

# Framing Effects in teh Wild: How the News Media Shapes Public Opinion by Defining Political Issuest

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Nicolai Berk



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## Abstract

Scholars heavily debate the importance of the news media for opinion formation. Despite a large body of research, important open questions remain: First, existing evidence is mostly uninformative about the everyday influence of newspaper *content* on public opinion, focusing on the rare case of exposure to different outlets. Second, it was so far not addressed how predispositions shape individual responses to news content in the real world. I address both issues exploiting a rare shift in the migration coverage of the major German tabloid newspaper *Bild*. I combine panel data from over 15,000 individuals with content analysis of 2.5 million newspaper articles using BERT models. The results show that a moderate increase in the emphasis of crime in migration coverage substantially affects immigration attitudes, but only among individuals who do not already associate immigration with crime. These findings show that media outlets hold substantial power to shape public opinion in contemporary democracies and bring to attention the importance of predispositions in shaping individual reactions to news content.

.footnote[t: I am thankful for comments on earlier stages of this draft from Elias Dinas, Heike Klüver, Thomas M. Meyer, as well as participants in the Dynamics, EPSIP, and UNDA Colloquia at HU Berlin, CIVICA EGN Workshop at the EUI Florence, and the Political Behaviour Section at Aarhus University.]

# 1 Introduction

The persuasiveness of the news media has been a fixation of research on political communication and public opinion for at least the past 100 years. Nearly as long has the debate moved back and forth on whether the news media is the major source of citizens' political attitudes. In recent years, this question has increasingly been addressed by observational research employing causal identification strategies, as well as large-scale field experiments (Broockman and Kalla 2022; Foos and Bischof 2022; Grossman, Margalit, and Mitts 2022; Guess et al. 2021; Martin and Yurukoglu 2017; Spirig 2020).

Despite this growing body of research, important gaps persist. First, research in this field has studied somewhat rare occurrences like news boycotts (Foos and Bischof 2022), fundamental changes in the makeup of news media markets (Durante and Knight 2012; Grossman, Margalit, and Mitts 2022; Martin and Yurukoglu 2017), or exposing (partisan) news consumers to outlets with opposing viewpoints (Broockman and Kalla 2022; Guess et al. 2021). These studies give us a better understanding of the big picture of media landscapes, how they affected today's political landscape, and inform about the implications of highly partisan media. However, they tell us little about the everyday role of the news media in their consumers' opinion formation process.

Second, while all these studies have convincingly estimated the average effect of the consumption of a specific, usually partisan news outlet in a specific setting, they have mostly not assessed which scope conditions underlie this effect (Chiang and Knight 2011; Spirig 2020 for exceptions). Experimental research has however shown that the effects of exposure to specific content are dependent on individuals predispositions (**Chong2007?**; Druckman and Leeper 2012; Zaller 1992). An important gap is therefor how different individual predispositions condition reactions to specific news content in the real world.

I address both gaps in the literature by presenting evidence from an editorial change in the largest German tabloid *Bild*, resulting in an increasing emphasis of crime in the paper's migration coverage. The case is ideal to assess the everyday influence of news outlets to shape public opinion, as the change in editorship and **content** itself was not salient. This means that the estimated effect can only be attributed to the actual change in **content** (see Spirig 2020 for a discussion of this issue). By employing BERT models for the precise measurement of newspaper content in a corpus of 2.5 million newspaper articles, I provide a clear definition of the treatment - something that is usually left to experimental studies. The coupling with a large-scale panel survey of over 15,000 individuals



allows the assessment of heterogeneous effects across subgroups.

The results show that the news media has substantial influence on citizens' political attitudes. By changing the emphasis of different aspects of an issue, newspapers can shift citizens' opinions even on highly salient and emotional issues such as immigration. This has important implications for our understanding of contemporary democracies, as it underlines the crucial role of the media in the definition of political issues.



Furthermore, this effect is dependent on the pre-existing opinion towards an issue. Citizens who are likely to associate migration with crime preceding the treatment do not react to an increasing association of immigration with crime, while those with initially liberal attitudes change their views. This finding underlines the importance of assessing heterogeneous treatment effects in media effects studies and contributes to the literature on emphasis framing in competitive contexts.

The paper will proceed as follows: in the next section I will briefly discuss the media effects literature, before describing the theoretical framework and research design, including case, measurement, and estimation strategy. The results section will then showcase findings from difference-in-differences and fixed-effect models assessing the hypotheses formulated in the theoretical framework, as well as some supporting descriptive statistics. Lastly, I discuss the wider implications of the findings for the study of media effects and the role of the news media in contemporary democracies.

## 2 The Study of Media Effects on Public Opinion

The study of the effect of media content on political attitudes was long dominated by a large body of experimental research. Especially research on framing has established that even minor changes in the media content strongly affect individuals' answers to questions regarding their political attitudes (Busby, Flynn, and Druckman 2019; Druckman 2001; Leeper and Slothuus 2020; Nelson, Clawson, and Oxley 1997; Sniderman and Theriault 2004).

These studies were criticized from two sides. First, it was argued that the diversification and increasingly partisan nature<sup>1</sup> of contemporary news environments enable consumers to select into media outlets in line with their ideological pre-

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<sup>1</sup>At least in the United States.

dispositions. This would make exposure to contradicting arguments and frames - and hence the effects of media consumption in general - unlikely (Bennett and Iyengar 2008). Second, the external validity of experiments in political science was questioned more generally (Barabas and Jerit 2010), especially with regard to the persistence of framing effects across time and with exposure to contradicting frames (Lecheler and De Vreese 2011; Druckman and Leeper 2012).

A more recent body of research has used quasi-experimental designs and field experiments to address these concerns. The observational literature has usually exploited changes in news media markets such as boycotts of certain outlets (Foos and Bischof 2022), entries of new outlets (DellaVigna2007?; Grossman, Margalit, and Mitts 2022), changing TV channel positions (Martin and Yurukoglu 2017), or partisan takeovers of news outlets (Durante and Knight 2012; Spirig 2020) to estimate the effects of changing news exposure on political behavior. Interestingly, the results differ across studies. While some studies find substantial effects of exposure to slanted media on political attitudes and voting behavior even in the long run (Foos and Bischof 2022; Grossman, Margalit, and Mitts 2022), others find that consumers switch outlets when the slant of currently consumed news changes (Durante and Knight 2012; Spirig 2020).

Another approach is to assess consumer reactions to news content through field experiments. In this setup, consumers are randomly assigned to specific news outlets and the development of their political attitudes is assessed. Guess et al. (2021), for example, randomly assigned individuals to receive content from a left-leaning or a right-leaning news outlet in their online news feeds. Similar studies have assessed the effects of cross-partisan content on TV (Broockman and Kalla 2022) and social media (Bail et al. 2018). This literature provided contradicting results as well: while some found liberalizing effects of liberal content (Broockman and Kalla 2022), others found null effects (Guess et al. 2021), or even partisan backlash (i.e. individuals becoming even more conservative in response to liberal content; Bail et al. (2018)).

