable[11] and report results controlling for interview mode effects, as in our main specification in panel (A), and without controlling for mode effects in panel (B). As expected, there are no discontinuities.

Event study analysis: Finally, we confirm our results with an event study analysis, where we compare the weekly concerns reported in 2020 (the COVID-19 year) to the weekly concerns reported in 2018. Figure A.5 in the appendix shows the point estimates of the coefficients of the interactions of the indicator equal to one if the survey year is 2020 and

Gelman and Imbens (2019) show that these polynomials should be limited to polynomials of second order.

[10]Note that the MSE-optimal bandwidth varies for quadratic specifications. To utilize the data in the best way possible and avoid discussions about robustness with respect to bandwidth choice, we do not restrict the bandwidth in this exercise *a priori*, but present only results with the MSE-optimal bandwidths.

[11]In contrast to both 2018 and 2020, 2019 was characterized by unusual flooding and heat waves in Germany, as described on https://www.dw.com/en/storm-axel-causes-travel-disruption-flooding-in-germany-austria/a-48820037, and https://www.worldweatherattribution.org/human-contribution-to-the-record-breaking-july-2019-heat-wave-in-western-europe/.

a full set of indicators for the weeks in the respective years. Additional controls include the week and an indicator for 2020 as well as individual fixed effects. The sample consists of observations from 2018 and 2020. Concerns about the climate impacts (panel (a)) and environmental protection (panel (b)) are the same across 2020 and 2018 and do not change before and after Merkel's address, confirming the results in Figure 2. We do, however, see an increase in concerns about the economy and own economic situation echoing the results from Table 1.

5.4 Heterogeneity analysis

We further focus on the effect of Merkel's address on concerns about the climate change impacts for various subsamples – where we split the main sample by age (older than 40 or younger), educational attainment (those with at least general intermediate qualifications and those without), risk preferences, time preferences, social trust, and depression status (those who report at least a modest depression based on PHQ-4 score and those who do not report any). Table 3 displays the effect sizes for various sample splits, where panel (A) displays the effect size for high realizations of the splitting variable, i.e., concerns about the climate change impacts, and panel (B) displays low realizations of the splitting variable. For most sample splits, the impact is positive, but small in magnitude and not statistically significant, echoing the results in Table 2.

We find that the effect is mainly concentrated among individuals who are older than 40 years: for them, Merkel's address increases concern about climate by 9% of a standard deviation (column (1)); in contrast, the effect is virtually zero for younger adults. One possible explanation is that Merkel's address that was televised on the evening of 18 March 2020 is more salient to older individuals who are consuming more traditional media than younger individuals. Risk and time preferences also seem to matter. The effect of Merkel's address is concentrated among individuals who score 5 or lower on the scale for willingness to take risks – for them the concerns about the impacts of climate change increase by 12% (panel (B) in column (3)), suggesting that more risk-averse individuals become more concerned, as expected. Concerns of individuals who score higher than 5 on the patience scale increase by 12% (panel (A) of column (4)), while concerns of individuals who score 5 or lower increase

more – by 15% (panel (B) of column (4)). Finally, concerns of individuals who score above the median on the social trust scale increase by 11% (panel (A) of column (5)), while concerns of individuals with lower scores remain the same.

Last, at the request of a reviewer, we compare treatment effects for Green Party and Alternative for Germany (AfD) affiliates. It is not clear *a priori* how these will differ. One might expect Greens, given their party's *raison d'etre*, to remain focused on environmental issues, even at the expense of other concerns, but given their limited baseline concern, the response margin of AfD affiliates may be smaller, at least in the downward direction. Inference is fraught because of the small size of both subsamples, but for those affiliated with the Greens, climate worries increase 0.037 ($p = 0.512$) standard deviations while environmental worries decrease 0.028 ($p = 0.615$), while for AfD affiliates, the corresponding numbers are 0.104 ($p = 0.597$) and -0.020 ($p = 0.933$). None of these effects are large or statistically significant, but suggest, at face value, that AfD affiliates were *more* responsive.

5.5 Two other tests

In this subsection, we share two pieces of corroborating evidence that Merkel's address did not decrease the strength of concerns about the impact of climate change or environmental protection relative to all others, with details relegated to the online appendix. The first is found in Table A.6, which reports the results of applying our empirical design to the average of the two "green" concerns, *i.e.*, concerns about the impact of climate change and environmental protection, relative to the "grey" or all other concerns (we follow Grandin et al. (2022) to construct this pro-environmental score). As the coefficient in column (1) is close to zero and statistically insignificant, we reject the hypothesis that "green" concerns increased relative to "grey" concerns. If we focus only at one "green" concern at a time (columns (2) and (3)), the coefficient estimates also remain close to zero and statistically insignificant.[12]

It is possible, of course, that the respondents to the SOEP survey had additional concerns not captured by pre-formulated items. The survey included, however, an option for *other*,

[12]The difference between "green" and "grey" concerns would have remained the same, of course, if both had *decreased* the same amount, but given our additional results on online searches, this is unlikely.

