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Abstract

This paper studies how the communication of political leaders affects the expectation formation of the public. Specifically, we examine the expectation management of the German government regarding COVID-19-related regulatory measures during the early phase of the pandemic. We elicit beliefs about the duration of these restrictions via a high-frequency survey of individuals, accompanied by an additional survey of firms. To quantify the success of policy communication, we use a regression discontinuity design and study how beliefs about the duration of the regulatory measures changed in response to three nationally televised press conferences by former Chancellor Angela Merkel and the Prime Ministers of the German federal states. We find that the announcements of Angela Merkel and her colleagues significantly prolonged the expected duration of restrictions, with effects being strongest for individuals with higher ex-ante optimism.

1. Introduction

The observation that expectation management is an important component of economic policy has been acknowledged most prominently in the field of monetary policy (e.g. Rivot, 2017) but applies to many markets. It is clear that improving forecasts of demand and supply is important for reducing the uncertainty of economic agents. Correspondingly, analyses of market expectations appear increasingly often and in many guises. A common finding is that the management of expectations is especially important after exogenous shocks or structural breaks in the economy, because agents’ uncertainty about their own forecasts of market fundamentals is at its greatest and the heterogeneity of expectations across agents is correspondingly large.1

This paper studies how policy communication affects expectations of individuals. Specifically, we quantify the effects of statements about COVID-19-related regulatory measures made by former Chancellor Angela Merkel and the prime ministers of the German federal states during the early phase of the pandemic. Our analysis contributes to an emerging literature that studies whether heterogeneous population expectations can be influenced by policymakers.2

The outbreak of the COVID-19 pandemic in early 2020 was a major structural break, taking the world by surprise and creating a world-wide guessing game about the outbreak’s scale and the pandemic’s endurance. We focus on the latter uncertainty, about the pandemic’s duration and the related restrictions, which is of
first order for expectation management and hence of major eco-
omic importance. Expectations about the pandemic's duration 
were highly unrealistic in its early phases: even after the first 
larger-scale infections in metropolitan centers of different coun-
tries, few economic decision-makers anticipated a long-lasting 
impact. For instance, Bartik et al. (2020) surveyed American busi-
nesses between late March and early April 2020, finding that 
respondents predominantly predicted the crisis to have ended by 
June 2020.\footnote{Buchheim et al. (2022) obtain similar findings for German firms in April 2020 that, on average, expected the crisis to be over by August 2020.} What did become clear very quickly is that the crisis, 
while it lasts, would result in massive changes to economic activity 
and to private lives. A combination of voluntary measures and 
imposed restrictions rapidly reduced supply and demand in many 
markets and affected various other aspects of everyday life. As a con-
sequence, many choices (as well as macroeconomic expectations) of 
individuals and firms depend on the expected duration of the pan-
demic. For example, Buchheim et al. (2022) find that German firms 
that expected the shutdown to last longer were more likely to lay 
off workers or to cancel or postpone investment projects in 2020. 
Generally, the scope of economic responses to the duration of the 
pandemic was seen as large. “How much longer?” was a question 
that soon reverberated throughout the world's public media.

In this situation, many political leaders attempted not only to 
promise a solid policy response with wide-ranging public health 
measures and economic rescue packages, but also to educate the 
public about the length of the pandemic. Announcements of policy 
makers and scientists about the length of the crisis received wide 
coverage in news and social media – but so did many other public 
discussions about the pandemic. The empirical question arises to 
what extent the announcements of policy makers were effective. 
In a cacophony of media publications and expert views, are policy 
makers able to move the beliefs of the public? An affirmative 
answer would be an important prerequisite of successful crisis 
management. The large majority of the policy response is made 
up of the regulation of human behaviors – including social distanc-
ing, private consumption, and investment decisions – as such, the 
business of political leadership to reach the population’s minds is 
crucial to its effectiveness.

There are potential reasons for and against suspecting a strong 
policy communication in this context. On the positive side, one 
may argue that the regulation of social distancing, despite its nov-
elty, is relatively straightforward to describe at least in its basic 
and undifferentiated form: public events are forbidden or not, 
schools are closed or not. Consistent with this hypothesis, 
Goldberg et al. (2020) report evidence that mask wearing increased 
strongly after a corresponding recommendation by the U.S. Center 
for Disease Control. Moreover, the main regulatory decisions lie in 
the hands of a few well-identified policy makers and they are the 
same individuals who also make the public announcements. Thus, 
it may be natural to suspect that these announcements are being 
widely listened to and understood. A further factor may be that 
the pandemic’s salience and importance makes it plausible that 
even small modulations in the tone of communication can have 
significant effects.\footnote{As an illustration of a related phenomenon, Fetzer et al. (2020) demonstrate that alternative framings of the infectiousness of COVID-19 have sizable effects on the anxiety of respondents of a survey in early March, 2020.} On the negative side, the questions at hand lay in an unchartered territory and politicians are not usually viewed 
as public health professionals. Even for an experienced politician, 
the situation was new and highly uncertain. It was therefore not 
natural for the observer to believe that the policy makers knew what 
they were doing. Perceived competency is known to be one of the 
main predictors of a politician’s election success – in a novel context, 
it is not clear that the public views incumbent politicians as partic-
ularly competent.\footnote{A large literature in political science analyzes the impact of the communication by political leaders on citizens’ behavior. For example, Druckman and Holmes (2004) show that what the president says matters for what the public thinks of him, while Tedin et al. (2011) use an experimental design to show that the US President’s communication via speeches can influence political opinions. In the context of the COVID-19 pandemic, Hatcher (2020) argues that President Trump’s communication during the pandemic violated principles of public health, such as practicing transparency and deferring to medical experts, and was hence dangerous and misleading. In the same context, Newton (2020) analyzes the effect on public compliance with social distancing and lockdown rules of the British government’s information provision and the public’s use of the news media. Their findings suggest that the news media reporting had an important impact on the public’s behavior.}

To quantify the effect of expectation management on belief 
updating, we study the variation in expectations about the dura-
tion of restrictions before and after press conferences of German 
policy makers in the first months of the Corona pandemic’s out-
break. On three occasions during the spring of 2020, leading Ger-
man politicians, among them former Chancellor Angela Merkel, 
appeared in widely broadcasted press conferences and made 
announcements about the state of the pandemic as well as the Ger-
man regulatory responses. We conduct a large online survey to eli-
cit the beliefs of individuals about the duration of three well-
deﬁned restrictions: (1) when will the majority of school children 
be back in school; (2) when will the premier football league (Bund-
desliga) return to normal operations with stadium visitors; and (3) 
when will all current restrictions related to the Corona crisis be 
fully lifted? The online survey has a ﬁne time structure: the inter-
net panel that we use collects responses on a daily basis within a 
pre-deﬁned time period. Thus, in the empirical analysis, we can 
account for time trends in belief formation using a regression dis-
continuity design.

The empirical analysis in the paper consists of three parts. In the 
first part, we provide graphical evidence about the evolution of 
individuals’ expectations over time and, specifically, around the 
three press conferences. This descriptive exercise provides first 
suggestive evidence that the press conferences changed individu-
als’ expectations. In addition, the graphical analysis reveals a clear 
time trend in expectations. Interestingly, we find a similar time 
pattern for the expectations of managers of German firms for 
whom we elicit expectations in a different survey at two points 
in time. In the second part of the empirical analysis, we control 
for the overall time trend and isolate the effect of policy communi-
cation on expectations. We exploit the variation in expectations 
shortly before and after each of the three press conferences, using 
a local polynomial regression discontinuity design. In the main
specification, we use a time window of one week before and after each press conference and restrict the trend to be linear. In additional specification checks, we further show that results are robust to changes in the distance to the cut-off dates, the specification of the time trend and the definition of the outcome variable. Moreover, we conduct placebo tests and estimate the model for all available dates in the survey period. Our results show that policy communication significantly prolonged the expected duration of the restrictions. In particular, we find that the first press conference of Angela Merkel and her colleagues had a sizable impact. In this press conference, Merkel conveyed a strong sense of caution. The expected time until all restrictions would be fully lifted moved by about one month on this day, from mid-October 2020 to mid-November 2020. Likewise, the expected date of school openings moved by about two weeks. In contrast, we do not find significant effects of the second press conference on any measure of restrictions. This is not surprising, as the policy communication in the second press conference was rather vague about the duration of the restrictions. The third press conference also prolonged the expected duration of the general restrictions, but we must caveat that this point estimate is quite sensitive to specification choices and, hence, less robust than the finding for the first press conference. Next, we investigate belief uncertainty and analyze the second moments of individuals’ beliefs before and after the press conferences. We find that while the policy announcements did not significantly affect individuals’ mean beliefs about the duration of sport restrictions, there is some evidence that they reduced the dispersion in these beliefs. Studying the heterogeneity in responses to the policy communication, we find a surprising pattern of consistency – the effects do not vary much with observed respondent characteristics. We do find some differences in response behavior by gender, but no consistent differences with respect to education, age, region, regional exposure to COVID-19 or political preferences. However, in additional quantile regressions, we show that policy communication is most effective for individuals with more optimistic expectations (i.e., individuals who expect a shorter duration of restrictions) as their part of the response distribution is shifted more strongly. In the third and final part of the empirical analysis, we explore some behavioral effects of the policy announcements. Using data on planned consumption expenditure and aggregate mobility indicators, our analyses suggest that behavioral effects of the three press conferences were rather limited, which is consistent with results from previous literature. For example, Coibion et al. (2020b) do not find any effect of the expected duration of the COVID-19 pandemic on individuals’ marginal propensity to consume out of stimulus checks in the United States.

The remainder of this paper is organized as follows. In Section 2, we briefly describe the evolution of the pandemic in Germany in 2020 and explain the content of the three press conferences where policy measures were communicated to the general public. Section 3 presents the data and provides graphical evidence on the evolution of expectations over time. In Section 4, we discuss the econometric approach. Section 5 contains the results on expectations. Section 6 reports additional results on behavioral effects. Section 7 concludes.

2. Background

In this section, we describe the development of COVID-19 in Germany during the first months of the pandemic and describe the key policy measures implemented in March 2020. We focus on the effectiveness of policy communication at the beginning of the pandemic, studying three main press conferences by former Chancellor Angela Merkel between April and May 2020. In these press conferences, Angela Merkel announced to what extent existing restrictions would be continued or modified. We describe the content of these press conferences below. For a better understanding of how the effectiveness of policy communication may depend on the political context and the popularity of the political leaders, we also provide some background regarding voter support for the German government before and during the pandemic.

2.1. Timeline of COVID-19 and policy responses in Germany

Fig. 1 describes the dynamic development of COVID-19 infections, which started to strongly increase in mid-March. At this time, the German government introduced a variety of restrictions that effectively shut down large parts of both economic and private lives. These restrictions included the prohibition of large events, travel restrictions, as well as the closure of stores, schools, and recreational facilities. Citizens were told to stay at home, they could meet only one person from another household, and a minimum distance of 1.5 meters had to be kept whenever contact could not be avoided. These strict contact restrictions were renewed and extended at the end of March, without a fixed expiry date.