Despite this wealth of evidence, no consensus regarding the importance of news media content for opinion formation could be reached so far. I argue this is the case for two reasons. First, existing research provides little insight into the most common case of changing news diets: the changing content in consumed outlets. By focusing on the effects of the consumption of different *outlets*, the literature studies a process unlikely to be observed in the real world - after all, changes in the makeup of media markets are extremely rare and switches

from one partisan outlet to an opposing partisan outlet even more so. *The main influence of news editors on public opinion should be exercised by editing the everyday content of news, rather than changing the consumer base of their outlets.*

Estimating effects of exposure to specific *outlets* rather than specific *content* also has implications for the conceptual understanding of the treatment. Experimental research suggests that consumers associate news from certain outlets with a specific slant, independent of the actual content (Baum and Gussin 2008). Additionally, individuals might develop a trusting relationship with their chosen source of news, meaning that they consider an argument raised by this outlet, but not others. Overall, this means that by assigning individuals to consume different outlets - especially from across the partisan divide - it is impossible to assess whether (the absence of) attitudinal changes can be attributed to the actual content in these outlets or individual expectations about the content of these outlets.

Often, there are additional contextual confounders, dependent on the method of study. In observational studies, this could mean that a highly visible change in a media market affects viewers response to content changes, for example when a politician buys a news outlet (see Spirig 2020 for an exemplary discussion). Field experiments might affect respondents' political knowledge and attitudes simply by exposing citizens to political content (Barabas and Jerit 2010). This would add further treatments to the mere change in news coverage.

Lastly, differences in the findings of similar studies might be the result of studying different populations. Individuals react to news content in different ways, dependent on their predispositions (Druckman and Leeper 2012; Zaller 1992). However, as a result of either a lack of individual level data or small sample sizes, current studies focus on average effects, rather than assessing how different individuals might be affected by changing news content. This focus likely masks the differential impact of news exposure on different subgroups. This also means that differing findings in the existing literature might result from a focus on different populations (e.g. partisans).

To summarize, the current literature is focused on the study of the average impact of consuming different news outlets on a population. However, this focus studies a least observable case, is not informative about effects of changing news *content* and does not incorporate that predispositions condition individual reactions to such changes. To contribute to a better understanding of how content and predisposition interact in the opinion formation process, I focus on the identification of the effect of a within-outlet change in news content,

and exploit a large-scale panel survey to assess how predispositions structure reactions to such content.

### 3 Emphasis Framing and its Limits

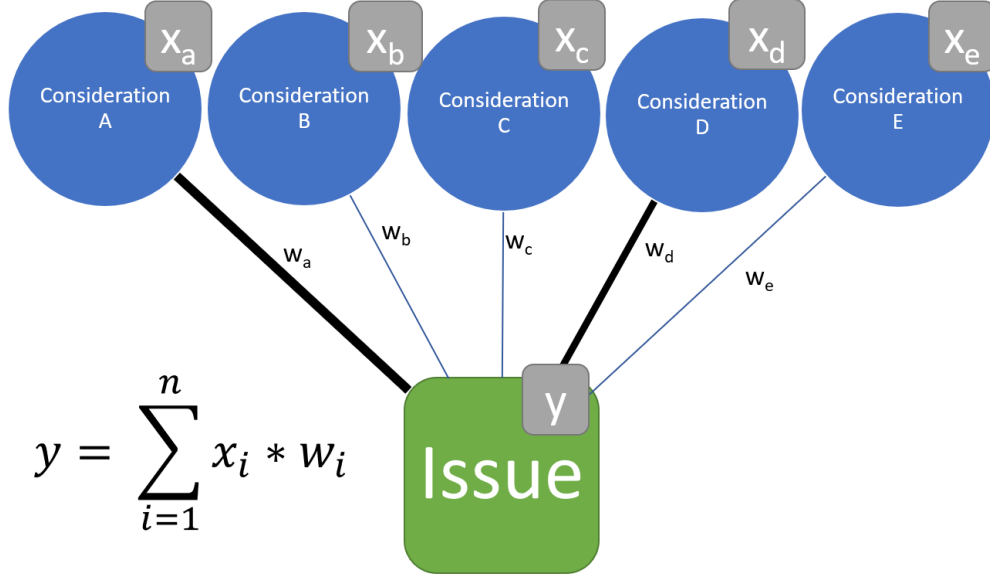


Figure 1: The cognitive evaluation of an issue  $y$  is determined by the strength of association  $w_i$  with other concepts with existing evaluations  $x_i$ .

To hypothesize how changes in news content should affect political attitudes and how this effect is conditioned by individual predispositions, I build on the *expectancy-value model* (Ajzen and Fishbein 2000), often employed in research on emphasis framing (Nelson, Clawson, and Oxley 1997; Leeper and Slothuus 2020). This model suggests that an attitude on a given issue is a function of two things: considerations relating to that object and their respective weights. The evaluation of the issue is subdivided into a number of considerations, which will carry clear evaluations. For example, to form an opinion about whether immigration to one's country should be restricted, a person might consider the humanitarian conditions in the countries of origin (negative consideration regarding restrictive migration policy), as well as the risk of increased crime (positive consideration; note that the model does not differentiate whether a consideration is grounded in objective reality). Individuals weigh each of these considerations to form an overall opinion on the subject.

Figure 1 visualizes this logic. A given issue is associated with an attitude  $y$ . The issue is related to a number of different considerations, each of which carries an associated evaluation  $x_i$ , e.g. that crime is bad. Each of these considerations is more or less associated with the issue. Based on the strength of this association  $w_i$ , a given consideration's evaluation is more or less reflected in the issue evaluation  $y$ , which is equal to the weighted sum of considerations.

According to this model, there are three major ways in which opinions could be changed. First, the association of a single consideration with the issue could be increased. As a result, a specific consideration factors more prominently in an individuals' attitude formation process. Second, the set of available considerations might be changed. This way, a positive consideration about an issue could be added to the available set, or replaced with a negative one. Lastly, an individual will judge how applicable a consideration is to the issue at hand. Some associations might simply not make sense to an individual or could be perceived as politically motivated and hence rejected<sup>2</sup>.



The first option - opinion change through changing the weight of considerations - is the phenomenon commonly studied in emphasis framing research by exposing individuals to considerations and assessing attitudinal changes in the very short term. Changing accessibility of available considerations in the active reasoning process is arguably a rather short-term process, as effects of a single exposure will wear off over time (Lecheler and De Vreese 2011). The present study is however concerned with framing effects in the medium term of weeks or months. Here, permanently increased emphasis of one aspect of an issue is more likely to work through the second mechanism, that is, by changing the set of available considerations stored in memory: “[r]epeated exposure to a frame in communication [...] induces frequent processing, which in turn increases accessibility” (Chong2007JoC?). This might happen directly through exposure, but opinions might also change through the last mentioned mechanism, which changes the applicability of a consideration to an issue.