Table 3: Heterogeneity analysis, concerns about the consequences of climate change

	(1)	(2)	(3)	(4)	(5)	(6)
	Age	Depression	Educ.	Risk	Patience	Social trust
Panel A: High realizations						
Interview after 18 March	0.089***	0.052	0.060	–0.005	0.116***	0.112*
	(0.032)	(0.110)	(0.044)	(0.070)	(0.036)	(0.060)
N	5459	1901	5536	3119	3857	3253
Panel B: Low realizations						
Interview after 18 March	0.033	0.071	0.085	0.120***	0.150*	0.057
	(0.077)	(0.049)	(0.085)	(0.035)	(0.083)	(0.066)
N	2229	5279	1969	4110	2693	3253

Notes: Dependent variable is concerns about the impacts of climate change. Panels (A) and (B) display the results for high and low realizations of the splitting variable, respectively. They are age in column (1): individuals who are older than 40 and individuals who are of age 40 or younger, depression in column (2): individuals who are classified of having at least a modest depression and individuals who are not classified of having any depression in 2019, education in column (3): individuals who have at least a general intermediate qualification and individuals that have a lower qualification, risk preference in column (4): individuals who score higher than 5 on the scale for individual willingness to take risks and individuals who score 5 or lower, time preference in column (5): individuals who score higher than 5 on the patience scale and individuals that score 5 or lower, social trust in column (6): individuals who score above the median on the social trust scale and otherwise. The estimates are from a regression of the outcome on an indicator that is equal to one if an individual was interviewed after Angela Merkel's address and a linear trend in the number of days relative to Merkel's address, which is allowed to differ before and after the date of the speech. In all regressions, we control for a full set of interview mode indicators, use a 20 days bandwidth, and apply triangular kernel weights. The standard errors, in parentheses, are clustered on the level of the running variable. A */**/*** next to coefficient indicates significance at the 10/5/1% level.

unrestricted concerns (see Figure A.2 in the appendix). We re-code the responses to this other concern as equal to one if respondents gave any answer and zero if respondents indicated they do not have any other concerns.[13] The effect of Merkel's address on the presence of any other concerns is displayed in column (4) of Table A.6. The coefficient is positive and statistically significant at a 10% significance level. The point estimate suggests that the address increased the incidence of "Any other concerns" by about 4.7 percentage points, driven by increases in mentions of "COVID-19/Coronavirus."

The second piece of evidence comes from a reviewer's suggestion, who wondered what happened to online searches for climate-related topics before and after Merkel's address. As A.6 in the appendix suggests, Google search intensity for "climate change" ("Klimawandel" in German) does not seem to have changed. The RDD estimates reported in A.9 confirm this impression: the effect sizes are actually positive, but small and statistically insignificant for both linear and quadratic specifications. Taken together, these two results provide further evidence that moral bandwidth was not limited at this time.

6 Conclusion

As the climate crisis worsens and "the window of opportunity to secure a livable and sustainable future for all" closes (IPCC, 2023), policy makers around the world urgently need to know to what extent they can rely on general public to support climate policies and change their behaviors, especially given a range of other unprecedented catastrophes (e.g., the COVID-19 pandemic) that threaten people's livelihoods.

The German Socio-Economic Panel (SOEP) has asked a representative sample of Germans about their concerns – general and personal economic situation, health, immigration, and critically for us, impacts of climate change and environmental protection, among several others – for many decades. We use the SOEP data and Chancellor Angela Merkel's address to the nation on 18 March 2020 aimed at preparing the German population for the challenges associated with the COVID-19 pandemic that laid ahead as the threshold for a regression discontinuity in time to evaluate the impacts of another catastrophe on climate and environ-

[13] To warrant anonymity and ease the analysis of the responses, the survey implementing institute typically aggregates responses to categories.

mental concerns. We find that while Merkel's address resulted in higher economic concerns, the Germans' concerns with respect to climate and environment were not crowded out. If anything they temporarily slightly increased; and this increase was driven primarily by older, more risk averse individuals, and those with higher social trust. Our (null) result is robust to a battery of robustness checks and in line with evidence from other countries (e.g., United Kingdom (Evensen et al., 2021) and the United States (Berazneva et al., 2023)). Also, the fact that Merkel's address increased concerns about the economy in general and individual's own economic situation is consistent with results in Haan et al. (2022), who find that press conferences about the non-pharmaceutical measures in the months after March 2020 prolonged individuals' expectations about the duration of these measures. In both cases, this is robust evidence that politicians can successfully manage individuals' expectations.

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A Online Appendix

Table A.1: Summary statistics

	Mean	SD	Min	Max	N
High worries about:					
Climate	0.407	0.491	0.000	1.000	23678
Environment	0.363	0.481	0.000	1.000	23689
General economic situation	0.254	0.435	0.000	1.000	23666
Own economic situation	0.117	0.322	0.000	1.000	23686
Health	0.149	0.356	0.000	1.000	23680
Peace	0.389	0.488	0.000	1.000	23680
Immigration	0.248	0.432	0.000	1.000	23653
Social cohesion	0.276	0.447	0.000	1.000	23649
Other outcomes:					
Smokes currently	0.233	0.423	0.000	1.000	23619
Drinks alcohol currently	0.804	0.397	0.000	1.000	23609
Predetermined characteristics:					
Gender: Female	0.530	0.499	0.000	1.000	23762
Year of birth	1969.778	17.550	1921.000	2002.000	23768
Mig. background	0.214	0.410	0.000	1.000	23769
High educ. (2019)	0.727	0.445	0.000	1.000	23055
Num. HH members (2019)	2.717	1.394	1.000	12.000	23769
Illness diagnosed (2019)	0.663	0.473	0.000	1.000	21572
Additional indicators:					
Mild depression (2019)	0.271	0.444	0.000	1.000	21616
High willingness to take risks (2019)	0.442	0.497	0.000	1.000	21659
High patience (2019)	0.496	0.500	0.000	1.000	19717
High social trust (2018)	0.481	0.500	0.000	1.000	19575

Notes: Table A.1 displays the unweighted mean, standard deviation, minimum, maximum and number of individuals.