The period between March and May, 2020, was characterized by large uncertainty about the spread of infections, the duration of the pandemic, and the appropriate policy response. Individuals received daily information from the media, numerous policy makers, and medical experts. Similar to the evolving scientific knowledge about the COVID-19 pandemic, this information was noisy and often inconsistent.

Three main policy communication events stand out: the press conferences by former Chancellor Angela Merkel between April and May. In these press conferences, Angela Merkel announced changes to the restrictions that the federal government and state governments had agreed on. These press conferences had extremely broad media coverage, with the vast majority of Germans following the events live or accessing summaries of the press conferences. For example, on April 15, the day of the first press conference studied in this paper, more than 23 million Germans watched a summary of Angela Merkel’s speech in an evening news show, corresponding to about 30 percent of the German population. This initial media coverage was then multiplied by online and printed press and through social media outlets. Hence, it is credible to assume that most Germans were aware of the content of the press conferences (see Appendix B.1 for more details on media coverage).

We summarize the content of the press conferences below. In the empirical analysis, we then evaluate how these public announcements affected individuals’ expectations about the duration of the restrictions.

2.2. Press conferences of Angela Merkel

First press conference (April 15, 2020) In the first press conference, former Chancellor Angela Merkel announces that contact restrictions are extended until May 3, specifying that residents can meet at most one person from another household at a time and that minimum distance regulations remain unchanged. Merkel also announces that small steps are being taken to increase the freedom of movement for citizens. Shops up to 800 square meters are allowed to open if they comply with certain hygiene measures. Schools are allowed to open gradually, events with large attendance remain prohibited until August 31. The policy makers also ask the population to refrain from private travels and visits. Overall, rules remain strict.

Owing to the federal structure in Germany, the presidents of two states, Bavaria and Hamburg in the present case, accompanied Merkel.

https://www.bundeskanzlerin.de/bkin-de/aktuelles/fahrplan-corona-pandemie-1744276.
and the extent of relaxation measures falls behind expert recommendations issued prior to the press conference. In the second press conference, Angela Merkel announces only minor changes to existing rules. Contact restrictions remain in place. Church services are permitted again, while playgrounds and cultural facilities may reopen if hygienic conditions are met. Economic aid, mostly from federal sources, will be provided to alleviate the negative effects of the crisis. A further evaluation of current policies, and whether further opening measures can take place, is announced for May 6.

Third press conference (May 6, 2020) Contact restrictions are modified in that members of two households are allowed to meet. Conceding to pressure from individual state governments, Angela Merkel announces that schools and shops of all sizes are allowed to open under strict conditions. Recreational sport is permitted outside. Further, a de-centralized ‘emergency mechanism’ is imposed according to the regional development of COVID-19 infections: if the cumulative number of new infections per 100,000 inhabitants exceeds a threshold of 50 over a seven-day period in a region, new restrictions will be imposed in that region.

2.3. Macroeconomic and political context

The effect of public communication may depend significantly on the context, as well as on the popularity of the political leaders. While Germany was often referred to as “the sick man of Europe” because of low growth and high unemployment before 2005 (Dustmann et al., 2014), this changed in the mid-2000s after a series of labor market and tax reforms. These reforms came into effect when Angela Merkel became German Chancellor in 2005, although they had been initiated by the previous government. These reforms are seen as one reason why neither the Great Recession nor the euro crisis affected the German labor market severely. In contrast to the United States and most other EU countries, Germany experienced almost no increase in unemployment in 2008 and 2009, despite a sharp decline in GDP. Since 2010, the German economy had been growing for 10 consecutive years – the longest period in modern German history. Moreover, labor force participation rates of both women and men increased steadily after 2004 and the unemployment rate fell to 5 percent in 2019.

This stable economic development arguably led to relatively high popularity of former Chancellor Merkel, with approval rates of around 70 percent at the beginning of 2020. Furthermore, Archer and Ron-Levey (2020) report that before the COVID-19 pandemic, 83 percent of the German population said they had a lot or some trust in the government’s medical and health advice, and only 13 percent said they had not much trust or none. By and large, the coalition government of Angela Merkel’s center-right CDU/CSU and the center-left social democratic SPD can be described as having worked smoothly in the years preceding the pandemic. The next federal election was scheduled for the fall of 2021, hence, 2020 was not an election year and candidates of all parties were not to be elected before spring 2021. After the outbreak of the COVID-19 pandemic, Angela Merkel’s approval rates - as well as voter support of the federal government - increased to new all time highs (see Fig. A.6 in the Appendix). Angela Merkel had already announced in October 2018 that she would not seek reelection.

3. Data and graphical evidence

This section describes the data that we collected to study expectations about the duration of the pandemic and shows summary statistics for our sample. We also provide graphical evidence on the evolution of expectations over time around the three press conferences of Angela Merkel. The next section then outlines our empirical approach and quantifies the effect of policy communication on beliefs.

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8 A widely covered report by Leopoldina, the national scientific academy, dated April 13, 2020, had suggested room for a larger lifting of restrictions.
9 https://www.bundeskanzlerin.de/bkin-de/aktuelles/bund-laender-beschluesse-1749900.
10 https://www.bundeskanzlerin.de/bkin-de/aktuelles/merkel-bund-laender-gespraeche-1751090.

Fig. 1. COVID-19 cases and policy measures in Germany in 2020. Notes: Plot shows the evolution of total COVID-19 infections and regulatory measures implemented by the German government in the first months of the pandemic. Data source: RKI COVID19.
3.1. High frequent elicitation of expectations

We elicit expectations about the duration of COVID-19-related restrictions based on daily online surveys conducted by Civey. Civey is a market research and polling institute that provides Germany’s largest open access online panel with over one million active users. Civey collaborates with different online news portals and forums to place short survey modules that can be answered in a multiple-choice set-up (see Fig. A.1 in the Appendix for an example). After participating in a survey, respondents can immediately observe the overall evaluation of all other respondents, which creates an incentive to submit a response (see Fig. A.2 in the Appendix for an example). To obtain results for a balanced sample of the population, surveys are embedded in over 25,000 webpages targeting different audiences. When displaying live results, Civey applies an automated weighting procedure based on self-reported gender, year of birth, postal-code and political party preference. To limit the extent of self-selection into a particular survey, Civey invites survey participants to answer multiple surveys in a row, which are displayed in randomized order – Civey then disregards the answer to the first survey that individuals initially clicked on.

We contracted with Civey in March 2020 to survey individuals’ expectations about COVID-19-related restrictions on a daily basis, for a period of two months. Between April 2 and May 27, we obtained a total of 123,840 observations. The number of observations varies considerably between the different days and between the different questions, which is partly explained by the display of the choice set-up (see Fig. A.1 in the Appendix for an example). After displaying live results, Civey applies an automated weighting procedure based on self-reported gender, year of birth, postal-code and political party preference. To limit the extent of self-selection into a particular survey, Civey invites survey participants to answer multiple surveys in a row, which are displayed in randomized order – Civey then disregards the answer to the first survey that individuals initially clicked on.

We collected answers to the following expectation questions:

1. When will the current restrictions related to the Corona crisis be fully lifted? (Q1)
2. When will the majority of school children be back in school? (Q2)
3. When will the national football league return to normal operations with stadium visitors? (Q3)

Individuals provide answers by stating the number of months they expect it will take until the restrictions are lifted (choosing out of several categorical response options, see Appendix A.2 for details). To take out the mechanical effect of survey time on the choice of categorical response options, we also translate this information into the expected calendar date (see Appendix A.4). In our main analyses, we exclude individuals who responded that the restrictions would never end or that they did not know when they would end, but we use responses to these extreme answer categories to explore uncertainty in beliefs around the press conferences. We further restrict our analyses to individuals with complete information on socio-demographic and geographic covariates.

Owing to its open access nature, the panel is not a representative sample but a convenience sample. In Table 1 we show weighted summary statistics for our estimation sample. Civey provides survey weights separately for each question. In Columns I-III we present the summary statistics based on the weights calculated for three main outcome variables mentioned above. In Column IV we show official statistics for comparison. The weighted summary statistics for gender, age, region and political preferences are comparable to the German population. However, the distribution of educational outcomes is very different in the Civey sample. Specifically, more individuals have a university degree than in the official data and only very few individuals have no degree. Thus, a clean analysis of heterogeneous effects by education is not possible. In the main specification of our regression analyses we control for individual characteristics. In addition, we conduct sensitivity analyses and report estimates that use the sample weights provided by Civey in the Appendix.

3.2. Expectations of individuals over time

In this section, we show how respondents’ expectations about the duration of the different restrictions in Germany evolved between April and May 2020. Fig. 2 presents the evolution of categorical answers over time. The vertical lines mark the dates of the three press conferences. The figure provides first suggestive evidence that the press conferences affected the expectations of individuals. Specifically, the share of individuals expecting that restrictions will be lifted only in more than nine months increases after the first press conference on April 15th. On the same day, the share of individuals expecting restrictions to be lifted in the next 2–3 months decreases. The picture looks similar when focusing on the restrictions related to schooling. After the first press conference, the share of individuals expecting a re-opening in the next 4 weeks is reduced while the share expecting a longer restriction (2–3 months or 4–5 months) increases. The pattern at the later press conferences and for the restrictions of football events is less pronounced.

As described above, we translate individuals’ categorical responses into continuous variables which measure the expected duration until restrictions are lifted in days. This allows us to analyze how the mean and the median expected duration evolved over time and in relation to the press conferences. Despite some noise in the daily expectations data with positive and negative outliers, both the mean and the median beliefs show clear shifts around the press conferences in expectations about all restrictions and restrictions related to school closures (Figs. A.3,A.4 in the Appendix). Consistent with the pattern of the categorical answers, the median of the expected duration for all restrictions and restrictions related to schooling increases after the first press conference, corroborating the suggestive evidence that policy communication can affect expectation formation. In addition, by taking out the mechanical effect of survey time on the choice of categorical response categories, graphical evidence based on the expected calendar date reveals that individuals’ expectations show a sizable time trend over the survey period. For example, individuals surveyed at the beginning of April 2020, on average, expected all restrictions to be fully lifted by November 2020. In contrast, individuals surveyed at the end of May expected an end of all restrictions only in the beginning of 2021. A similar time pattern can be observed for specific restrictions for schools and major sports events (football); however, the expected end date of these restrictions is earlier than for overall restrictions.

The observed time trend in expectations can be explained by various factors. For example, it might be related to the arrival of new scientific information about the pandemic, new media information, or the experience of other countries with longer exposure to Corona. In Appendix E we present additional information about expectations of managers collected in the ifo Manager Survey in two waves in April and May 2020, respectively. We compare the expectations of managers and individuals over the same time periods and find a surprising similarity in the time trends (Fig. A.10). In the following econometric analysis, we control for the overall time trend to isolate the effect of policy communication at the time of.
the press conferences. In addition, we study heterogeneity by testing whether and how the effect of policy communication differs by observable characteristics and varies along the distribution of expectations.