If we imagine a news consumer confronted with an increased volume of news about criminal migrants, the consumer could change their assessment of the appropriate restrictiveness of migration policy by either adding crime to the set of available considerations to evaluate migration, such that it automatically

<sup>2</sup>There is a fourth option to change opinions, namely by changing the evaluation of a certain consideration. Given the limited relevance for a strictly negative consideration like crime (it is hard to imagine an argument that crime is actually good), and the complexity associated with this option, I omit it from my discussion and assume that considerations have a fixed evaluation for the remainder of the paper.



comes to mind when thinking about migration; or by learning that crime is an important consideration when it comes to the evaluation of migration policy, although they rejected the consideration before. This could for example be the overcoming of resistance to a frame that conflicts with one's attitudes. E.g. a reader with liberal immigration attitudes might reject the crime frame because they deem it politically motivated. This is particularly relevant when receiving the frame from a political actor (**Slothuus?**; **Druckmann?**). For example, the liberal news consumer could reject the crime consideration when it comes from a right-wing outlet like Fox News, viewing the argument as politically motivated, but take the argument more seriously coming from a liberal outlet like CNN. This highlights the importance of studying the effects of within-outlet changes of news framing.

To summarise, I expect news frames to affect opinions in one of two ways in the medium term: a) by changing the set of available considerations or b) by making the consideration applicable to the issue at hand. This also has implications for who is likely to react to changing news framing. As (**Chong2007?**) write: "Diffusion of a strong frame for an issue can increase the *chronic accessibility* of a consideration. To the extent that this consideration is readily available when an issue is raised - without prompting - framing effects will be diminished."

This is a profound point: those individuals already strongly associating consideration with an issue by default when exposed to a frame will be less likely to react *as the consideration raised by the frame will already feature prominently in their assessment of the issue*. The set of available considerations will remain unaffected. In the example of the news consumer exposed to an increasing amount of migration framing emphasizing crime, this would mean that the exposure only had an effect if the crime frame does not already feature prominently in their assessment of the issue.

**Association hypothesis:** Increased exposure to positive/negative considerations about an issue results in more positive/negative attitudes about the issue.

**Availability hypothesis:** Individuals are less likely to change their issue attitudes when exposed to considerations that are already strongly associated with their evaluation of the issue.



## 4 Research Design

### 4.1 The Case



In order to test whether changing news content - rather than a shift in the consumed news outlet - affected political attitudes, I exploit an editorial change in the largest German tabloid newspaper, *Bild*. This editorial change resulted in a substantial shift in the papers' migration framing and is hence ideal to assess the effect of within-newspaper content shifts. Additionally, the fielding of a large-scale panel survey in the same period allow to assess the impact of news content on migration attitudes and how predispositions condition this effect. I will briefly discuss the context of the case in this section.

In the summer of 2015, Germany became sanctuary for around 800,000 refugees who had fled war, violence, and famine in Syria and elsewhere. The German public debated how to deal with the newly arriving and for the first time since the post-war years, a radical right party was likely to win representation in the national parliament. Surprisingly, given its traditional populist style and right-wing takes on migration, the major tabloid newspaper *Bild* promoted an open stance towards the newly arriving in this period. This was often connected to chief editor Kai Diekmann, who himself hosted a refugee family in his home (Reichelt 2015).

The migration coverage severely changed when Diekmann left the newspaper in February 2017 and Julian Reichelt took over the position as chief editor. The paper increasingly started painting a picture of refugees as criminals on the tabloid's front page (Niggemeyer 2018; Zudeick 2018). Headlines like "I killed 40 people and want asylum" increasingly dominated the migration coverage of the newspaper. In a speech months before he took over the position as chief editor, Reichelt outlined his motivation for such a shift in migration coverage: "I can assure you: nothing has hurt [*Bild*] economically as much as our clear, humane, empathetic stance in the refugee crisis" <sup>3</sup>. He also argued that the German media shows too little tolerance towards anti-immigration attitudes and therefor excludes those holding such views from the political discourse.

This presents a unique case to study the effects of media content on public opinion. As outlined above, past observational studies have usually explored the effect of consuming a new/different news outlet, without assessing the precise shift in content. In this case, the shift in content took place *within*

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<sup>3</sup>Reichelt in a speech at \*Deutschlandfunk\*'s conference "Formate des Politischen 2016": <https://vimeo.com/190347766>

the outlet and can be clearly identified. The change of editor itself was not salient, which means any opinion changes among readers are most likely the result of the content (Spirig 2020). In summary, *this case is as close as possible to a field experiment in which a specific consideration of migration coverage is amplified in the coverage of one newspaper, but not others.*

I exploit this communicative shift in the tabloid’s migration coverage with a difference-in-differences design to answer the question how much influence the news media has to shape public opinion. Compared to the experimental setting, this can tell us with high external validity how news content affects political attitudes in contemporary news environments, in the medium term, in the real world.

The setting more generally represents a least-likely case for the observation of media effects. The migration issue had been salient for one and a half years preceding the takeover, and opinions are likely chrystalized. The polarized nature of the topic should make it less likely that citizens will incorporate new information (Taber and Lodge 2006; Zaller 1992). Additionally, Germany had a large debate about refugees and crime after the new year’s eve 2015 in Cologne. According to a report of the ministry of interior in Northrhine-Westphalia, hundreds of women were sexually assaulted and robbed by men they perceived to be of “north-african/arabic” descent <sup>4</sup>. This debate could serve as ‘pre-treatment’ and as such prevent further attitudinal change (Druckman and Leeper 2012). Lastly, the political parties in Germany had taken clear and visible positions on migration, providing citizens with strong party cues from which they could infer positions in case they didn’t hold strong attitudes themselves (Slothuus and Bisgaard 2021).

## 4.2 Measurement

### 4.2.1 Measuring news attention to migration

To measure media attention to immigration, I collected 2.5 million newspaper articles from the most important German broadsheets *Frankfurter Allgemeine Zeitung (FAZ)*, *Spiegel Online (SPON)*, *Süddeutsche Zeitung (SZ)*, *Die Tageszeitung (TAZ)*, *Die Welt* and the major German tabloid *Bild* for the period 2013-2019. Table 1 shows the number of print copies sold and online page impressions for each newspaper per day. The tabloid *Bild* has by

<sup>4</sup>see report of the ministry of interior in Northrhine-Westphalia: [https://web.archive.org/web/20160116104020/http://m.mik.nrw.de/fileadmin/user\\_upload/Redakteure/Dokumente/Themen\\_und\\_Aufgaben/Schutz\\_und\\_Sicherheit/160111ssia/160111berppkoeln.pdf](https://web.archive.org/web/20160116104020/http://m.mik.nrw.de/fileadmin/user_upload/Redakteure/Dokumente/Themen_und_Aufgaben/Schutz_und_Sicherheit/160111ssia/160111berppkoeln.pdf)

far the largest reach, closely followed by the weekly published *Spiegel*. The daily broadsheets sell less, and interestingly the online presence seems to be dominated by the right, given the weak presence of centre-left *SZ* and *taz*.