Table A.2: Test of continuity assumption

	(1)	(2)	(3)	(4)
	Coef.	Stderr.	P-value	Q-value
Gender: Female	0.029	0.018	0.102	1.000
Year of birth	0.782	0.797	0.326	1.000
Migration background	0.016	0.021	0.450	1.000
High education (2019)	–0.004	0.020	0.842	1.000
Household size (2019)	–0.033	0.068	0.624	1.000
Any illnes (2019)	0.012	0.023	0.598	1.000
High social trust (2018)	0.010	0.016	0.523	1.000

Notes: Column (5) shows sharpened two-stage q-values. The estimates are from a regression of the outcome on an indicator that is equal to one if an individual was interviewed after Angela Merkel's address and a linear trend in the number of days relative to Merkel's address, which is allowed to differ before and after the date of the speech. In all regressions, we control for a full set of interview mode indicators, use a 20 days bandwidth, and apply triangular kernel weights. The numbers in the parentheses in the table display the year in which the outcome has been measured. The standard errors are clustered on the level of the running variable. A */**/*** next to coefficient indicates significance at the 10/5/1% level.

Table A.3: Effect on concerns about the economic situation in general or about one own's economic situation, controlling for a quadratic polynmial

	(1)	(2)	(3)
	Raw scale	Concerned at all	Very concerned
Panel A: Concerned about the general economic situation			
Interview after 18 March	0.071	0.021	0.021
	(0.056)	(0.015)	(0.027)
MSE-optimal bandwidth	23.137	22.658	21.933
Mean of the control group		0.814	0.254
N	9222	8855	8411
Panel B: Concerned about one own's economic situation			
Interview after 18 March	0.161***	0.070**	0.032***
	(0.045)	(0.030)	(0.012)
MSE-optimal bandwidth	26.308	27.527	28.94
Mean of the control group		0.561	0.117
N	10258	10700	11191

Notes: The dependent variables are concerns about the economy in general in panel (A) and about own economic situation in panel (B); they are shown as the raw scale, measured in standard deviations of the control group in column (1), as an indicator that is equal to one if an individual has any concerns, and zero otherwise in column (2), and as an indicator that is equal to one if an individual is very concerned, and zero if the individual is somewhat concerned or not concerned at all in column (3). The estimates are from a regression of the outcome on an indicator that is equal to one if an individual was interviewed after Angela Merkel's address and a *quadratic* trend in the number of days relative to Merkel's address, which is allowed to differ before and after the date of the speech. In all regressions, we control for a full set of interview mode indicators, use a 20 days bandwidth, and apply triangular kernel weights. The standard errors, in parentheses, are clustered on the level of the running variable. A */**/*** next to coefficient indicates significance at the 10/5/1% level.

Table A.4: Effect on climate and environmental preferences, controlling for a quadratic polynmial

	(1)	(2)	(3)
	Raw scale	Concerned at all	Very concerned
Panel A: Concerned about impact of climate change			
Interview after 18 March	0.072**	0.010	0.039*
	(0.036)	(0.020)	(0.022)
MSE-optimal bandwidth	22.576	25.309	23.946
Mean of the control group		0.880	0.407
N	8852	9892	9218
Panel B: Concerned about environmental protection			
Interview after 18 March	0.070	0.000	0.044
	(0.043)	(0.019)	(0.037)
MSE-optimal bandwidth	25.247	27.98	25.237
Mean of the control group		0.895	0.363
N	9896	10701	9896

Notes: Dependent variables are concerns about the impacts of climate change in panel (A) and about environmental protection in panel (B); they are shown as the raw scale, measured in standard deviations of the control group in column (1), as an indicator that is equal to one if an individual has any concerns, and zero otherwise in column (2), and as an indicator that is equal to one if an individual is very concerned, and zero if the individual is somewhat concerned or not concerned at all in column (3). The estimates are from a regression of the outcome on an indicator that is equal to one if an individual was interviewed after Angela Merkel's address and a *quadratic* trend in the number of days relative to Merkel's address, which is allowed to differ before and after the date of the speech. In all regressions, we control for a full set of interview mode indicators, use a 20 days bandwidth, and apply triangular kernel weights. The standard errors, in parentheses, are clustered on the level of the running variable. A */**/*** next to coefficient indicates significance at the 10/5/1% level.