4. Model and identification

4.1. Empirical model

To identify and quantify the effect of policy communication on expectations, we use the variation in expectations before and after the day of a press conference. We restrict the time window and focus only on changes in expectations one week before and one week after a press conference. In addition, we control for the time trend using a regression discontinuity design:14

\[ y_i = \alpha + \beta D_i + \gamma_1 f(M_i - c) + \gamma_2 D_i f(M_i - c) + x_i \delta + \epsilon_i, \]  

(1)

where \( y_i \) is a measure of the expected end date of the restriction, \( \beta \) is the coefficient of interest which captures the effect of the press conference, while \( \gamma_1 \) and \( \gamma_2 \) account for the time trend before and after the press conference. The date of the survey, measured in days, is described by \( M_i \) and \( c \) is the cut-off date. In the main specification, we use a context-based definition of the distance to the press conferences. Specifically, we use a 7-day distance wherever possible and a context-based definition of the distance to the press conferences. For the expectations about the duration of all restrictions, the graphical evidence points at discontinuities at the day of a press conference. For the expectations about the duration of all restrictions, the graphical evidence points at discontinuities at the cut-off date, the specification of the time trend and the definition of the outcome variable.

Finally, in Table A.3 in C.1 we provide evidence that manipulation around the cut-off dates does not pose a threat to identification in our setting. Importantly, the characteristics of the respondents are very similar in the days before and after the three press conferences. Differences in the observed variables (gender, education, age, children, political party preference, postal-code) before and after each press conference are either not statistically significant or, if the difference is significant, very small in magnitude.

5. Effects of policy communication on expectations

5.1. Graphical evidence

Before we turn to the results of the econometric analysis we present further graphical evidence about the changes in expectations around the three press conferences. Figs. 3a–i show binned sample means with fitted local linear trends before and after the press conferences. For the expectations about the duration of all restrictions, the graphical evidence points at discontinuities at the first and the third press conference. The same is true for expectations about school closures before and after the first press conference. The evidence is less clear for the second press conference (as expected, given that only minor changes to existing rules were delayed by 1 day).

14 Since the running variable is time, measured in calendar days, the model can be conceptualized as a time series model with a potential time break at the press conference as well. An alternative approach would be to specify an event-study model but because of our data structure with substantial variation in daily sample sizes, we opted for the time-series approach.

15 We use 6 days before and 5 days after the first press conference, 7 days before and 5 days after the second press conference and 6 days before and 7 days after the third press conference.

16 We adjust coefficients to account for level differences in expectations based on demographic characteristics, geographic variation, and differential exposure to COVID-19. Specifically, \( x_i \) contains gender (male/female), education (university/other), age (below/above age 50), children in the household (yes/no), region (northwest/southwest/east), population density (high/low), purchasing power (high/low), political party preference (Union/FDP, Red/Red/Green, AfD, Other), and the county-level quartile of the COVID-19 new infection rate.
Fig. 2. Expected duration of restrictions over time. Notes: Plots show how expectations evolved over time. Solid vertical lines indicate the three press conferences (PC). Data source: Civey Online Panel 2020.
5.2. Mean effects

In Table 2 we present our estimates of the impact of policy communication on the expected duration of restrictions. In addition to the main specification - a local linear polynomial regression discontinuity design with controls for observable characteristics - we show results from bivariate OLS without any further control variables, as well as from multivariate OLS with an interacted (global) linear time trend. As documented in the graphical analysis, the time trend has a sizable effect on expectations. Therefore, we focus on the main specification controlling for local linear time trends when discussing the effects of policy communication.

Overall, the results provide evidence that policy communication can have a significant effect on expectations. The first press conference in which Merkel conveyed a strong sense of caution significantly shifted citizens’ expectations about the duration of the pandemic. The expected time until all restrictions are fully lifted moved by almost one month (25 days) after the first press conference. In other words, the press conference shifted beliefs about the end of restrictions from mid-October 2020 to mid-November 2020. This shift amounts to one fifth of the baseline standard deviation and is equivalent to the baseline linear time trend increase over a period of 4 days. We find a similar but smaller effect on the expected duration of school restrictions, which increase by about two weeks (13 days, one quarter of the baseline standard deviation, equivalent to a 4 day baseline linear trend increase). The effect of the announcement on beliefs regarding sports events is negative, but given the sensitivity of this finding to functional form assumptions, we interpret this result with caution.

For the second press conference, we do not find significant effects on any measure of restrictions after controlling for the time trend. This is not surprising, as Angela Merkel announced only minor changes to existing rules during the second press conference and policy communication was rather vague. For the third press conference, we document that expectations about general restric-

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Fig. 3. Conditional means with local linear fit. Notes: Each observation represents the daily average expected date until restrictions are lifted. The vertical lines denote the press-conference cut-offs. The solid trend lines are based on local linear regressions.
Table 2
Estimation results: Expectation updating in response to new COVID-19 announcements.

| Event Type          | 1st Press Conference | 2nd Press Conference | 3rd Press Conference |
|---------------------|-----------------------|-----------------------|-----------------------|
|                     | (1)                   | (2)                   | (3)                   | (4)                   | (5)                   | (6)                   | (7)                   | (8)                   | (9)                   |
| All restrictions    | 30***                 | 25**                  | 25**                  | -14***                | 10                    | 8                     | 38***                 | 50***                 | 30***                 |
| MDV (pre-event)     | 14 Oct                | 14 Oct                | 14 Oct                | 28 Nov                | 28 Nov                | 28 Nov                | 16 Nov                | 16 Nov                | 16 Nov                |
| S.D. (pre-event)    | 124                   | 124                   | 124                   | 124                   | 131                   | 131                   | 132                   | 132                   | 132                   |
| N                   | 15,560                | 15,560                | 15,560                | 8,675                 | 8,675                 | 8,675                 | 12,708                | 12,708                | 12,708                |
| School closures     | 26***                 | 26***                 | 26***                 | 26***                 | 26***                 | 26***                 | 26***                 | 26***                 | 26***                 |
| MDV (pre-event)     | 05 Jun                | 05 Jun                | 05 Jun                | 05 Jun                | 29 Jul                | 29 Jul                | 01 Aug                | 01 Aug                | 01 Aug                |
| S.D. (pre-event)    | 54                    | 54                    | 54                    | 54                    | 80                    | 80                    | 80                    | 80                    | 80                    |
| N                   | 4,215                 | 4,215                 | 4,215                 | 4,215                 | 2,913                 | 2,913                 | 2,913                 | 3,450                 | 3,450                 |
| Bundesliga          | 8                     | -20                   | -20                   | -20                   | -20                   | -20                   | -20                   | -20                   | -20                   |
| MDV (pre-event)     | 13 Dec                | 13 Dec                | 13 Dec                | 19 Jan                | 19 Jan                | 19 Jan                | 27 Dec                | 27 Dec                | 27 Dec                |
| S.D. (pre-event)    | 171                   | 171                   | 171                   | 171                   | 175                   | 175                   | 175                   | 175                   | 175                   |
| N                   | 3,560                 | 3,560                 | 3,560                 | 3,560                 | 2,448                 | 2,448                 | 2,448                 | 3,017                 | 3,017                 |
| Covariates          | -                     | -                     | -                     | -                     | -                     | -                     | -                     | -                     | -                     |
| Time trend          | -                     | -                     | -                     | -                     | -                     | -                     | -                     | -                     | -                     |

Note: Civey Online Panel, April 2-May 27, 2020. Table shows the change in the expected duration in days associated with each of the three public announcements. Columns 1/4/7 show estimates from bivariate OLS on a binary indicator that takes on if the outcome was measured before the event and 1 if it was measured after the event. Columns 2/5/8 show multivariate OLS estimates with a global linear time trend centered at zero at the event interacted with the before/after indicator. Columns 3/6/9 present multivariate local linear polynomial regression discontinuity estimates. Covariates include gender (male/female), education (university/other), age (below/above 50), children in household (yes/no), region (northwest/south/east), population density (high/low), purchasing power (high/low), political party preference (Union/FDP, Red/Red/Green, AfD, Other) and county-level quartile of COVID-19 new infection rate. MDV = mean dependent variable measured before the event. S.D. = baseline standard deviation in days. Estimation with standard errors clustered at the person-level. * p < 0.05, ** p < 0.01, *** p < 0.001.

5.3. Specification checks and placebo tests

In the following we describe the specification checks mentioned above and show results from placebo tests that support the central findings of our analysis. Appendix C contains additional robustness checks, such as reweighted estimates and sensitivity to inattentive respondents.

Distance to cut-off We alternatively specify our main model for a fixed 5-day, 6-day, and 7-day pre/post distance around the respective events to analyze the sensitivity of our results to the chosen distances around the cut-off dates (Table A.4 in Appendix C.2). The results for the first and second press conference are robust to the variation in the time window. For the third press conference, we must caveat that the sensitivity analysis based on a narrow 5-day cut-off distance renders insignificant the effect on beliefs about general restrictions and, hence, this result is less stable and should be interpreted with some caution.

Functional form of the time trend Next, we compare our main specification based on a local linear time trend assumption to models with a global linear trend, a local quadratic trend and a global quadratic trend (Table A.5 in Appendix C.2). Our main finding is robust to different specifications of the time polynomial: in all specifications, we find that the first press conference significantly shifted the expectations about all restrictions by only one month. Results for the first press conference are also mostly stable for beliefs related to school closures. For the third press conference, we again document some instability in our finding for beliefs about general restrictions, corroborating our conclusion that this result should be interpreted with some caution.

Specification of the dependent variable In Table A.6 we directly estimate the effect on the categorical variables instead of using the constructed variable of expected duration. In more detail, in Panel A we estimate the effect of the press conferences on the probability of choosing the lowest category, in Panel B we focus on the probability of the highest category and in Panel C we use an ordered probit to estimate how the shares in all categories are shifted. Again, we find significant effects of the first press conference. For example, consistent with Figs. A.5a and b, we find that after the first press conference the probability of choosing the lowest category is reduced for all restrictions and school restrictions while the probability for the highest category increases.

Placebo tests To provide empirical support for our econometric strategy, we conduct a series of placebo analyses and estimate our model for all available dates in the survey period. We use a two-day distance before and after each true press conference date and each placebo date, excluding only those days for which the two-day distance generates overlap with true treatments or for which there are fewer than four data points available (in the beginning and in the end of the survey period).17 This results in 37 placebo estimates and three treatment estimates for each of the three outcomes (all restrictions, school closures and Bundesliga). We distinguish two types of placebo estimates: (i) ‘true’ placebo days at which no event took place and (ii) days at which events other than the three main press conferences took place. These other events include speeches and meetings of Angela Merkel and the prime ministers that were also related to COVID-19 but which, in contrast to the three events followed by the main press conferences studied, did not change official COVID-19 regulation. Given the narrow

17 We also ran specifications with three to seven day distances from cut-off, which reduces the number of available placebos and results in comparable estimates.
two-day time corridor around each date, we cannot estimate a local linear trend and use a linear trend in this set of placebo analyses instead.

In Fig. 4 we show the tests for the question on general restrictions. Out of the 37 placebo coefficients, 32 (36) are insignificant at a significance level of 95% (99%). Point estimates are mostly small or even negative. This is also documented in Panel b where we plot the empirical cumulative distribution function of placebo and treatment estimates. The coefficients of the first and the third press conference are above the 90% percentile of all estimates, which underlines the impact of the events in terms of magnitude of the point estimates. However, the effect of the third press conference is estimated much less precisely. Taken together with the evidence from other sensitivity analyses presented above, we are confident in our estimate regarding the first press conference, but more cautious in interpreting the effect of the third press conference.