Paper	Print Sales (thousands)	Web Impressions (millions)
Bild	1756	555
Spiegel	758	388
FAZ	242	123
SZ	358	13
taz	51	7
Welt	521	135

Table 1: Average daily sales and online impressions of different newspapers in 2017. Source: Informationsgemeinschaft zur Feststellung der Verbreitung von Werbeträgern e. V. (2021). Quartalsauflagen. <https://ivw.de/aw/print/qa>. Table generated with stargazer.

To identify whether an article is about migration, a research assistant annotated 1800 articles. As migration content is rare, and my training data needs to be somewhat balanced, articles cannot be selected randomly. I first construct a dictionary of terms related to migration. I use dictionary extension based on German GloVe word-embeddings<sup>5</sup> to construct a comprehensive dictionary, and apply it to the articles. Based on the relative share of migration words in an article, I draw a stratified sample of 300 articles (100 from articles with no migration terms, 100 from the quarter with most migration terms and 100 from the remainder in between) for each newspaper for a total of 1,800 papers. Then, a student assistant<sup>6</sup> hand-coded these articles, assessing whether their main topic is related to migration.

Using this sample, a BERT transformer model<sup>7</sup> is fine-tuned on a subset of 1,400 annotated articles. After fine-tuning, the model correctly classifies 95.5% of the test set (F1: 0.94, recall: 0.93, precision: 0.95). This classifier is then used to annotate all 2.5 million newspaper articles. For the time frame from 2013 to 2019, around 90,000 (3.6%) are identified to treat the issue of migration.

Figure 2 shows the share of migration articles in each newspaper. Clear peaks

<sup>5</sup>Downloadable from <https://deepset.ai/german-word-embeddings>.

<sup>6</sup>Thank you, Robin. I know it was painful.

<sup>7</sup><https://huggingface.co/bert-base-german-cased>

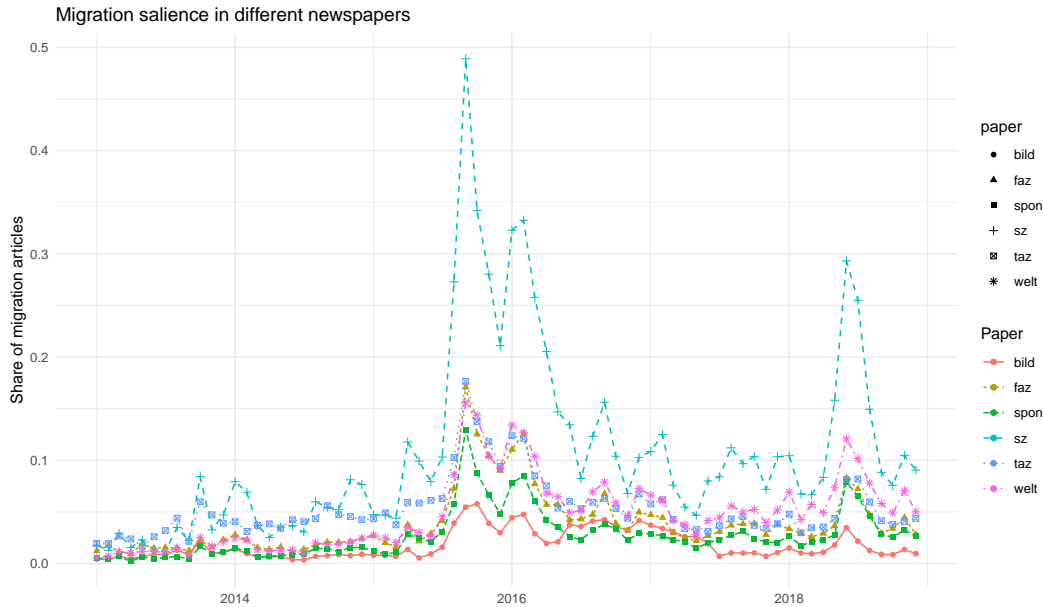


Figure 2: Share of migration content out of all content in six different newspapers.

in attention are visible surrounding the refugee movements of summer 2015, following the new years eve in Cologne 2016, and the conflict over asylum policy between CDU and CSU in 2018. Newspapers seem to be event-driven and follow largely parallel trends, albeit at different levels, with the centre-left *SZ* discussing migration most and the tabloid *Bild* least. Attention decreases in mid-2016, but remains high compared to pre-2015 levels. Surrounding the fielding period of the survey waves (gray vertical lines), most newspapers show similar levels of attention to the issue between 2.5% and 6% of all articles, with the exception of *SZ*, which moves between 5% and 12.5%.

#### 4.2.2 Identifying Considerations in Migration Content

To identify different considerations about migration in news coverage, I estimate a structural topic model with 60 topics for the nearly 90,000 migration articles in the full period (2013-2019)<sup>8</sup>. The number of topics was chosen to strike a balance between the computational and human resources necessary to estimate and annotate the topics and finding appropriate topics for the large corpus of

<sup>8</sup>The topics' prevalence along with the most important words can be assessed in the appendix.

nearly 90,000 migration articles<sup>9</sup>. Topic prevalence is estimated as a function of the release date of the article, as well as the newspaper it has been published in. The 60 topics' most predictive words and ten most representative articles were assessed to identify and label the content of each topic, and all topics related to crime (two in total) are selected and their prevalence added together for a daily measure of attention to crime in each newspaper.

#### 4.2.3 Measuring Dependent and Conditioning Variable

The conditioning and dependent variables are measured using the Election Panel by the German Longitudinal election study. This study consists of a total of 15 waves from 2016-2020, with 10,000 - 20,000 respondents per wave (Debus, Faas, and Roßteutscher 2017). Seven of these waves contain questions on immigration attitudes, asking respondents whether immigration of foreigners should be restricted or made easier. Responses were recorded on a seven-point Likert scale. This variable was centered on zero ( $-3$  - easier,  $3$  - restricted).

The survey also contains a question on newspaper consumption, which was asked in seven waves, of which four overlap with the dependent variable. The question provides respondents with a list of the six major daily newspapers plus an option "another daily newspaper," and asks whether they had consumed the paper in print or read articles from their website, and if so, how many days in the past week.