Table A.5: Placebo regressions in 2018

	(1)	(2)	(3)	(4)
	Climate	Environment	General econ sit.	Own economic sit.
Panel A: Controlling for interview mode effects				
Interviewed after 18 March 2018	0.003	–0.031	0.110	0.025
	(0.053)	(0.034)	(0.071)	(0.062)
Panel B: Not controlling for interview mode effects				
Interviewed after 18 March 2018	–0.001	–0.033	0.113	0.030
	(0.053)	(0.035)	(0.073)	(0.068)
N	6847	6849	6848	6851

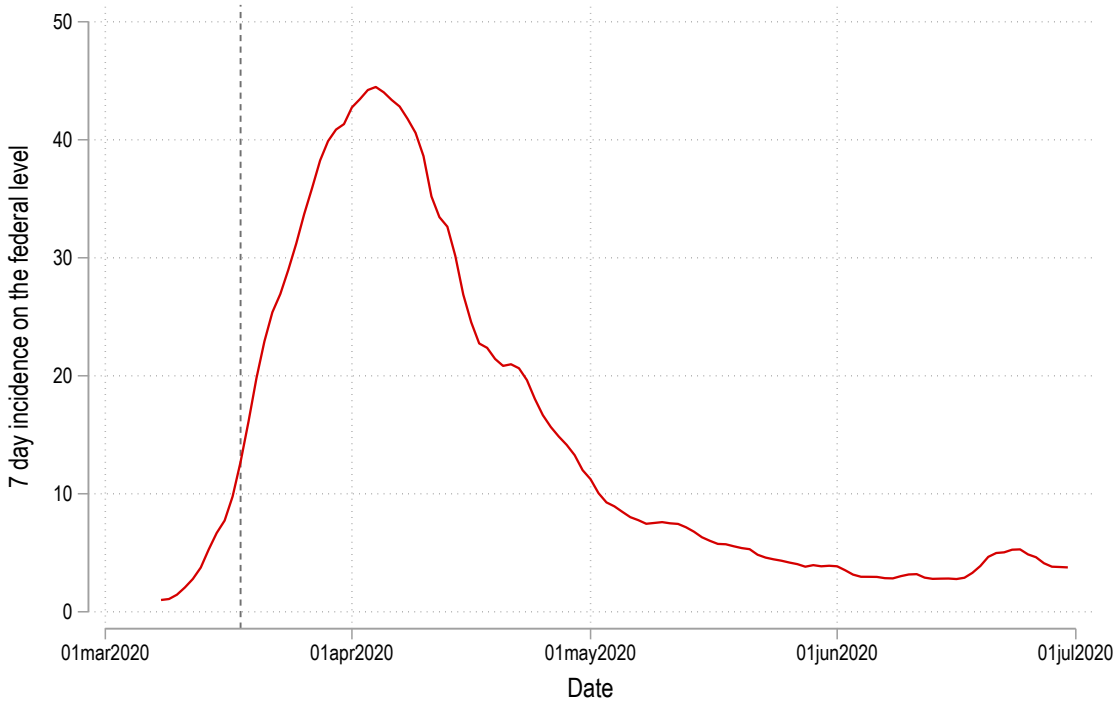
Notes: Placebo regression using the concerns reported in 2018. The dependent variables are concerns, measured in standard deviations of the control group, about the impacts of climate change in column (1), environmental protection in column (2), the economy in general in column (3), and own economic situation in column (4). The estimates are from a regression of the outcome on an indicator that is equal to one if an individual was interviewed after 18 March 2018 and a linear trend in the number of days relative to this date, which is allowed to differ before and after the date of the speech. In all regressions, we use a 20 days bandwidth, and apply triangular kernel weights. In panel (A) we control for interview mode effects, while in panel (B) we do not. The standard errors, in parentheses, are clustered on the level of the running variable. A */**/*** next to coefficient indicates significance at the 10/5/1% level.

Table A.6: Testing moral bandwidth

	(1)	(2)	(3)	(4)
	Both	Climate	Environment	Any other concerns
Interview after 18 March	0.001	0.004	–0.001	0.047*
	(0.015)	(0.017)	(0.014)	(0.026)
N	7330	7333	7333	7705

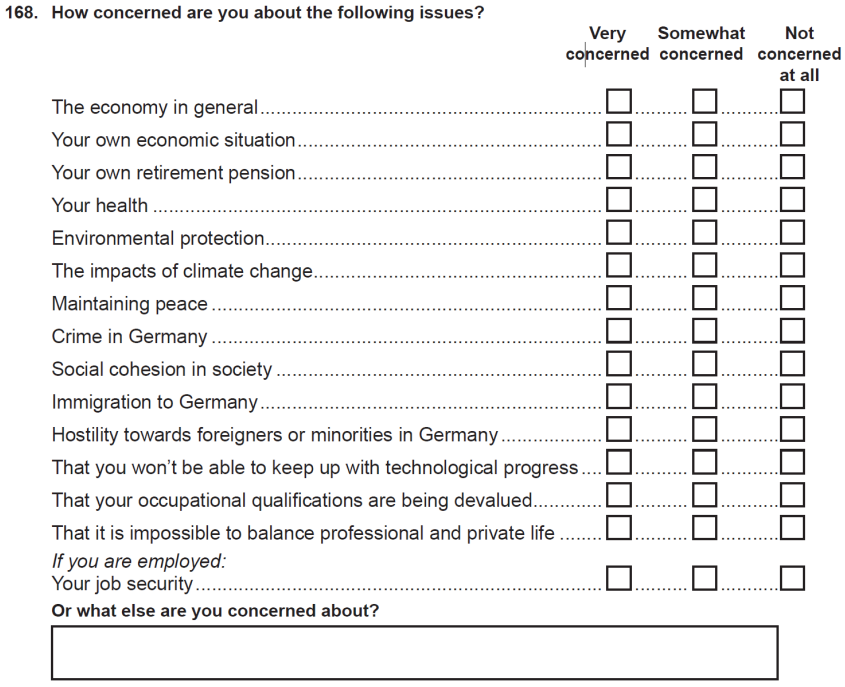
Notes: The dependent variables are climate and environmental concerns relative to the average concerns and the presence of any other concerns in column (1), concerns about the impacts of climate change relative to all other concerns in column (2), concerns about environmental protection relative to all other concerns in column (3), and any other concerns in column (4). The estimates are from a regression of the outcome on an indicator that is equal to one if an individual was interviewed after Angela Merkel's address and a linear trend in the number of days relative to Merkel's address. In all regressions, we control for a full set of interview mode indicators, use a 20 days bandwidth, and apply triangular kernel weights. The standard errors, in parentheses, are clustered on the level of the running variable. A */**/*** next to coefficient indicates significance at the 10/5/1% level.