5.4. Uncertainty in beliefs

In this section, we investigate if policy communication also affects uncertainty in beliefs. We analyze the occurrence of undecided and extreme responses to the expectations questions and, in addition, analyze the second moments of individuals’ beliefs before and after the press conferences.

Undecided and extreme responses

Based on linear probability models with our preferred multivariate specification, we analyze whether the press conferences changed undecided and extreme response behavior (Table A.11 in Appendix D). The share of respondents who said they did not know when restrictions would end moderately increased over time. Moreover, we find that the first press conference significantly increased the share of undecided respondents, indicating a moderate increase in uncertainty. There is also some evidence that the second press conference reduced the probability of choosing an extreme response to the question on general restrictions: the share of respondents who said restrictions would never end decreased by 6 percentage points. Overall, however, extreme response behavior remains relatively stable over time and does not vary systematically with policy communication.

Second moment analysis

Intuitively, one can expect individuals’ expectations to be more responsive to policy communication when prior uncertainty is high. While we do not measure uncertainty directly, we can compare the variability in individuals’ beliefs before and after the press conferences (Fig. A.8 in Appendix D). Overall, variability in expectations is relatively high. For example, the standard deviation of beliefs before the first press conference is 124 days for general restrictions and 54 days for restrictions related to school closures. Variability is highest in expectations about the duration of sports restrictions, with a baseline standard deviation of 171 days. We run two-sample variance comparison tests to analyze descriptively if standard deviations changed after the press conferences. We find a sizeable and significant decrease by 14 days in the standard deviation of beliefs about the duration of sports restrictions following the first press conference (p = 0.007), and further reductions that do not pass the threshold of statistical significance after the other two events. Hence, although the press conferences did not significantly affect mean beliefs about sport restrictions, a descriptive analysis indicates that policy communication may have reduced the dispersion of these beliefs. The variability in beliefs about general restrictions did not change notably after the first two press conferences but fell slightly by 4 days following the third press conference (p = 0.0237). In contrast, the variability in beliefs about restrictions related to schooling increased significantly after the first (13 days, p = 0.0000) and the third (9 days, p = 0.0000) press conference. This is partly explained by an overall increase in the variability of beliefs about school restrictions over time, and we note that we do not control for a time trend in this analysis. Nevertheless, these descriptive results corroborate our main findings that individuals adjusted their expectations about when children would be back in school in response to policy announcements.

5.5. Heterogeneous effects

Next, we explore effect heterogeneity and study the extent to which policy communication has different effects on subgroups and varies over the distribution of expectations.

First, we study whether individuals’ responses to the press conferences differ by individual characteristics (Table 3). We split the sample by observable variables, such as gender, education, age, presence of children in the household, political preferences, region, and regional exposure to Corona and run separate local polynomial regression discontinuity estimates using Eq. Appendix 1 with local linear time trends for the different subgroups. Overall, effect heterogeneity is rather low. The point estimates suggest different effects by gender. Specifically, the first and the third press conference shift expectations of women more than those of men. This gender difference is consistent with previous results on gender differences in COVID-19 attitudes and behavior. For example, using data from eight OECD countries including Germany, Galasso et al. (2020) show that women are more likely to perceive the pandemic as a very serious health problem and are also more likely to agree and to comply with restraining measures. Moreover, Cobillon et al. (2022) propose that women may respond more strongly to information treatments because of lower ex-ante confidence in their beliefs. While point estimates are different, the gender differences are no longer significant when accounting for multiple hypotheses testing. Therefore we report the gender effect with caution. The same holds true for the other subgroups: effects are not significantly different. One important reason for this lack of heterogeneity might be related to the high uncertainty and missing knowledge about COVID-19, which affects all groups alike.

In Table 4, we turn to the effects of policy communication on the distribution of expectations and present results from unconditional quantile regressions. Specifically, we present estimates of Eq. 1 for the median as well as the 25th and the 75th percentiles using the method proposed by Firpo et al. (2009). Policy communication does not just shift mean expectations but it also significantly affects the distribution. The pattern for the expectations regarding all restrictions suggests that more optimistic individuals, who expect a shorter duration of restrictions, respond more strongly to policy communication than more pessimistic individuals with expectations at the 75th percentile. Interestingly, we even find sizeable and significant effects for the second press conference at the 25th percentile and the median, despite the insignificant mean effect. The pattern for the duration of school restrictions and restrictions of sports events is less clear and more sensitive to specification choices (see Table A.7 in the Appendix).

18 In C.3 in Fig. A.7 we also show the placebo results for school closures and the Bundesliga.

19 We pre-registered the set of characteristics that we expected to interact with the policy announcements at https://asprected.org/el4iv.pdf. In addition to the characteristics we pre-registered, we also study heterogeneity with respect to political preference, which we were granted access to by Civey only after completing the pre-registration.

20 We use official information about COVID-19 cases by county as reported by the Robert-Koch-Institut and use quartiles to categorize counties with low, low to medium, medium to high, and high prevalence. We combine this information with the Civey data based on respondents’ zip-code.

21 The results adjusted for multiple hypothesis testing can be obtained from the authors upon request.
In the final section, we analyze whether the policy communication by Angela Merkel and the German government succeeded in changing the actions and the behavior of German citizens. Data on planned expenses provide some evidence about intended consumption behavior. In addition, we use aggregate mobility data and explore if individuals reduced their mobility in response to the press conferences. We present behavioral effects on planned consumption behavior. In Table 3, we have data on the expected duration in days associated with each of the three public announcements for various subgroups. Coefficient estimates from local polynomial regression discontinuity estimation, adjusted for gender (male/female), education (university/other), age (below/above 50), children in household (yes/no), region (northwest/south/east), population density (high/low), purchasing power (high/low), political party preference (Union/FDP, Red/Red/Green, AfD, Other) and county-level quartile of COVID-19 new infection rate. Estimation with standard errors clustered at the person-level.

Note: Civey Online Panel, April 2-May 27, 2020. Table shows the change in the expected duration in days associated with each of the three public announcements for various subgroups. Coefficient estimates from local polynomial regression discontinuity estimation, adjusted for gender (male/female), education (university/other), age (below/above 50), children in household (yes/no), region (northwest/south/east), population density (high/low), purchasing power (high/low), political party preference (Union/FDP, Red/Red/Green, AfD, Other) and county-level quartile of COVID-19 new infection rate. Estimation with standard errors clustered at the person-level. * p < 0.05, ** p < 0.01, *** p < 0.001.
April 2 and May 27, 2020, using an additional Civey survey. The question wording is as follows: Are you planning an unusually high expense within the next 3 months, e.g. for a car, a vacation or a construction measure? Individuals can choose from eight categorical response categories: No, 0–1000 euros, 1001–2500 euros, 2501–5000 euros, 5001–15000 euros, 15001–20000 euros, more than 20000 euros. Based on the midpoints of the categorical response categories, we construct a measure of planned expenses. We also construct a binary indicator that distinguishes positive and zero amounts to study extensive margin responses.

In contrast to individual expectations about the duration of the pandemic, planned consumption expenses do not show a clear time trend (Fig. 5). Moreover, the share of individuals with no planned consumption expenses remains relatively stable over time at about 70 percent. Using regression analysis and the same specification as above, we find no robust extensive margin responses in planned non-routine consumption expenses to any of the three press conferences. Yet, there is some planned non-routine consumption expenses to any of the three press conferences. The result is even stronger for those with positive planned expenses. However, these intensive-margin effects are not present after the other two press conferences.

Next, we conduct an analysis of mobility behavior before and after the three press conferences. We use aggregate data on the daily mobility of German citizens, relative to pre-year mobility, based on mobile communications data. Mobility plummeted in March 2020, but was beginning to rise again during the time period that we study (Fig. A.11). We then compare how mobility changed after each of the three press conferences, using a similar regression discontinuity design and adjusting for the overall time trend. We find no significant shift in the level of mobility after the first and the third press conference, but some evidence of a trend break in the slope of mobility changes after the latter (Fig. A.12, Table A.13). The second press conference did reduce the mobility of German citizens significantly, but the effect was only short-lived.

Our results on the behavioral effects of policy communication should be interpreted with some caution. First, planned expenses are only an approximation of realized consumption expenses. Second, the intensive-margin effects on consumption behavior obtained in the regression models are not consistent over time. Third, the evidence on mobility patterns is based on aggregate data, which may conceal heterogeneous effects.

Taken together, our results suggest only a limited role of policy communication for consumption behavior and for citizens’ mobility, which is consistent with the results of previous literature. For

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**Table 4**
Heterogeneity: Quantile regression estimates.

|                          | 1st Press Conference | 2nd Press Conference | 3rd Press Conference |
|--------------------------|----------------------|----------------------|----------------------|
|                          | Mean (1) Q25 (2) Q50 (3) Q75 (4) | Mean (5) Q25 (6) Q50 (7) Q75 (8) | Mean (9) Q25 (10) Q50 (11) Q75 (12) |
| **All restrictions**     |                      |                      |                      |                          |
| N                        | 15,560               | 15,560               | 15,560               |                           |
| School closures          |                      |                      |                      |                          |
| N                        | 4,215                | 4,215                | 4,215                |                           |
| Bundesliga               |                      |                      |                      |                          |
| N                        | 3,560                | 3,560                | 3,560                |                           |

Note: Civey Online Panel 2020, April 2-May 27, 2020. Table shows the change in the expected duration of restrictions in days associated with each of the three public announcements. Mean effects from local polynomial regression discontinuity estimation. Coefficient estimates at the 25th, 50th and 75th percentile (Q25/Q50/Q75) based on unconditional quantile regression discontinuity estimation with local linear time splines at four knots around the event. Estimates adjusted for gender (male/female), education (university/other), age (below/above 50), children in household (yes/no), region (northwest/south/east), population density (high/low), purchasing power (high/low), political party preference (Union/FDP, Red/Red/Green, AfD, Other) and county-level quartile of COVID-19 new infection rate. Standard errors in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001.

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**Fig. 5.** Planned non-routine consumption expenditure over time. Notes: Plots show how responses evolved over time. Solid vertical lines indicate the three press conferences (PC). Data source: Civey Online Panel 2020.
example, Coibion et al. (2020b) do not find any effect of the expected duration of the COVID-19 pandemic on individuals’ marginal propensity to consume out of stimulus checks in the United States. In their analysis of “unconventional” fiscal and monetary policy measures, D’Acunto et al. (2022) find mixed effects of policy announcements on households’ consumption plans: while the announcement of a VAT change in Germany affected planned spending on durables, the ECB’s forward guidance on inflation does not appear to have such effects. It would be interesting to study the effects of the COVID-19 press conferences further with data on realized consumption and with individual-level data on mobility. In particular, public announcements about the severity of the pandemic might also contain additional information about the state of the economy and might change behavior indirectly (an “information effect” as described by Nakamura and Steinsson (2018)).