#### 4.2.4 Measuring the Accessibility of Considerations

The measurement of the accessibility of issue considerations in observational research is difficult, as running panel surveys are usually not asking about specific considerations about issues of the day. However, other measures should be highly correlated with the concept of cognitive accessibility. The attitudes themselves are the clearest manifestation of the accessibility of considerations. As Ajzen and Fishbein (2000: 5) write: "highly accessible beliefs tend to correlate more strongly with an independent measure of attitude than do less accessible beliefs." If a person has an extreme position on an issue, in line with a specific salient consideration, it is more likely that they strongly associate this consideration with the issue than if this person had an opposing opinion.

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<sup>9</sup>Currently, I work to identify crime content using supervised models (similar to the identification of migration content) to provide a specific estimate of the attention to the consideration of interest. I will also analyse the data with embedding regression, assessing how the meaning of migration related terms like 'migrant', 'asylum' or 'syrian' changed in Bild compared to other newspapers

Hence, I will use the initial migration opinion in wave 1 of the panel as measure of the accessibility of crime in the evaluation of immigration policy.

### 4.3 Estimation

I will present evidence from two different estimation strategies to capture the effect of crime framing in migration coverage on immigration attitudes. The first will exploit the case outlined above and a *difference-in-differences* (DiD) estimator to show the effect of the editorial change - and the related content shift - on migration attitudes:

$$y_{it} = \alpha + \beta_1 * Post_t + \beta_2 * BildReader_i + \beta_3 * Post_t * BildReader_i + \epsilon_{it}$$

The dependent variable  $y_{it}$  indicates a respondent's migration attitude in a given survey wave, measured on the Likert scale described above. The conditioning variable  $BildReader_i$  is a simple binary variable indicating whether respondents read *Bild* in the past week and is measured in the pre-treatment wave.  $Post_t$  indicates whether an interview took place preceding or following the editorial change. The estimator of interest is  $\beta_3$ , which indicates the change in migration attitudes of *Bild* readers following the editorial change, controlling for pre-treatment differences ( $BildReader_i$ ), as well as general pre-post shifts in migration attitudes ( $Post_t$ ).

The second strategy combines the media content analysis with the survey data directly to generate a measure of individual exposure to migration content. Based on the responses to the question which newspapers an individual consumed for how many days in the past week, I generate a weighted estimate of migration content in the week preceding that survey date. I do that by first estimating the daily attention in the specific outlet in the week preceding the interview date. Then, I weight it by the days the person read it and divide the sum of the two by the overall number of days a person read any newspaper. This provides me with an individual estimate of migration content in a respondent's news diet, dependent on interview date and the frequency of newspaper consumption:

$$Attention_{i,c} = \frac{\sum_{np=1}^{NP} DaysRead_{i,np} * \frac{\sum_{d=1}^{d-7} Attention_{np,c}}{7}}{\sum_{np=1}^{NP} DaysRead_{i,np}}$$

So if individual  $i$  read paper  $A$  (devoting 10% of their migration coverage in the past week to consideration  $c$ ) for 3 days last week and paper  $B$  (devoting 20% to  $c$ ) 7 days, then the estimated relative exposure to consideration  $c$  would be  $\frac{3*0.1+7*0.2}{7+3} = \frac{1.7}{10} = 0.17$ .

This estimate can then be used to assess whether the individual migration opinion has been affected by changing news coverage using a *two-way fixed-effect model*. This means that general time trends ( $\phi$ ) and individual differences ( $\rho$ ) are controlled for in order to estimate within-individual changes beyond general trends in migration attitudes. This estimation strategy creates a rather high hurdle to detect effects, not only because we have to rely on daily estimates of newspaper content - which can only be a proxy for actual exposure, but also because the data in this model comes from two different sources, mitigating potential common source error ([1]).

$$y_{it} = \alpha + \beta_1 * FrameExposure_{it} + \rho_i + \phi_t + \epsilon_{it}$$

## 5 Results

### 5.1 Treatment

Figure 3 shows the development of crime attention and a difference-in-differences estimate of *Bild* compared to other newspapers in 2016 and 2017. The left panel shows the average monthly attention to crime topics within migration content for *Bild* (red line) and all other newspapers. All newspapers start at a very high level in January 2016, when the aforementioned new years eve is discussed and develop at somewhat similar levels across 2016. When Reichelt takes over as chief editor in February 2017, the share of crime content out of all migration coverage is around 3% and *below* that of other newspapers. This starkly changes around four months later, in June 2017, when both papers experience a peak and *Bild* moves up to a plateau around 10%, compared to around 5% in all other newspapers. Comparing the changes pre-post with a difference-in-differences estimate for each newspaper (right panel), it becomes evident that *Bild* was the only newspaper that experienced a substantial shift in the attention devoted to migration content addressing crime, with an increase of around five percentage points compared to all other newspapers.