Figure A.1: Time series of seven-day incidence per 100,000 inhabitants of COVID-19 cases on the federal level in Germany



Note: The vertical dashed line indicates the date of Angela Merkel's address on 18 March 2020.

Figure A.2: The concerns question in SOEP 2020



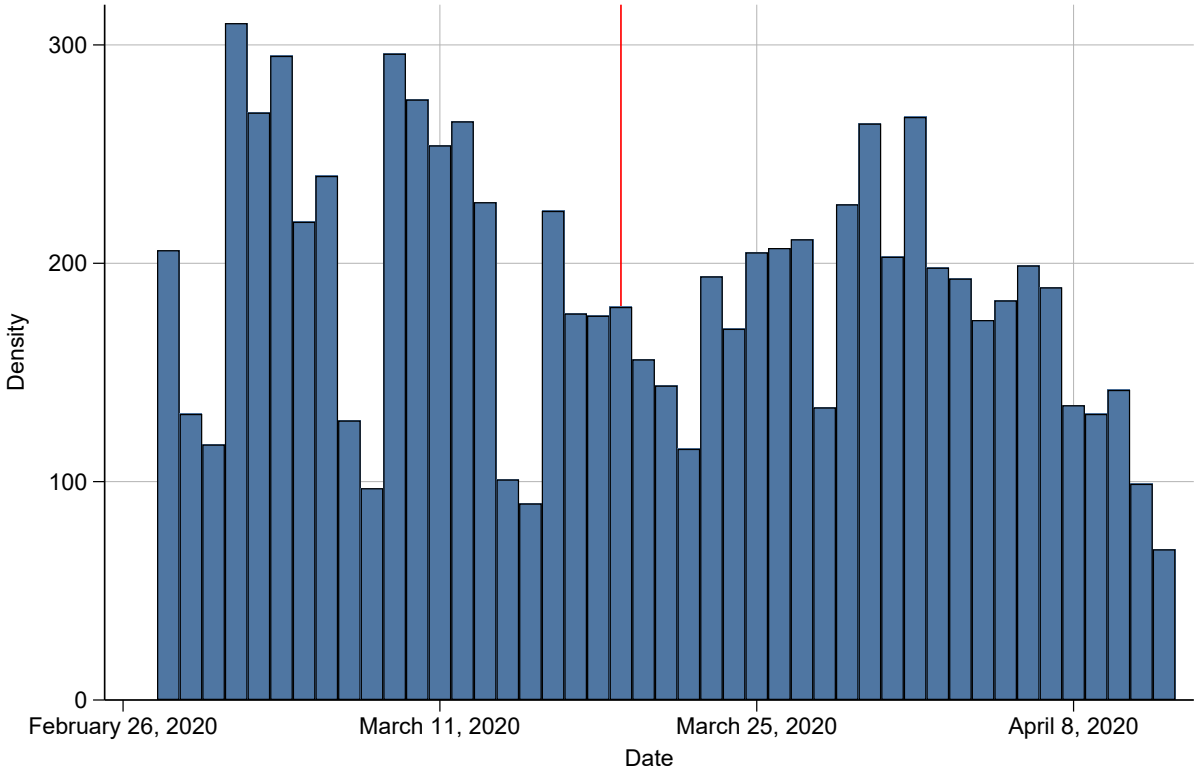
168. How concerned are you about the following issues?

	Very concerned	Somewhat concerned	Not concerned at all
The economy in general	☐	☐	☐
Your own economic situation	☐	☐	☐
Your own retirement pension	☐	☐	☐
Your health	☐	☐	☐
Environmental protection	☐	☐	☐
The impacts of climate change	☐	☐	☐
Maintaining peace	☐	☐	☐
Crime in Germany	☐	☐	☐
Social cohesion in society	☐	☐	☐
Immigration to Germany	☐	☐	☐
Hostility towards foreigners or minorities in Germany	☐	☐	☐
That you won't be able to keep up with technological progress	☐	☐	☐
That your occupational qualifications are being devalued	☐	☐	☐
That it is impossible to balance professional and private life	☐	☐	☐
If you are employed: Your job security	☐	☐	☐

Or what else are you concerned about?