### 7. Conclusion

In this paper, we provide empirical evidence that the expectation management of policy leaders can affect the expectation formation of the public. For identification, we use variation in expectations about the duration of restrictions before and after press conferences of German policy makers in the first months of the COVID-19 pandemic. We conduct a large online survey to elicit individuals’ beliefs about the duration of three well-defined restrictions: (1) when will the majority of school children be back in school; (2) when will the main football league return to normal operations with stadium visitors; and (3) when will all current restrictions related to the Corona crisis be fully lifted?

While Coibion et al. (2020a) do not find effects of policy communication in survey experiments in the US, we use real-world press conferences in Germany as natural experiments. Our results show that policy communication indeed did affect expectations in the case at hand. In particular, we find that the first press conference of Angela Merkel and her colleagues had a sizable impact and significantly prolonged the expected duration of the regulatory measures. In this press conference, Merkel conveyed a strong sense of caution. Studying the heterogeneous effects of the policy communication, we document a surprising pattern of consistency. We only find some differences in responses by gender, but no consistent and significant differences by education, age, region, regional exposure to COVID-19, or political preferences. Moreover, our results suggest that policy communication is most effective for individuals with higher ex-ante optimism in expectations (i.e. individuals who expect a shorter duration of restrictions).

### Appendix A. Civey online survey

#### A.1. Question wording

See Figs. A.1 and A.2.
Fig. A.1. Example of an embedded Civey question on online news page.

Fig. A.2. Example of a live display of Civey responses.
A.2. Survey method

1. When will the current restrictions related to the Corona crisis be fully lifted?
   - within the next 4 weeks
   - in 5 to 8 weeks
   - in 2 to 3 months
   - in 4 to 5 months
   - in 6 to 7 months
   - in 8 to 9 months
   - in more than 9 months
   - never
   - don’t know

2. When will the majority of school children be back in school?
   - within the next 4 weeks
   - in 5 to 8 weeks
   - in 2 to 3 months
   - in 4 to 5 months
   - in 6 to 7 months
   - in 8 to 9 months
   - in more than 9 months
   - never
   - don’t know

3. When will the main football league (Bundesliga) return to normal operations with stadium visitors?
   - within the next 4 weeks
   - in 5 to 8 weeks
   - in 2 to 3 months
   - in 4 to 6 months
   - in 7 to 9 months
   - in 10 to 12 months
   - in more than 12 months
   - never
   - don’t know

A.3. Sample statistics

See Tables A.1 and A.2.

A.4. Converting number months to calendar date

In analyzing and interpreting the responses to the expectation questions over a period of two months, one must take into consideration that the categorical response categories relate to the day of the survey. A given choice (e.g. “in 2 to 3 months”) reflects a different subjectively expected end of the restrictions in early April, when the survey was started, compared to the end of May, when the survey ended. Hence, to take out the mechanical effect of survey day, we calculate the implicit calendar date by which individuals expect restrictions to end as follows: Based on the categorical answer categories, we first generate a continuous expected duration in months, using the midpoint of each interval as the expected duration. For example, we set the expected duration to 2.5 months if individuals chose the category “2 to 3 months.” For the boundary cases, we define the following expected duration: 12 months if an
individual chose category “more than 9 months” for the questions on general restrictions and school restrictions, 18 months if an individual chose category “more than 12 months” for the question on the football league. We then calculate the implicit calendar date until which individuals expect the restrictions to end, based on the exact day of the survey and the continuous expected duration in months.

A.5. Mean and median expected duration of restrictions

See Figs. A.3 and A.4.

Table A.1
Observations and sample statistics.

|                         | Overall | All restrictions | School | Football |
|-------------------------|---------|------------------|--------|----------|
| Total/ survey period    | 123,840 | 82,051           | 22,693 | 19,096   |
| Mean/ day               | 2,211   | 1,465            | 405    | 341      |
| Median/ day             | 1,043   | 488              | 227    | 187      |
| Min/ day                | 334     | 114              | 84     | 64       |
| Max/ day                | 16,291  | 15,058           | 2,294  | 1,846    |

Note: Civey Online Panel, April 2-May 27, 2020.

Table A.2
Sample characteristics of Civey respondents.

|                         | (Q1)    | Civey Online Panel (Q2) | (Q3)    | Official |
|-------------------------|---------|-------------------------|---------|----------|
| Female                  | 29.5    | 23.0                    | 20.9    | 50.7     |
| Age categories          |         |                         |         |          |
| 18–39 yrs.              | 1.5     | 1.1                     | 1.0     | 16.3     |
| 30–39 yrs.              | 5.7     | 4.4                     | 4.4     | 15.5     |
| 40–49 yrs.              | 10.9    | 8.5                     | 8.4     | 14.7     |
| 50–64 yrs.              | 38.2    | 35.8                    | 35.8    | 27.5     |
| 65+ yrs.                | 43.7    | 50.2                    | 50.4    | 26.0     |
| Region                  |         |                         |         |          |
| North/West              | 33.3    | 33.4                    | 34.9    | 37.7     |
| South                   | 42.1    | 41.5                    | 41.3    | 42.8     |
| East                    | 24.5    | 25.1                    | 23.7    | 19.5     |
| Political party preference |     |                         |         |          |
| Union/FDP               | 40.9    | 37.1                    | 39.1    | 45.0     |
| Red/Red/Green (RRG)     | 33.8    | 34.6                    | 34.8    | 39.0     |
| AfD                     | 20.6    | 24.6                    | 22.9    | 9.0      |
| Other                   | 4.7     | 3.7                     | 3.2     | 7.0      |
| Education               |         |                         |         |          |
| University degree       | 52.1    | 55.7                    | 55.6    | 19.6     |
| Vocational degree       | 45.9    | 42.3                    | 42.4    | 59.2     |
| No degree               | 2.0     | 2.0                     | 2.0     | 20.8     |

Note: Cells contain shares in percent. Official statistics on gender, education, age and region from Federal Statistical Office (Destatis), based on 2019 microcensus and 2019 forward projection of 2011 census. Official statistics on political party preference based on Forsa Sonntagsfrage of May 30th, 2020. Civey samples differ by question: Q1 = All restrictions, Q2 = School closures, Q3 = Bundesliga.

Appendix B. Context of press conferences

B.1. Media coverage of press conferences

In this section, we provide descriptive evidence that a large share of the German population followed daily news forecasts during the early phases of the pandemic. On the days of the press conferences, daily news shows primarily summarized the content of the press conferences and showed sequences of Angela Merkel’s speeches. Hence, ratings of daily news shows provide some indications of the press conferences’ initial media reception, which was
Fig. A.4. Median expectations over time. Notes: Medians adjusted for population weights. Vertical lines indicate three major press conferences. Civey Online Panel 2020.

Fig. A.5. News ratings in the pandemic. Notes: Plots show average daily ratings of Germany’s main news broadcast, the 8 pm ‘Tagesschau’, throughout 2020, with the dashed horizontal line indicating 2019 average viewing figures (Panel a), as well as joint daily ratings for the four major news shows (Tagesschau, heute, heute Journal and RTL Aktuell) during the early phase of the pandemic (Panel b). Data source: AGF, GfK, Media Control and INFOnline.

Fig. A.6. Popularity of Angela Merkel and the German government over time. Notes: Plot shows the approval ratings for Angela Merkel (solid red line) and the German government (dashed blue line) relative to approval rates in January 2020. Solid vertical lines indicate the three press conferences. Data source: Forschungsgruppe Wahlen, Politbarometer 2019–2020.
then multiplied by online and printed press and through social media outlets (see Fig. A.5).

During the pandemic, news ratings reached an all-time peak in March 2020 and remained above pre-year average ratings until June 2020. Nearly 30 million Germans watched a news broadcast on March 22nd, when the German government announced the implementation of strict contact restrictions and urged the population to ‘stay at home’. Viewing figures slightly declined between mid March and April, but continued to exceed average pre-year ratings by 40 percent. On April 15, the day of the first press conference, more than 23 million Germans watched a summary of the press conference in a news show, corresponding to about 30 percent of the German population.22 Between the first and the third press conference in early May, viewing figures fell by 30 percent, indicating an emerging trend of news fatigue.23

Table A.3
Sample composition before and after the press conferences.

|                  | 1st Press Conference | 2nd Press Conference | 3rd Press Conference |
|------------------|----------------------|----------------------|----------------------|
|                  | pre                  | post                 | pre                  | post | p (Δ) | pre                  | post | p (Δ) |
| Female           | 0.31                 | 0.28                 | 0.00                 | 0.31 | 0.27 | 0.00                 | 0.27 | 0.26 | 0.18 |
| University       | 0.51                 | 0.51                 | 0.79                 | 0.51 | 0.52 | 0.09                 | 0.52 | 0.54 | 0.01 |
| Age above 50     | 0.79                 | 0.84                 | 0.00                 | 0.82 | 0.86 | 0.00                 | 0.85 | 0.85 | 0.06 |
| Children in HH   | 0.20                 | 0.16                 | 0.00                 | 0.17 | 0.14 | 0.00                 | 0.14 | 0.15 | 0.03 |
| Political pref.: Union/FDP | 0.39 | 0.39 | 0.59 | 0.36 | 0.34 | 0.03 | 0.34 | 0.38 | 0.00 |
| Political pref.: AfD | 0.34 | 0.31 | 0.00 | 0.29 | 0.30 | 0.09 | 0.30 | 0.31 | 0.02 |
| Political pref.: Other | 0.23 | 0.23 | 0.00 | 0.26 | 0.28 | 0.02 | 0.28 | 0.23 | 0.00 |
| Pop Density: High | 0.41                | 0.40                 | 0.54                 | 0.41 | 0.41 | 0.43                 | 0.41 | 0.42 | 0.32 |
| Purch. Power: High | 0.47              | 0.49                 | 0.01                 | 0.48 | 0.48 | 0.75                 | 0.48 | 0.50 | 0.02 |
| Region: North/West | 0.33               | 0.32                 | 0.33                 | 0.33 | 0.32 | 0.02                 | 0.32 | 0.34 | 0.00 |
| Region: South    | 0.41                 | 0.42                 | 0.17                 | 0.41 | 0.42 | 0.31                 | 0.41 | 0.42 | 0.21 |
| Region: East     | 0.26                 | 0.26                 | 0.62                 | 0.26 | 0.27 | 0.19                 | 0.27 | 0.24 | 0.00 |

Note: Civey Online Panel, April 2 - May 27, 2020. Cells contain sample means before (pre) and after (post) the press conferences (PC) and p-values (p) from two sample mean comparison tests on the pre/post mean difference (Δ).