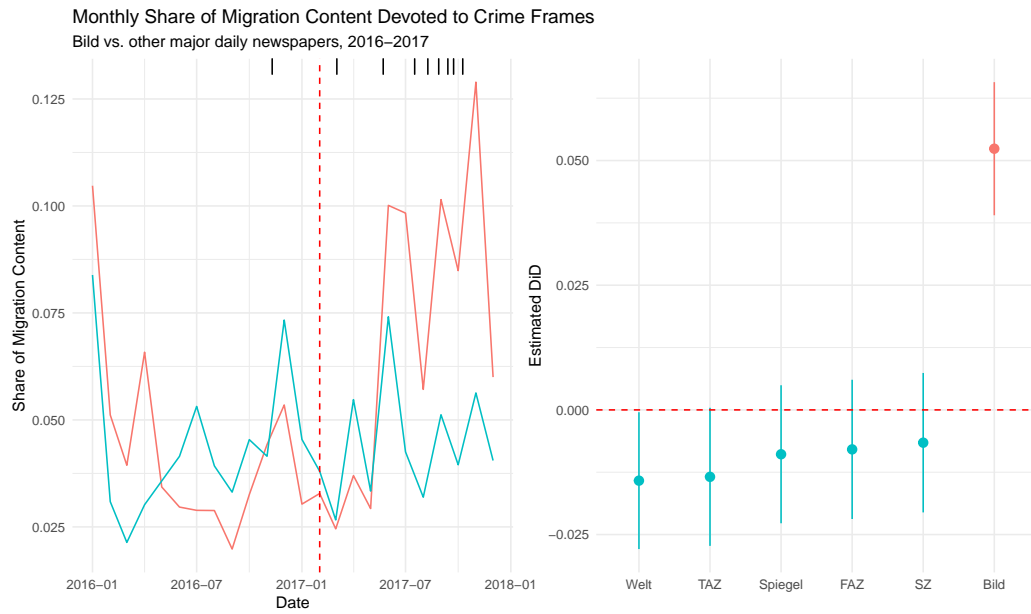
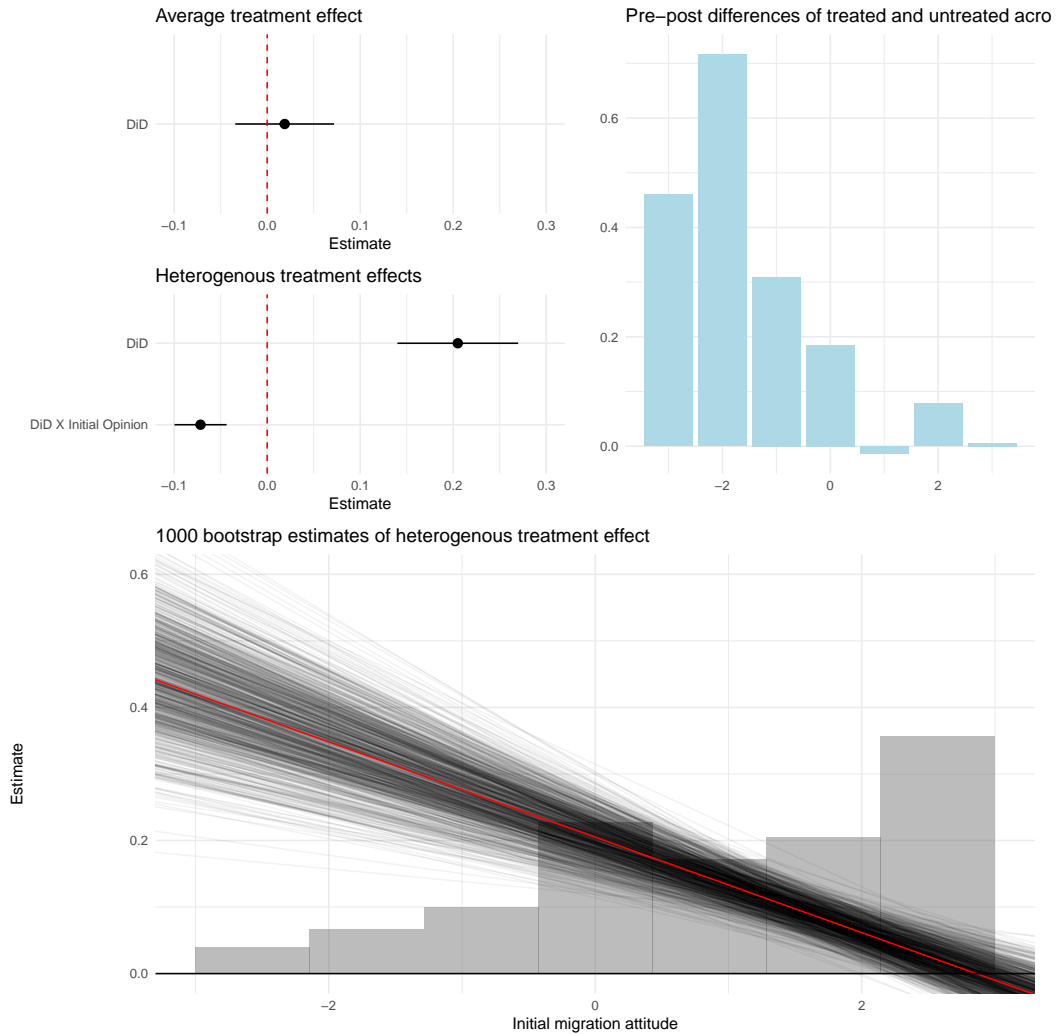


Figure 3: Estimated change in attention to crime content in migration coverage, Bild vs. other newspapers.

## 5.2 Effects

### 5.2.1 DiD



How did this shift in migration content affect migration attitudes? The first plot in the upper left panel of figure ?? shows the average treatment effect of the simple DiD model. We can see a small, positive, but insignificant effect of around 0.02 points on the seven-point Likert scale.

Others arrived at similar findings. For example, Guess et al. (2021, 4) interpret the effective null in the average treatment effect as “results that in many ways provide support for a minimalist view of media impact.” However, as I will

show, it is important to take into account how the accessibility of considerations structures the processing of new information.

The second panel in the top left corner of figure ?? presents the DiD-estimate conditional on respondents' migration attitude in the first wave. As I centered this variable, the direct effect indicates the change among *Bild*-readers with moderate migration attitudes. We can see a fairly robust effect of 0.2 points on the seven-point scale (around 3% of the scale). This might seem small, but keep in mind that the treatment was a mere increase in crime coverage on migration of around 5 percentage points. The interaction effect indicates that, with higher values of the initial migration attitude (i.e. more restrictive), this effect decreases to -0.01, a negligible substantive effect statistically not significant from zero. Vice versa, however, the effect increases for those with the most liberal attitudes up to 0.42 points on the seven-point scale (6%).

The bottom panel visualizes this better, together with 1000 blocked bootstrap estimates, resampling individuals rather than observations (Bertrand, Duflo, and Mullainathan 2004). Both the simple linear model estimate and the bootstrap suggest highly significant estimates. The histogram in the background of the bottom visualisation also suggests why the average treatment effect is insignificant: many respondents hold a restrictive attitude on migration and thus do not react to the new information. The upper right panel shows the treatment effects for each pre-treatment attitude, essentially matching respondents. The estimated difference among those with liberal migration attitudes with this approach reaches up to 0.72 points, or 10.3% of the overall scale - given a 5 percentage point increase in attention to crime in migration coverage. The linearity assumption of the interaction effect seems justified, as effect estimates become smaller moving from the most liberal to the most conservative issue attitude.

### 5.2.2 Individual Exposure Model

In order to assess the robustness of these estimates, as well as their generalizability beyond *Bild*-readers, I estimate an individual exposure model with two-way fixed effects. Figure 4 displays the result. Note that a one-point increase in the independent variable denotes a 100 percentage point increase in the share of crime content in migration coverage.

The overall pattern is similar to the results reported for the DiD-model, suggesting a generalization of the heterogeneous impact of crime news on migration attitudes. The direct effect suggests an impact of 0.5 points for a one hundred

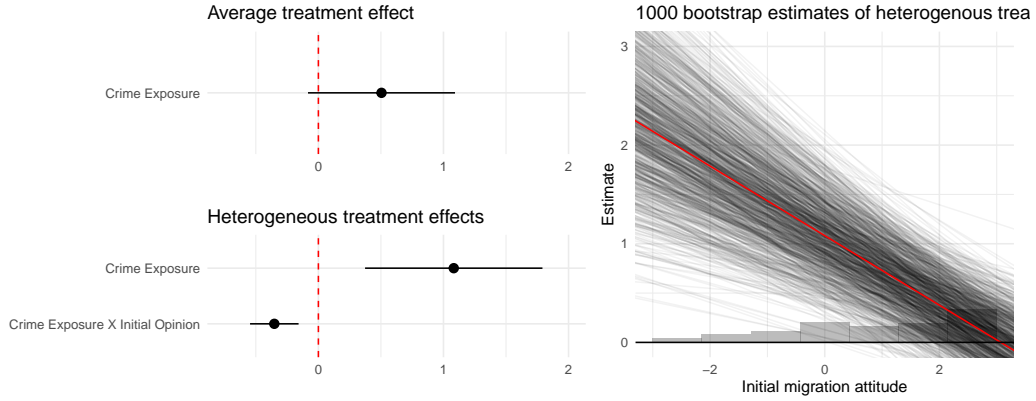


Figure 4: Average and heterogeneous treatment estimates from individual exposure model

percentage point increase in attention to crime in migration coverage. For a treatment similar to the change in the migration coverage in *Bild* (a 5 percentage point increase), this suggests a small effect of 0.025 points, which is not significant.