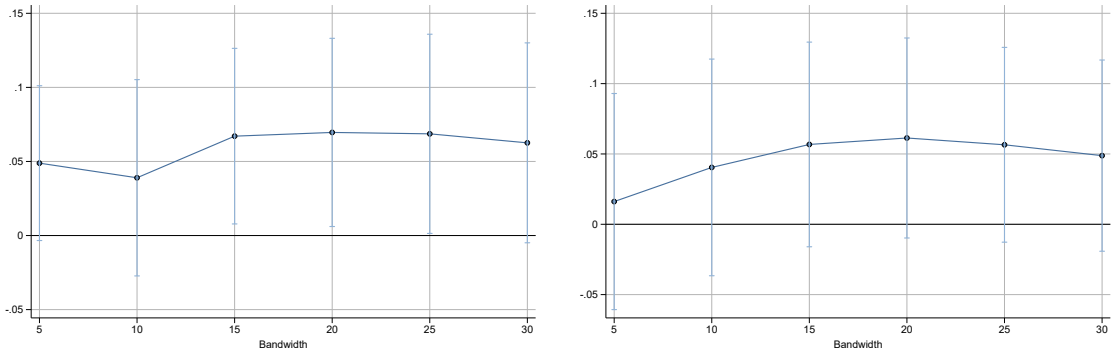
Note: Data source: SOEPv.37eu.

Figure A.3: Empirical distribution of interview dates in 2020



Note: The vertical dashed line indicates the date of Angela Merkel's address on 18 March 2020.

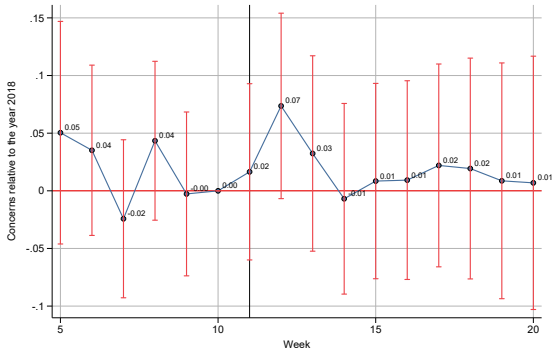
Figure A.4: Robustness of main result to bandwidth choice



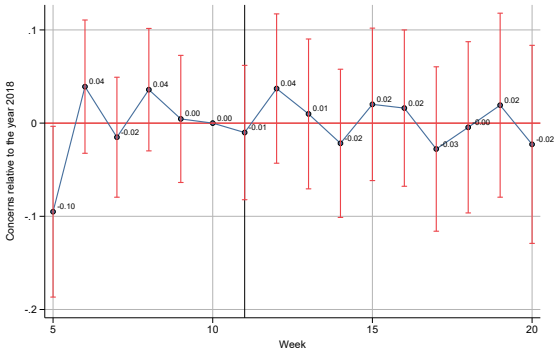
(a) Climate change (b) Environmental protection

Note: The dependent variable is concerns about the impacts of climate change in panel (a) and about environmental protection in panel (b). The coefficient estimates and 95% confidence intervals (vertical blue lines) are shown for various bandwidth choices when estimation equation (1). The estimates are from a regression of the outcome on an indicator that is equal to one if an individual was interviewed after Angela Merkel's address and a linear trend in the number of days relative to Merkel's address. In all regressions, we control for a full set of interview mode indicators and apply triangular kernel weights.

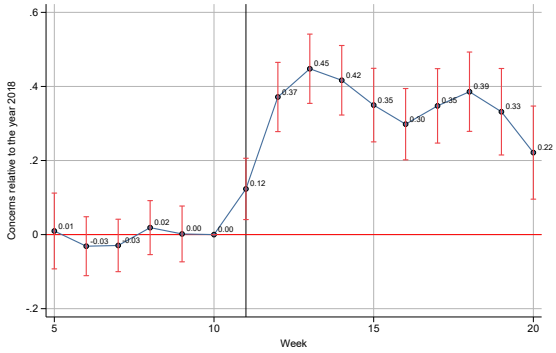
Figure A.5: Event style analysis



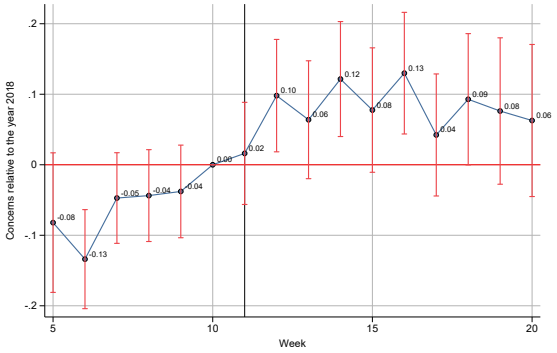
(a) Impacts of climate change



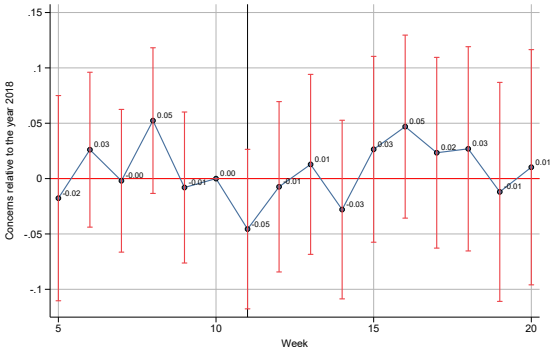
(b) Environmental protection



(c) The economy in general



(d) Own economic situation



(e) Own health

Note: The vertical dashed line indicates the week of Angela Merkel's address in March 2020. Each dot corresponds to the coefficient on the interaction of the week and an indicator that is equal to one in 2020, in a regression of the concerns on a survey year indicator that is equal to one if the survey year is equal to 2020, week indicators, interactions between those indicators and individual fixed effects, in a sample that includes observations from 2018 and 2020. The 95% confidence intervals are based on standard errors, clustered on the individual level.