Table A.4
Estimation results: Sensitivity to the chosen distance to cut-off.

|                  | 1st Press Conference | 2nd Press Conference | 3rd Press Conference |
|------------------|----------------------|----------------------|----------------------|
|                  | c 5d 6d 7d          | c 5d 6d 7d          | c 5d 6d 7d          |
| All restrictions | 25** 26*** 24*** 22*** 8 | 11 6 4 3 0 | 15 30*** 39*** |
| MDV (pre-event)  | 14 Oct 14 Oct 14 Oct 13 Oct 28 Nov          | 23 Nov 25 Nov 28 Nov 16 Nov 10 Nov 16 Nov 16 Nov |
| N                | 15,560 15,468 15,579 16,501 8,675          | 7,357 8,351 9,354 12,708 5,735 9,868 13,534 |
| School closures  | 15 12** 12** 11** 6 | –7 10 9 | 4 1 4 9 |
| MDV (pre-event)  | 05 Jun 06 Jun 06 Jun 06 Jun 29 Jul          | 01 Aug 01 Aug 29 Jul 01 Aug 30 Jul 01 Aug 02 Aug |
| N                | 4,215 4,100 4,401 4,700 2,913          | 2,652 3,013 3,327 3,450 2,775 3,289 3,589 |
| Bundesliga       | –44** –49*** –47*** –43*** –21 | –28 –27 –23 –41* –41* –36 |
| MDV (pre-event)  | 13 Dec 13 Dec 13 Dec 09 Dec 19 Jan           | 14 Jan 16 Jan 19 Jan 27 Dec 27 Dec 27 Dec 28 Dec |
| N                | 3,560 3,481 3,736 3,977 2,448          | 2,233 2,625 2,894 3,017 2,457 2,884 3,131 |

Note: Civey Online Panel, April 2-May 27, 2020. Table shows the change in the expected duration in days associated with each of the three public announcements, comparing different distances to the respective event: main specification (c = context-based, 5–7 days avoiding overlap with other events), as well as 5 days, 6 days or 7 days respectively. Coefficient estimates from local polynomial regression discontinuity estimation with local linear time trends. MDV = mean dependent variable measured before the event. Estimates adjusted for gender (male/female), education (university/other), age (below/above 50), children in household (yes/no), region (northwest/south/east), population density (high/low), purchasing power (high/low), political party preference (Union/FDP, Red/Red/Green, AfD, Other) and county-level quartile of COVID-19 new infection rate. Estimation with standard errors clustered at the person-level in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001.

B.2. Popularity of the government and Angela Merkel

See Fig. A.6.

Appendix C. Robustness

C.1. Manipulation around the cut-offs

To rely on the regression discontinuity (RD) design, respondents who answered just before the press conference must be comparable in terms of characteristics to respondents who answered just after the press conference. The table below compares sample means of key characteristics before and after the 3 press conferences (see Table A.3).

C.2. Specification checks

This section presents results from sensitivity analyses regarding the distance to the cut-off date (Table A.4), the functional form of the time trend (Table A.5) and the specification of the dependent variable (Table A.6). We also show the sensitivity of the quantile regression estimates to the specification of the time trend (Table A.7).

22 Consistent with the data collection for TV viewing figures, the population share was calculated with respect to the population aged 3 years and above.

23 In April 2020, online news websites lost market shares whereas healthy eating and gardening websites boomed (https://meedia.de/2020/05/08/agoft-top-100-nachrichtenmedien-verlieren-teile-des-corona-plus-mein-schoener-garten-waechst-um-81-prozent/, accessed August 18, 2021.).
Table A.5
Estimation results: Sensitivity to the functional form of the time trend.

|                | 1st Press Conference | 2nd Press Conference | 3rd Press Conference |
|----------------|----------------------|----------------------|----------------------|
|                | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| All restrictions | 25*** | 25*** | 36** | 38*** | 8 | 10 | 16 | 34*** | 30*** | 50*** | −16 | 25* |
| MDV (pre-event) | 14 Oct | 14 Oct | 14 Oct | 14 Oct | 28 Nov | 28 Nov | 28 Nov | 28 Nov | 16 Nov | 16 Nov | 16 Nov | 16 Nov |
| N              | 15,560 | 15,560 | 15,560 | 15,560 | 8,675 | 8,675 | 8,675 | 8,675 | 8,675 | 8,675 | 12,708 | 12,708 | 12,708 |
| School closures | 13** | 13** | 13** | 30*** | −6 | 0 | −7 | 17 | 4 | 11 | −11 | 2 |
| MDV (pre-event) | 05 Jun | 05 Jun | 05 Jun | 05 Jun | 29 Jul | 29 Jul | 29 Jul | 29 Jul | 29 Jul | 01 Aug | 01 Aug | 01 Aug |
| N              | 4,215 | 4,215 | 4,215 | 4,215 | 2,913 | 2,913 | 2,913 | 2,913 | 2,913 | 3,450 | 3,450 | 3,450 |
| Bundesliga     | −44** | −20 | −31** | −3 | −21 | −28 | −32 | −2 | −41** | −28 | −46 | −50** |
| MDV (pre-event) | 13 Dec | 13 Dec | 13 Dec | 13 Dec | 19 Jan | 19 Jan | 19 Jan | 19 Jan | 27 Dec | 27 Dec | 27 Dec | 27 Dec |
| N              | 3,560 | 3,560 | 3,560 | 3,560 | 2,448 | 2,448 | 2,448 | 2,448 | 2,448 | 3,017 | 3,017 | 3,017 |
| Time trend     | local | local | global | quadratic | quadratic | local | local | global | local | quadratic | quadratic | quadratic |

Note: Civey Online Panel, April 2-May 27, 2020. Table shows the change in the expected duration of the restrictions in days associated with each of the three public announcements, for different specifications of the time trend. All estimates adjusted for gender (male/female), education (university/other), age (below/above 50), children in household (yes/no), region (northwest/south/east), population density (high/low), purchasing power (high/low), political party preference (Union/FDP, Red/Red/Green, AfD, Other) and county-level quartile of COVID-19 new infection rate. Estimation with standard errors clustered at the person-level in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001.

Table A.6
Estimation results: Ordered probit and LPM of boundary responses.

|                | 1st Press Conference | 2nd Press Conference | 3rd Press Conference |
|----------------|----------------------|----------------------|----------------------|
|                | All (1) | School (2) | BL (3) | All (4) | School (5) | BL (6) | All (7) | School (8) | BL (9) |
| A. Lowest category | −0.03** | −0.12*** | 0.03* | −0.01 | 0.06 | 0.03 | −0.08*** | −0.01 | 0.01 |
| MDV (pre-event) | 0.09 | 0.02 | 0.04 | 0.09 | 0.21 | 0.04 | 0.13 | 0.23 | 0.09 |
| B. Highest category | 0.06*** | 0.02* | −0.08** | 0.03 | 0.01 | −0.02 | 0.06* | −0.01 | −0.09** |
| MDV (pre-event) | 0.24 | 0.01 | 0.19 | 0.37 | 0.04 | 0.22 | 0.31 | 0.04 | 0.19 |
| C. Ordered probit | 0.28*** | 0.39*** | −0.04 | 0.22*** | −0.00 | 0.12 | 0.29** | 0.15 | −0.24 |
| MDV (pre-event) | 0.04 (0.09) | 0.06 (0.11) | 0.12 (0.13) | 0.10 | 0.13 (0.14) |
| N              | 15,560 | 4,215 | 3,560 | 8,675 | 2,913 | 2,448 | 12,708 | 3,450 | 3,017 |

Note: Civey Online Panel, April 2-May 27, 2020. Panels A and B show results from linear probability models with the dependent variables indicating if individuals chose the lower bound category (Panel A, “Within the next 4 weeks”) or the upper bound category (Panel B, “More than 9 months”) for all restrictions and school closures. More than 12 months” for football Bundesliga. Panel C shows results from ordered probit regressions of the categorical response variables excluding undecided and extreme responses (“Don’t know”/“Never”). Estimation with standard errors clustered at the person level in parentheses. MDV = mean dependent variable measured before the event. * p < 0.05, ** p < 0.01, *** p < 0.001.

Table A.7
Quantile regression estimates: Sensitivity to the functional form of the time trend.

|                | 1st Press Conference | 2nd Press Conference | 3rd Press Conference |
|----------------|----------------------|----------------------|----------------------|
|                | Mean (1) | Q25 (2) | Q50 (3) | Q75 (4) | Mean (5) | Q25 (6) | Q50 (7) | Q75 (8) | Mean (9) | Q25 (10) | Q50 (11) | Q75 (12) |
| All restrictions | local | Global | N | local | Global | N | local | Global | N | local | Global | N |
| Local trend | 25*** | 18*** | 35*** | 11*** | 8 | 74*** | 90*** | 8* | 30*** | 45*** | 34 | 0 |
| Global trend | 25*** | 22** | 27*** | 7 | 10 | 62** | 74*** | −7 | 50*** | 32** | 35** | 12*** |
| N              | 15,560 | 15,560 | 15,560 | 15,560 | 8,675 | 8,675 | 8,675 | 8,675 | 12,708 | 12,708 | 12,708 | 12,708 |
| School closures | 13** | 6* | −12** | −17** | −6 | −10 | 33*** | 57*** | 4 | 3 | 3 | 18 |
| Global trend | 13** | 5* | 1 | −7** | 0 | −11 | 35** | 45*** | 11 | −6 | −7 | 3 |
| N              | 4,215 | 4,215 | 4,215 | 4,215 | 2,913 | 2,913 | 2,913 | 2,913 | 3,450 | 3,450 | 3,450 | 3,450 |
| Bundesliga     | −44*** | 15 | −31 | −18 | −21 | −11 | −10 | −64 | −41 | −21 | −52 | −36 |
| Global trend | −20 | 15* | −26** | 2 | −28 | −23 | −56* | −40 | −28 | −47* | −29 | 17 |
| N              | 3,560 | 3,560 | 3,560 | 3,560 | 2,448 | 2,448 | 2,448 | 2,448 | 3,017 | 3,017 | 3,017 | 3,017 |

Note: Civey Online Panel, April 2-May 27, 2020. Table shows the change in the expected duration of restrictions in days associated with each of the three public announcements. Mean effects and unconditional quantile regression estimates at the 25th, 50th and 75th percentile (Q25/Q50/Q75) from quantile regression discontinuity estimation with local or global time trends. Estimates adjusted for gender (male/female), education (university/other), age (below/above 50), children in household (yes/no), region (northwest/south/east), population density (high/low), purchasing power (high/low), political party preference (Union/FDP, Red/Red/Green, AfD, Other) and county-level quartile of COVID-19 new infection rate. * p < 0.05, ** p < 0.01, *** p < 0.001.
C.3. Placebo tests

Fig. A.7 corresponds to Fig. 4, showing placebo estimates for the other two outcome variables, school closures and football Bundesliga, based on multivariate regression with an interacted linear trend and a two-day distance to cut-off.

C.4. Attentiveness

One concern with online surveys is that respondents may be distracted or poorly motivated, and thus provide answers without paying sufficient attention to the question. This would lead to measurement error and likely to attenuation bias in regression results. Inattention in web surveys has been studied in a large literature in survey research (see Shamon and Berning (2020) for a recent example and further references).

The following features of the Civey online survey should encourage attention: (i) when a respondent starts an online survey with Civey, a sequence of questions is displayed in randomized order, (ii) the randomized sequence also contains questions that Civey displays for other clients, therefore topics vary, (iii) each question comes with a small number of closed response options requiring only a single click which should reduce cognitive load and survey fatigue, (iv) all questions offer a response option for undecided respondents (“don’t know”), (v) respondents may skip questions, (vi) respondents can exit the survey at any time. While we believe that these features of the survey design limit the probability of inattentive responses, we cannot implement direct checks of attentiveness which are commonly used in longer online surveys: The fact that the Civey algorithm displays all questions in randomized order, and the short length and duration of the survey, rule out many of the checks used in the survey methods literature; Shamon and Berning (2020).