However, the picture changes again when exposure is interacted with different levels of pre-treatment attitudes. For respondents with the most liberal migration attitudes, the model predicts that a 100 percentage point increase in crime framing corresponds to a 2.14 point change on the seven point Likert scale, or 0.11 points with a five percentage point treatment. These estimates are far smaller than in the DiD-model (by a factor of three to four). This is likely an outcome of the higher hurdles this model faces in terms of the combination of media content and survey responses, introducing more noise and thus decreasing effect size ([1]). Although with less precision, the estimates are significant both in the OLS model and with the blocked bootstraps (see also bottom figure 4).

### 5.3 Timing of effect

If, as claimed, the change in migration content is responsible for the opinion change, then the shift in migration attitudes should correspond to changes in migration coverage. Figure 5 plots the difference of readers and non-readers of *Bild* across waves, as well as the changing content in *Bild* at the same time. As we can see, while all reader attitudes remain rather stable following the change in editorship, attitudes among liberal and neutral readers become more

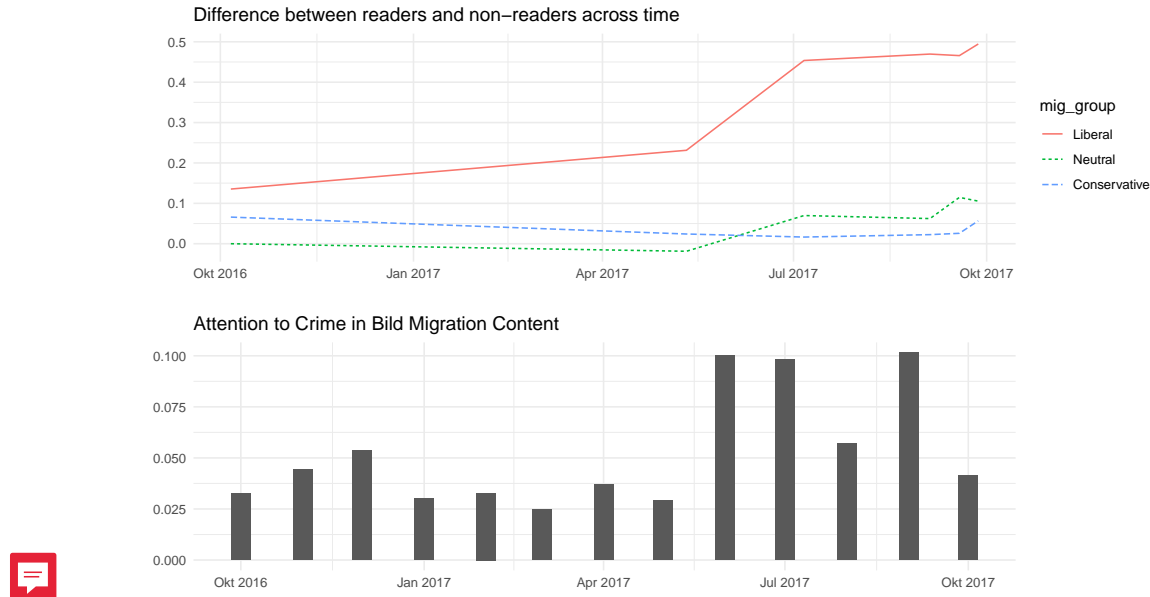


Figure 5: Differences between treated and untreated across time and corresponding migration content

conservative once the attention to crime in *Bild*'s migration coverage increases. This is strong evidence that the content of the tabloid was the driving factor behind the attitudinal changes.

## 5.4 Selecting out

Another expectation in the literature is that readers selectively choose their outlets based on the alignment of the content with their political attitudes (Bennett and Iyengar 2008). Figure 6 gives some indication whether this is the case. As there is no pre-treatment wave, no DiD-estimates regarding the likelihood of individual readers to stop consuming the newspaper<sup>10</sup>. The evidence presented is therefore purely descriptive. The graph shows the association of migration attitudes in the first wave with the likelihood to read *Bild* in later waves for all respondents who claimed to read the paper at a later point. As can be seen, those with liberal migration attitudes are actually slightly *more* likely to continue reading the newspaper. This is the opposite of what

<sup>10</sup>Two pre-treatment waves would be necessary at least: one in which the readership is defined and one giving a pre-treatment estimate of the likelihood of outward selection, based on the readership definition in the first wave.