A.1 Relevance of concerns

Our empirical analyses suggest that climate and environmental concerns are highly relevant for actual behavior. In Table A.7, we regress an indicator that is equal to one if individuals donated any money for a charitable cause on a set of indicators for the different levels of concerns. To limit concerns about reverse causation, all concerns are from one year before respondents were asked about whether they have donated any money to charitable causes. All control variables in this analysis are either time-invariant or also measured one year before the measurement of the outcome, i.e., they are predetermined. The results in column (1) and (3) suggest that environmental and climate concerns are strongly associated with charitable behavior. For instance, being somewhat concerned about the climate change, compared to not concerned at all, the reference category, increases the probability of donating for charitable causes by about 9.5 percentage points. The same figure is 16.1 percentage points for being very concerned, compared to being not concerned at all. Analogously, these figures are 12.8 and 19.1 for environmental concerns, respectively.

Our results also hold if we control for a wide set of characteristics. For example, the association could also be driven by different levels of education or income, which are potentially associated with both, green concerns and charitable behavior. For that reason, we include a full set of controls for age, education, income, gender and migration background. And while the coefficients are slightly attenuated, our results remain qualitatively robust to the inclusion of these controls. To be specific, compared to individuals that are not concerned at all about the climate change, the probability of donating money to charitable causes increases by about 7.2 percentage points if individuals are somewhat concerned about the climate change and 13 percentage points if individuals are very concerned. These correspond to a 19.6% and 35.4% change, relative to the mean of individuals that are not concerned about climate change, respectively. For environmental concerns, these numbers are 9.1 percentage points and 15.4 percentage points. These are 27.6% and 46.7% relative to the mean of individuals that are not concerned at all. The p-value for the test of equality of coefficients further suggests that these differences are significant across different margins of changes in concerns.

Next, we show that green concerns are strongly associated with voting behavior. For this, we regress an indicator having voted for the Green Party in 2017 on a set of indicators for

different levels of green concerns respectively.[1] Again, these concerns are measured one year before the responses, just like the control variables. Individuals that are somewhat concerned about the climate change, compared to not concerned at all, are 4.5 percentage points more likely to vote for the Green Party. Individuals that are very concerned about the climate change, compared to not concerned at all, are 11.8 percentage points more likely to vote for the Green Party. For the concerns about the environment, these figures correspond to 4.6 and 12.2 percentage points, respectively. Notably, while the effects are slightly attenuated upon the conclusion of our full set of controls, the results remain qualitatively the same. Overall, our results suggest that green concerns are strongly predictive of actual behavior.

Table A.7: The association between climate or environmental concerns and the probability of donating

	(1)	(2)	(3)	(4)
Climate concerns (ref. Not concerned):				
Somewhat concerned	0.095***	0.072***		
	(0.009)	(0.008)		
Very concerned	0.161***	0.130***		
	(0.010)	(0.009)		
Env. concerns (ref. Not concerned):				
Somewhat concerned			0.128***	0.091***
			(0.009)	(0.009)
Very concerned			0.191***	0.154***
			(0.011)	(0.010)
Observations	21856	21856	21881	21881
Controls	No	Yes	No	Yes
Test	0.000	0.000	0.000	0.000
Means	0.367	0.367	0.330	0.330

Notes: Table A.7 displays the association between the probability of donating and environmental concerns in 2015. Column (1) and (2) display the results for climate concerns. Column (3) and (4) for concerns about the environment. Odd columns include no controls. Even columns include controls for age, education, migration background, gender and the household net income. The means correspond to the mean of the outcome. The test displays the p-value for the statistical test of equality of the coefficients. Robust standard errors are displayed in parantheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

[1] We also allocated individuals that did not vote for any party to zero. Individuals who were not eligible to vote are not included in the analysis.

Table A.8: The association between climate or environmental concerns and the probability of voting green

	(1)	(2)	(3)	(4)
Climate concerns (ref. Not concerned):				
Somewhat concerned	0.045***	0.036***		
	(0.005)	(0.005)		
Very concerned	0.118***	0.102***		
	(0.006)	(0.006)		
Env. concerns (ref. Not concerned):				
Somewhat concerned			0.046***	0.038***
			(0.005)	(0.005)
Very concerned			0.122***	0.110***
			(0.007)	(0.007)
Observations	17925	17925	17930	17930
Controls	No	Yes	No	Yes
Test	0.000	0.000	0.000	0.000
Means	0.034	0.034	0.039	0.039

Table A.8 displays the association between the probability of voting green and environmental concerns in 2018. Column (1) and (2) display the results for climate concerns. Column (3) and (4) for concerns about the environment. Odd columns include no controls. Even columns include controls for age, education, migration background, gender and the household net income from the year before. The means correspond to the mean of the outcome. The test displays the p-value for the statistical test of equality of the coefficients. Robust standard errors are displayed in parantheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

A.2 Internet search intensity

As alternative measure, we use the search intensity for the term "Climate change" ("Klimawandel" in German). We extract the daily information from 1 January until 30 June 2020. Note that the time series is standardized to have value 100 at the day of the largest search intensity. In our data, this day corresponds to 16 January 2020. The time series is displayed in Figure A.6a. Figure A.6b displays the time series just around the cut-off associated with Merkel's address. Both time series do not suggest that any discontinuities exist around Merkel's address.