In order to characterize the potential biases that might arise from inattention, we re-estimated our models using simulated responses based on a mixture model which assumes that a certain share of respondents was inattentive and chose answers randomly. For this sensitivity check, we set the rate of inattentiveness to 20 percent. We select a random subset of one fifth of the respondents and replace their chosen outcome category by a random draw from the support of the dependent variable where each category is chosen with equal probability. We then re-estimate our regression specifications, using the simulated values of the outcome variables as dependent variables.

![Figures A.7](https://example.com/figA7.png)

**Fig. A.7.** Placebo checks and comparison to other events. Notes: Plots show coefficient estimates of the pre/post indicator from multivariate regression with an interacted linear trend and a two-day distance to cut-off. Red squares denote the three press conference treatments (PC), blue triangles show other events: (1,4) Corona Cabinet, (2) Easter address Merkel, (3) Leopoldina report, (5) Government statement A. Merkel, (6,8) Meeting A. Merkel with trade associations and unions, (7) Government interrogation Bundestag, (9) Meeting with OECD, IMF and ILO. Data source: Civey Online Panel 2020.
The results from this exercise are presented in Table A.8. The size of coefficient estimates is slightly reduced, as one would expect. Moreover, the baseline standard deviation of beliefs about the duration of school restrictions increases notably with random inattentiveness. Nevertheless, the effects of the first press conference are generally comparable to those in the main specification and remain significant, supporting our main findings.

C.5. Reweighted estimates

In this section we reweight estimates of our main results to match the population on key characteristics. Specifically, we reweight estimates to make the sample comparable to the German population in terms of age, gender, voting behavior and current political party preference, county-level purchasing power and municipal population density. Weights are constructed based on the joint distribution of age and electoral behavior as well as the joint distribution of gender and electoral behavior in the last Bundestag election using the German Microcensus, county-level income distributions provided by Land Statistical Offices and population counts and area provided by the Federal Agency for Cartography and Geodesy.

C.5.1. Reweighted estimates: Mean effects

Table A.9 shows reweighted estimates of the policy announcements on expectations for the full sample of respondents. The magnitude of coefficient estimates slightly varies in comparison to the unweighted estimates in Table 2, for instance, the first press conference shifted expectations about the end of all restrictions by 30 days in the weighted model rather than by 25 days in the unweighted case, based on the main specification (column 3).

Overall, effect sizes and statistical significance of the weighted and the unweighted estimates are similar for the question on general restrictions and the football Bundesliga.

| Note: Civey Online Panel, April 2-May 27, 2020. Table shows the change in the expected duration in days associated with each of the three public announcements, assuming 20% of respondents were inattentive and chose answers randomly. Columns 1/4/7 show estimates from bivariate OLS on a binary indicator that takes on 0 if the outcome was measured before the event and 1 if it was measured after the event. Columns 2/5/8 show multivariate OLS estimates with a global linear time trend centered at zero at the event interacted with the before/after indicator. Columns 3/6/9 present multivariate local linear polynomial regression discontinuity estimates. Covariates include gender (male/female), education (university/other), age (below/above 50), children in household (yes/no), region (northwest/south/east), population density (high/low), purchasing power (high/low), political party preference (Union/FDP, Red/Red/Green, AfD, Other) and county-level quartile of COVID-19 new infection rate. MDV = mean dependent variable measured before the event. S.D. = baseline standard deviation in days. Estimation with standard errors clustered at the person-level. * p < 0.05, ** p < 0.01, *** p < 0.001. |

| Note: Civey Online Panel, April 2-May 27, 2020. Table shows the change in the expected duration in days associated with each of the three public announcements. Columns 1/4/7 show estimates from bivariate OLS on a binary indicator that takes on 0 if the outcome was measured before the event and 1 if it was measured after the event. Columns 2/5/8 show multivariate OLS estimates with a global linear time trend centered at zero at the event interacted with the before/after indicator. Columns 3/6/9 present multivariate local linear polynomial regression discontinuity estimates. Covariates include gender (male/female), education (university/other), age (below/above 50), children in household (yes/no), region (northwest/south/east), population density (high/low), purchasing power (high/low), political party preference (Union/FDP, Red/Red/Green, AfD, Other) and county-level quartile of COVID-19 new infection rate. MDV = mean dependent variable measured before the event. S.D. = baseline standard deviation in days. Estimation with standard errors clustered at the person-level. * p < 0.05, ** p < 0.01, *** p < 0.001. |

Table A.8
Estimation results: Sensitivity to 20% inattentiveness rate.

| 1st Press Conference | 2nd Press Conference | 3rd Press Conference |
|----------------------|----------------------|----------------------|
| All restrictions     |                      |                      |
| MDV (pre-event)      |                      |                      |
| S.D. (pre-event)     |                      |                      |
| School closures      |                      |                      |
| MDV (pre-event)      |                      |                      |
| S.D. (pre-event)     |                      |                      |
| Bundesliga           |                      |                      |
| Covariates           |                      |                      |
| Time trend           |                      |                      |

Table A.9
Estimation results: Expectation updating in response to new COVID-19 announcements.
Table A.10
Heterogeneity: Expectation updating in response to new COVID-19 announcements.

|                         | 1st Press Conference | 2nd Press Conference | 3rd Press Conference |
|-------------------------|----------------------|----------------------|----------------------|
|                         | All (1)             | School (2)           | BL (3)               | All (4)             | School (5)           | BL (6)               | All (7)             | School (8)           | BL (9)               |
| **Demographic variation** |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| Women                   | 32**                | 17*                  | –35*                 | 11                   | 21                   | 7                    | 52**                | 11                   | –104*                |
| Men                     | 27**                | –20                  | –61**                | 17                   | 21                   | –13                  | 18                   | 20                   | –59                  |
| University              | 27**                | –20                  | –61**                | 17                   | 21                   | –13                  | 18                   | 20                   | –59                  |
| No university           | 31**                | –2                   | –18                  | 8                    | –15                  | –46                  | 47**                | –15                  | –73                  |
| Age: < 40               | 32**                | –19                  | –45                  | 17                   | 30                   | –291                 | 51                   | –86                  | –121                 |
| Age: 40-64              | 30**                | 18*                  | 33*                  | 6                    | 3                    | –9                   | 30**                | 13                   | –53                  |
| Age: 65+                | 33**                | –11                  | –435                 | –2                   | –20                  | –7                   | 55**                | 25*                  | –39                  |
| Children in HH          | 34**                | 30*                  | –53                  | 20                   | 18                   | –99                  | 32                   | –3                   | –121*                |
| No children             | 28**                | 4                    | –37                  | 9                    | 3                    | –13                  | 35**                | 4                    | –60                  |
| Political pref.: Union/FDP | 33**            | 5                    | –46                  | 23*                  | –5                   | –45                  | 49***               | –3                   | –39                  |
| Political pref.: RRG    | 33**                | 5                    | –46                  | 23*                  | –5                   | –45                  | 49***               | –3                   | –39                  |
| **Geographic variation** |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| Region: North/West      | 21**                | –3                   | –45                  | 7                    | 16                   | –52                  | 36**                | 29                   | 9                    |
| Region: South           | 32**                | 9                    | –51                  | 16                   | 3                    | –53                  | 34*                 | –38                  | –101*                |
| Region: East            | 35**                | 29*                  | –12                  | 3                    | 6                    | 34                   | 31                   | 30                   | –138**               |
| Pop. Density: High      | 24*                 | –2                   | –31                  | 16                   | 22                   | –16                  | 35*                 | 1                    | –60                  |
| Pop. Density: Low       | 32**                | 15                   | –45*                 | 8                    | 2                    | –44                  | 34*                 | 12                   | –83*                 |
| Purch. Power: High      | 28**                | 0                    | –65                  | 9                    | 8                    | –43                  | 41**                | –33                  | –44                  |
| Purch. Power: Low       | 30**                | 16                   | –15                  | 13                   | 12                   | –35                  | 25                   | 35                   | –86*                 |
| **By COVID-19 exposure** |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| New cases/ state: < P25 | 74***               | 21                   | –137*                | –8                   | 10                   | –49                  | –11                  | 13                   | –44                  |
| New cases/ state: P25-P50 | 50***           | 44***                | –0                   | 29                   | –20                  | 34                   | 53*                 | –1                   | –93                  |
| New cases/ state: P50-P75 | 23*               | 6                    | –13                  | –1                   | 18                   | –14                  | 31                   | 57                   | –81                  |
| New cases/ state: > P75 | 21**                | 1                    | –52                  | 12                   | 6                    | –63*                 | 31*                 | –16                  | –63                  |

Note: Civey Online Panel, April 2-May 27, 2020. Table shows the change in the expected duration in days associated with each of the three public announcements for various subgroups. Coefficient estimates from local polynomial regression discontinuity estimation, adjusted for gender (male/female), education (university/other), age (below/above 50), children in household (yes/no), region (northwest/south/east), population density (high/low), purchasing power (high/low), political party preference (Union/FDP, Red/Red/Green, AfD, Other) and county-level quartile of COVID-19 new infection rate. Estimation adjusted for population weights with standard errors clustered at the person-level. * p < 0.05, ** p < 0.01, *** p < 0.001.

Table A.11
Effect of the press conferences on undecided and extreme responses (LPM).

|                             | 1st Press Conference | 2nd Press Conference | 3rd Press Conference |
|-----------------------------|----------------------|----------------------|----------------------|
|                             | All (1)             | School (2)           | BL (3)               | All (4)             | School (5)           | BL (6)               | All (7)             | School (8)           | BL (9)               |
| A. Don't know               | 0.02**              | 0.06***              | 0.08***              | 0.00                | 0.02                | –0.07*               | 0.01                | 0.02                | 0.04                |
|                             | (0.01)              | (0.01)               | (0.02)               | (0.01)              | (0.02)              | (0.04)               | (0.01)             | (0.02)              | (0.03)              |
| MV (pre-event)              | 0.05                | 0.05                 | 0.16                 | 0.08                | 0.08                | 0.20                 | 0.08                | 0.08                | 0.16                |
| N                           | 17,671              | 4,581                | 4,560                | 10,763              | 3,227               | 3,274                | 15,545              | 3,841               | 4,024               |
| B. Will never end           | 0.01                | 0.01                 | –0.02                | –0.06***            | 0.00                | –0.03                | –0.01               | –0.02               | –0.06**             |
|                             | (0.01)              | (0.01)               | (0.02)               | (0.01)              | (0.01)              | (0.02)               | (0.01)             | (0.01)              | (0.02)              |
| MV (pre-event)              | 0.06                | 0.01                 | 0.06                 | 0.12                | 0.02                | 0.07                 | 0.12                | 0.02                | 0.09                |
| N                           | 17,671              | 4,581                | 4,560                | 10,763              | 3,227               | 3,274                | 15,545              | 3,841               | 4,024               |

Note: Civey Online Panel, April 2-May 27, 2020. Linear probability models with the dependent variables indicating if individuals say they do not know when restrictions will end (Panel A) or if they say they will never end (Panel B). Coefficient estimates from multivariate local polynomial regression discontinuity estimation with local linear time trends. Estimation with standard errors clustered at the person-level in parentheses. MDV = mean dependent variable measured before the event. * p < 0.05, ** p < 0.01, *** p < 0.001.