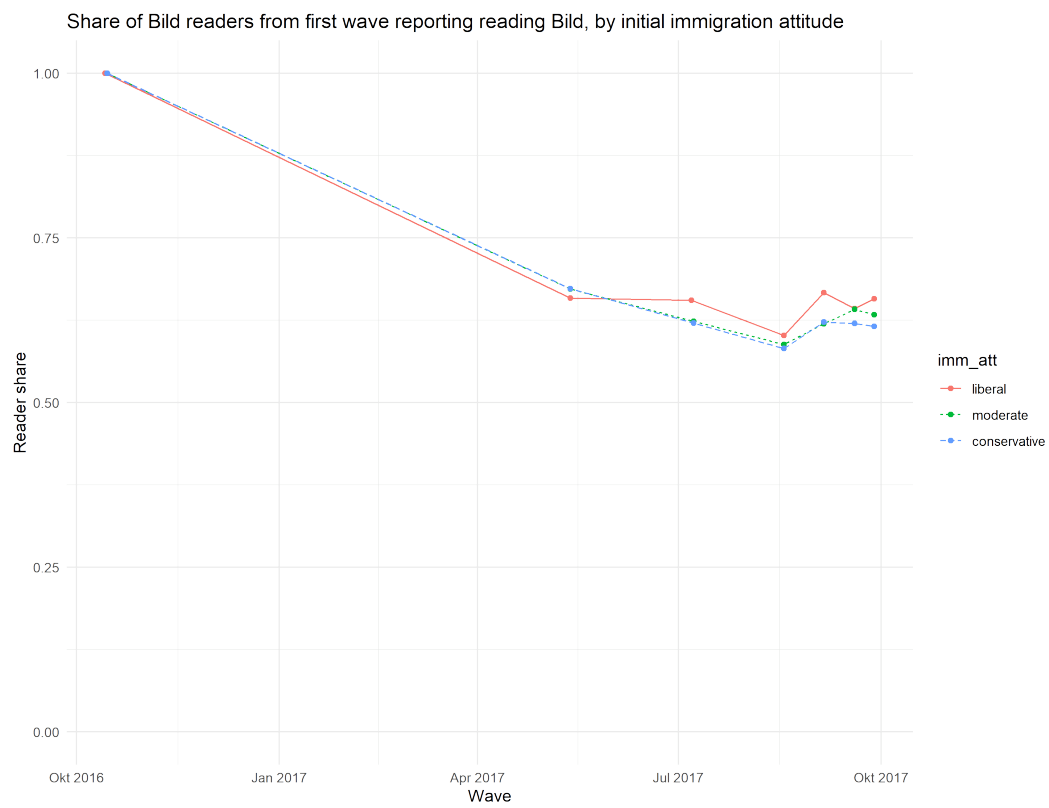


Figure 6: Opt-out of conservative readers across time, pre-and post treatment

would be expected, given that the newspapers' migration coverage became more conservative. Figure 7 shows the association of migration attitudes and *Bild* readership across time. Generally, conservative migration attitudes are positively associated with readership of the tabloid. However, following the change in editorship, this relationship weakened. Again, this is in direct contradiction of what would be expected by the selective exposure literature: if consumers sought news content in line with their preferences, the relationship should strengthen after the newspapers' conservative turn.

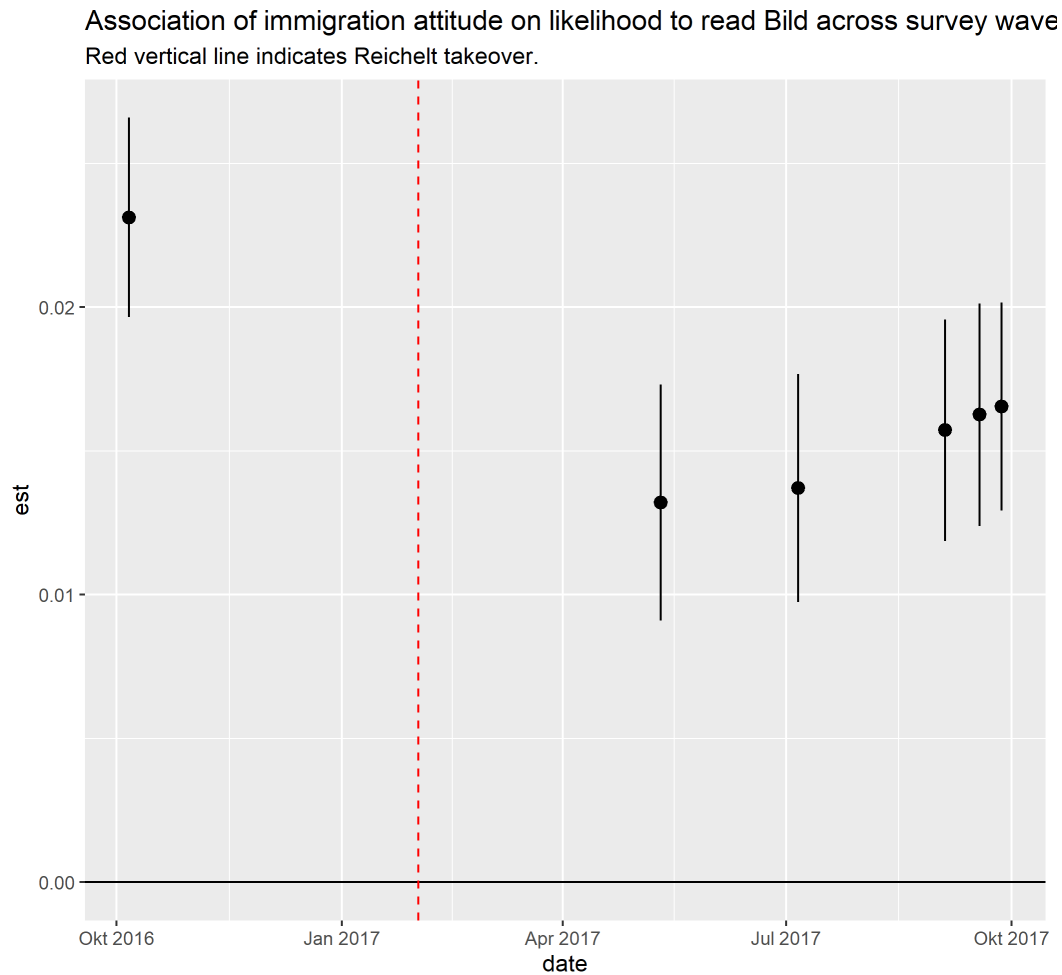


Figure 7: Association of migration attitude with Bild-readership across time



## 6 Conclusion



The results underline the substantial importance of the news media for opinion formation. By associating the valenced topic of crime with the migration issue, *Bild* could substantially reshape the migration attitudes of their readers. The findings of the individual exposure model suggest that this phenomenon is not limited to tabloid readers but a strategy that could be employed by any news outlet. Given the least-likelihood nature of the issue and the case, the impact of news content on issue attitudes should be even more pronounced for less affective and polarised issues in less politicised contexts. Furthermore, the results support the implications of the value-expectancy model of opinion formation. By being exposed to crime content in the discussion of migration and migrants, citizens learn a new issue definition and as a result change their reported migration attitude.

However, this process does not affect all citizens similarly. Those respondents who are most likely to already hold perceptions of migrants as criminals do not respond to increases in crime framing. This is in line with the interpretation that citizens react only to new information by updating their issue definitions, while those who already formed an association of migration and crime will not react. This does by no means suggest that conservatives will never react to conservative frames. New considerations might well make conservative respondents on an issue even more conservative (and vice versa for liberals). However, it is important to assess how accessible considerations condition the effects of new information. This is a promising avenue for further research.

The findings have a clear implication for the media effects literature. The current practice of focusing on the average treatment effects of exposure to entire news outlets will only be fruitful if scope conditions like accessibility of considerations and the precise nature of the treatment are considered. Otherwise even the most elaborate field experiments will result in conflicting findings.

Interesting insights can be won for political strategy as well. By associating issues with other concepts with clearly valenced evaluations (such as crime, freedom, or democracy), political actors can manipulate mass opinion on these issues. An interesting question for political competition is whether this is also possible for political actors - can political parties' images become more positive or negative dependent on accessible associations?

Fundamentally, these results suggest that the news media can have substantial impact on public opinion, albeit in a more nuanced way than previously shown. They underline the critical role that the news media plays in the making of



public opinion in contemporary democracies by defining what is at stake for citizens.

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