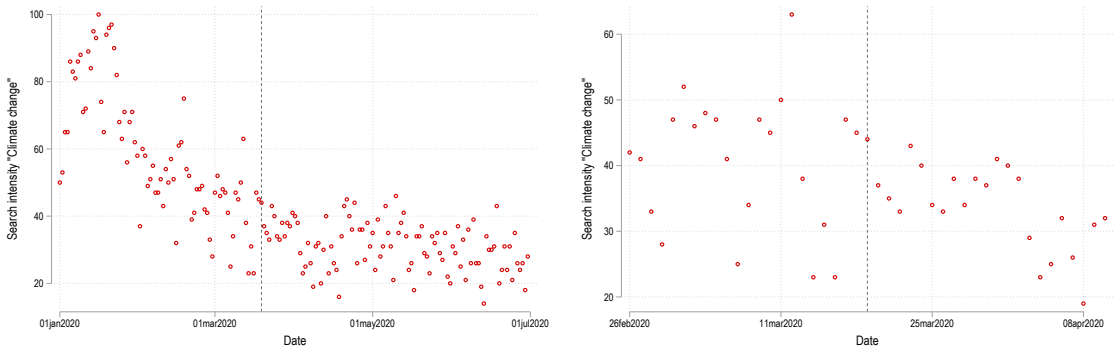
Analogous to the analysis with the SOEP data, our RDD estimation reveals no relevant effect of Merkel's address on the search intensity for "Climate change". Table A.9 displays the results for the linear and quadratic specification, where the effect sizes of Merkel's address are 2.36 and 2.12. Both estimates are not statistically significant at conventional levels of significance. Moreover, the effect sizes correspond to about 5 and 6 % of the pre-treatment control group mean displayed in Table A.9.

Table A.9: The effect of Merkel's speech on the search intensity of the term "Climate change"

	(1) Linear	(2) Quadratic
Merkel's speech	2.359	2.121
	(5.784)	(8.164)
Bandwidth	22.034	24.862
Observations	45	49
Means	41.375	41.375

Notes: Dependent variables is the Google search intensity of the term . The estimates are from a regression of the search intensity, on an indicator that is equal to one if an individual was interviewed after Angela Merkel's address and a linear (column (1)) and quadratic (column(2)) trend in the number of days relative to Merkel's address, which is allowed to differ before and after the date of the speech. In all regressions, we apply triangular kernel weights. We use the MSE-optimal bandwidth for each regression. The means correspond to the pre-treatment means in the control group. The standard errors, in parentheses, are clustered on the level of the running variable. A */**/*** next to coefficient indicates significance at the 10/5/1% level.

Figure A.6: Search intensity for "Climate change"



(a) First 6 months

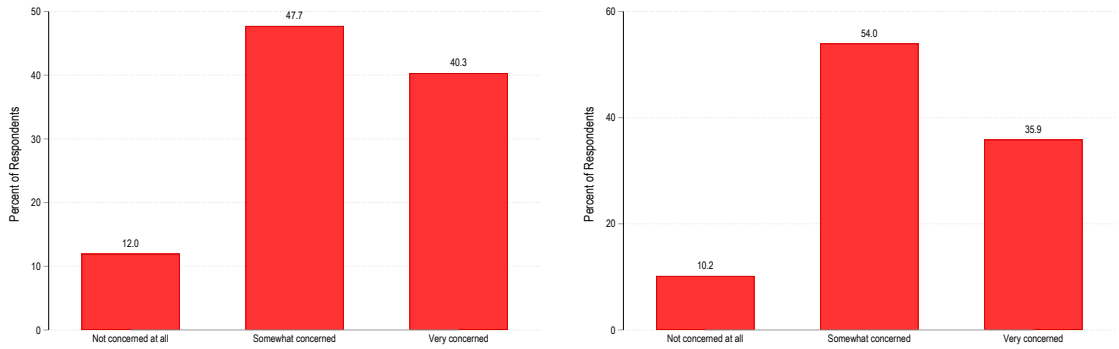
(b) 22 days around Merkel's address

Note: Figure A.6a and A.6b display the Google search intensity from 1 January to 30 June 2020 and within 22 days before and after Merkel's address. The vertical line indicates the day of Merkel's address. Each dot corresponds to the daily search intensity for the term "Climate change".

A.3 The distribution of the responses in the control group

We are confident that floor effects are not attenuating the magnitudes of the estimates. Figure A.7 displays the distributions of responses for our two main outcomes within the 20 days prior to Merkel's address, i.e., the control group. Since our hypothesis is predicting a decline in the climate or environmental concerns, we are interested in how many individuals score above the lowest response category. In our case, up to 88% and 89%, respectively, are located above the lowest category. Thus, we are confident that floor effects are not attenuating the overall effects.

Figure A.7: Distributions of concerns in the control group



(a) Climate (b) Environment

Note: Figure A.7a and A.7b display the distribution of responses among respondents within the 20 days prior to Merkel's address.