For school closures, the magnitude of coefficients is also similar but the effect of the first press conference does not pass the threshold of statistical significance in the main specification of the weighted model. In comparison to the question on general restrictions, the sample size for the question on school restrictions is notably smaller and, hence, is more strongly affected by dispersed survey weights which reduce the effective sample size, one disadvantage of reweighting procedures.

C.5.2. Reweighted estimates: Heterogeneous effects
We present reweighted estimates of heterogeneous treatment effects in Table A.10. Results are similar to unweighted estimates in Table 3, with low heterogeneity in belief-updating across subgroups.

Appendix D. Uncertainty in beliefs

D.1. Undecided and extreme responses
See Table A.11.

D.2. Second moment analysis
See Fig. A.8.
Appendix E. Expectations of managers and individuals

In this section, we present additional results based on the ifo Manager Survey, where we introduced similar questions about the expected duration of the pandemic. In contrast to the online survey of individuals conducted by Civey, the ifo Manager Panel does not provide responses on a daily basis but is only conducted once a month. Therefore, we lack variation to estimate the impact of policy communication on manager expectations for individual press conferences. However, we can compare the overall level and the change of expectations between managers and individuals in early April - that is, before the three press conferences - and in late May - that is, after the three press conferences. We find strong similarity in both level and time trend of individual and manager expectations around the time of the three press conferences.

E.1. ifo Manager Survey

The ifo Institute collects information about the expectations of managers of firms through various surveys. For this paper, we conducted two special surveys as part of the ifo Manager Survey (see Demmelhuber and Garnitz (2019) for more information on the survey). This survey is sent out online to about 500 managers from different companies in all major industries in Germany using the SoSci Survey platform. We included special questions in the waves in April (conducted between April 6 and 19) and May (conducted between May 25 and June 2). The response rates were 322 in the April wave and 310 in the May wave.

In both waves of the ifo Manager Survey, we introduced the following expectation questions related to restrictions due to Corona:

1. When will public life have fully normalized?
2. When will the majority of school children be back in school?
3. When will the main football league return to normal operations with stadium visitors?
4. When will travel restrictions be lifted?
5. When will the situation of the German economy have normalized?
6. When will the situation of your company have normalized?
E.2. Manager expectations

Fig. A.9 shows the average answers to these six questions - again translated to calendar dates for both waves\textsuperscript{24}. For all six questions, the answers after the third press conference are (significantly) more pessimistic than those before the first one, suggesting that managers strongly updated their beliefs about the duration of the pandemic between early April and late May 2020.

\textsuperscript{24} Note that for the first wave, we only use the 306 observations that responded before the first press conference on April 15.

E.3. Comparison of individual and manager expectations

Fig. A.10 and Table A.12 compare the answers of individuals and managers to the three common questions. Baseline expectations
Fig. A.10. Comparison of household and manager expectations. Notes: Coefficients from multivariate OLS with 95%-C.I.; Data source: Civey Online Panel and ifo Manager Panel 2020.

Table A.12
Comparison of households’ and managers’ expectations.

| MDV (pre) | MDV (post) | Δ (pre/post) BV | Δ (pre/post) MV | N |
|-----------|------------|-----------------|-----------------|----|
| Aug 20    | Dec 20     | Aug 20          | May 20          | 3,294 |
| Jan 21    | May 21     | May 20          | Aug 20          | 489  |
| May 20    | Aug 20     | Aug 20          | Aug 20          | 1,459 |
| May 20    | Sep 20     | May 20          | May 20          | 491  |
| Oct 20    | Feb 21     | Oct 20          | Oct 20          | 1,236 |
| Sep 20    | Dec 20     | Sep 20          | Sep 20          | 479  |

Notes: Civey Online Panel 2020 for household (HH) expectations and Manager Panel (MP) 2020 for firm expectations. Table shows mean expectations before (MDV pre = April 6–8) and after (MDV post = May 25–27) the three press conferences, as well as coefficient estimates for the change in expectations over time (in days), using bivariate OLS (Δ BV) and multivariate OLS (Δ MV). All estimates with standard errors clustered at the person level in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001.

Fig. A.11. Mobility behavior in 2020 relative to pre-year. Notes: Plot shows the holiday-adjusted mobility in Germany in 2020 relative to 2019, based on aggregate mobile communications data. Data source: Destatis Mobility Indicators.
Estimation results: Mobility behavior relative to pre-year.

Note: Destatis Mobility Indicators. 2020. Table shows the change in holiday-adjusted mobility relative to pre-year mobility in percentage points associated with each of the three public announcements. Regressions are obtained using binned daily data. Coefficient estimates from bivariate regression discontinuity estimation with global linear trend. Standard errors in parentheses. *p < 0.05, **p < 0.01, ***p < 0.001.

about the end of restrictions are very similar for the question on school closures and the German football league, but differ for the expected end of all restrictions. Here, it is worth noting that the question on general restrictions was phrased differently for managers and individuals, whereas the wording was identical for the other two questions, which may partially explain the observed discrepancy. Belief updating between early April and late May does not significantly differ between individuals and managers for any of the three expectation questions.

Appendix F. Behavioral effects: Mobility

F.1. Mobility patterns during the pandemic

See Fig. A.11.

F.2. Mobility effects of the three press conferences

See Fig. A.12 and Table A.13.

References

Archel, K., Ron-Levey, I. 2020. Trust in government lacking on COVID-19’s frontlines, Gallup blog, 20 March 2020. URL: https://news.gallup.com/opinion/gallup/296594/trust-government-lacking-frontlines-covid.aspx (accessed 20 August 2021).
Baele, L., Bekker, G., Cho, S., Inghelbrecht, K., Moreno, A. 2015. Macroeconomic regimes. J. Monetary Econ. 70, 51–71.
Bartik, A.W., Bertrand, M., Cullen, Z., Glaeser, E.L., Luca, M., Stanton, C. 2020. The impact of COVID-19 on small business outcomes and expectations. Proc. Nat. Acad. Sci. 117 (30), 17656–17666.
Becker, O., Lettnier, J., Leopold-Wildburger, U., 2009. Expectation formation and regime switches. Exp. Econ. 12 (3), 350–364.
Bénabou, R., Tirole, J., 2016. Mindful economics: The production, consumption, and value of beliefs. J. Econ. Perspect. 30 (3), 141–164.
Buchheim, L., Doern, J., Kroll, C., Link, S. 2022. Sentiment and firm behavior during the COVID-19 pandemic. J. Econ. Behav. Organ. 195, 186–198.
Calonico, S., Cattaneo, M.D., Titunik, R. 2014. Robust nonparametric confidence intervals for regression-discontinuity designs. Econometrica 82 (6), 2295–2326.
Coibion, O., Gorodnichenko, Y., Weber, M. 2020a. Does policy communication during COVID work? Covid Papers 29, 1–49.
Coibion, O., Gorodnichenko, Y., Weber, M. 2020b. How Did U.S. Consumers Use Their Stimulus Payments?, NBER Working Papers 27693, National Bureau of Economic Research, Inc. URL: https://ideas.repec.org/p/nber/wber/27693.html.
Coibion, O., Gorodnichenko, Y., Weber, M. 2022. Monetary policy communications and their effects on household inflation expectations. J. Polit. Econ. forthcoming.
D’Acuto, F., Hoang, D., Weber, M. 2022. Managing Households’ Expectations with Unconditional Policies. Rev. Financ. Stud. forthcoming.
Demmelhuber, K., Garnitz, J., 2019. ifo Managerbefragung: Investitions- und Beschäftigungspläne der Unternehmen für 2019. ifo Schnelldienst 72 (02), 62–65.
Druckman, J., Holmes, J., 2004. Does presidential rhetoric matter?: Priming and presidential approval. President. Stud. Quart. 34, 735–778.
Dustmann, C., Fitztegger, B., Schönburg, U., Spitz-Oener, A. 2014. From sick man of Europe to economic superstar: Germany’s resurgent economy. J. Econ. Perspect. 28 (1), 167–188. URL https://www.aeaweb.org/articles?id=10.1257/jep.28.1.167.
Fetzer, T., Hensel, L., Hermlie, J., Roth, C. 2020. Coronavirus perceptions and economic anxiety. Rev. Econ. Stat., 1–36
Firpo, S., Fortin, N.M., Lemieux, T. 2009. Unconditional quantile regressions. Econometrica 77 (3), 953–973.
Galasso, V., Pons, V., Profeta, P., Bercher, M., Brouard, S., Foucault, M. 2020. Gender differences in COVID-19 attitudes and behavior: Panel evidence from eight countries. Proc. Nat. Acad. Sci. 117 (44), 27285–27291. URL https://www.pnas.org/content/117/44/27285.
Gelma, A., Imbens, G. 2019. Why high-order polynomials should not be used in regression discontinuity designs. J. Business Econ. Stat. 37 (3), 447–456.
Goldberg, M., Gustafson, A., Maibach, E., Ballew, M.T., Bergquist, P., Kotcher, J., Marlon, J.K., Rosenhal, S., Leiserowitz, A. 2020. Mask-wearing increases after a government recommendation: A natural experiment in the US during the COVID-19 pandemic.
Hatcher, W., 2020. A failure of political communication not a failure of bureaucracy: The danger of presidential misinformation during the COVID-19 pandemic. Am. Rev. Public Administ. 50 (6–7), 614–620.
Lenz, G.S., Lawson, C., 2011. Looking the part: Television leads less informed citizens to vote based on candidates’ appearance. Am. J. Polit. Sci. 55 (3), 574–589.
Nakamura, E., Steinsson, J. 2018. High-Frequency Identification of Monetary Non-Neutrality: The Information Effect. Q. J. Econ. 133 (3), 1283–1330. https://doi.org/10.1093/qje/qjy004.
Newton, K., 2020. Government communications, political trust and compliant social behaviour: The politics of COVID-19 in Britain. Polit. Quart. 91 (3), 502–513.
Rivot, S. 2017. Economic policy as expectations management: Keynes’ and Friedman’s complementary approaches. Eur. J. History Econ. Thought 24 (5), 1053–1064.
Shannon, H., Berning, C. 2020. Attention check items and instructions in online surveys with incentivized and non-incentivized subjects: Boon or bane for data quality? Survey Res. Methods 14 (1), 55–77.
Tedin, K., Rottinghaus, B., Rodgers, H., 2021. When the president goes public. Polit. Res. Quart. 64 (3), 506–5190.
Terkourafi, M. 2008. Toward a unified theory of politeness, impoliteness, and rudeness. In: Derek Bousfield, Miriam A. Locher (Eds.), Impoliteness in Language: Studies on its Interplay with Power in Theory and Practice, pp. 45–74.