

## Intermedia Agenda Setting in a Policy Reform Debate

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This study investigates intermedia agenda-setting dynamics between traditional news media and social media in a policy reform debate. Whereas the role of traditional news media in public debates is generally acknowledged, the growth of social media raises questions about its potential power to set the agenda. This study contributes to the intermedia agenda-setting literature by extending the theory to the social media context, aiming to unravel causal relationships between traditional and social media. We use an automated content analysis to examine traditional and social media coverage between 2009 and 2016 of the Dutch policy reform to raise the retirement age. Results of pooled fixed effects time series models show support for a mutual influence between the traditional and social media agendas. By looking at the effects per subissue, monthly level vector autoregression models provide more empirical support for the influence of traditional news media on social media than for the reverse.

*Keywords: intermedia agenda setting, automated content analysis, time series analysis, traditional news media, social media, policy reform*

Increases in life expectancy are challenging the long-term financial sustainability of retirement systems in many societies. To address this challenge, several governments—for instance, in Germany, the United Kingdom, Italy, France, and the Netherlands—are implementing pension reforms and are raising the retirement age. In the Netherlands, for example, the age to receive a basic state pension (*Algemene Ouderdomswet*) is set to increase stepwise from 65 to 67 years in 2021. From 2022 onward, the retirement age will be linked to life expectancy estimates.

Such policy reforms are contested in society due to their high impact on citizens (Grünell & Houtman, 2011; Van Erp & De Hek, 2009), and they are often the subject of heated public debates (Kroon,

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Date submitted: 2018–11–25

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Van Selm, Ter Hoeven, & Vliegenthart, 2017; Van Erp & De Hek, 2009). Scholars have argued that the media serve as a central arena in which those public debates take place (Roggeband & Vliegenthart, 2007; Wolfsfeld, 2001)—an idea that draws attention to the media's role in constituting a space where ideas and opinions about the retirement age issue are articulated. Today's media arena consists of many communication environments, most notably due to the rise of social media (McCombs, 2014). This development introduces an important question about the potential role of social media in public debates: Do social media have the power to set the agenda in public debates, or do traditional news media still steer the agenda? While research in the field of social welfare has signaled and speculated on the central role of the media in the debate on pensions (e.g., May, 2013) and retirement age (e.g., Vyncke & Van Gorp, 2017), previous studies have largely neglected the different communication environments in which policy reforms are discussed, and relatively little is known about intermedia agenda setting between traditional news media and social media, with only a few studies addressing this relationship.

The aim of this study is therefore to investigate intermedia agenda-setting dynamics between the traditional news media agenda and the social media agenda, focusing on coverage of the Dutch policy reform to raise the retirement age. Both the Netherlands and the policy debate form an excellent case to study these dynamics. In the Netherlands, a heated public debate about raising the retirement age has been ongoing since 2009 (Vermeer, Mastrogiacomo, & Van Soest, 2016). In this sense, the Netherlands resembles other (European) countries where the reform measure has been contested (Van Solinge & Henkens, 2017). Given the controversy and high impact of this policy reform, it is widely covered in traditional news media and on social media, making it a compelling case to study intermedia agenda-setting dynamics.

By employing an automated content analysis of media coverage in the period 2009–2016, we first explore the most discussed subissues within this policy reform debate. Then we compare the intermedia agenda-setting patterns of traditional news media and social media coverage across these subissues. By examining a relatively long time period and applying advanced time series techniques, we are able to effectively test the intermedia agenda-setting effects of traditional news media and social media. This study contributes to previous research—which is scarce—by delving more deeply into issues to discover how intermedia agenda setting works at the level of subissues.

### **News Media as an Arena**

From a functional perspective, news media can—among other things—be described as an arena (Roggeband & Vliegenthart, 2007; Snow, Soule, & Kriesi, 2008; Van Aelst & Walgrave, 2016). Drawing from Habermas' idea of the public sphere—which can be constituted through various institutions—the media arena is a more focused concept in which the media constitute a space where people can express and hear ideas, and where debates on social issues take place (Puddephatt, 2006; Roggeband & Vliegenthart, 2007). In this sense, the news media can be referred to as a unique arena where issues are defined and interpreted (Roggeband & Vliegenthart, 2007).

In today's media landscape, several different media types can be considered subarenas (Coombs & Holladay, 2014; Vos, 2017). This study focuses on traditional news media and social media as two dominant ones. The prevailing way to learn about most issues and policies is through traditional news

media (Van Aelst & Walgrave, 2016). In the news production process, traditional news media and professional journalists decide which items or perspectives are newsworthy in a process (partly) ruled by media routines and news values (Cook, 2006; Van Aelst & Walgrave, 2016). Traditional news media have a significant role in determining the saliency of issues along with defining and interpreting these issues (Van Aelst & Walgrave, 2016). Additionally, social media contribute to the media arena. In today's media context, individuals' opinions and thoughts are ventilated through many social media platforms (Harder, Sevenans, & Van Aelst, 2017; McCombs, 2014). In essence, everyone is able to produce and share his or her content via, for instance, Twitter or Facebook. Hence, social media enable a wider range of people to get involved in societal debates (Hellsten & Vasileiadou, 2015) with no institutional constraints.

### **Intermedia Agenda Setting**

Traditionally, agenda-setting theory concerns the transfer of issue salience from the media to the public (McCombs & Shaw, 1972). Central to the theory of agenda setting is the idea that the prominence of issues in news media influences the prominence of these issues among the public (Carroll & McCombs, 2003; Scheufele & Tewksbury, 2007). The agenda-setting hypothesis gained much attention in the field of communication research; hence, a wealth of evidence for the influence of the media agenda on the public agenda has accumulated over the years (Dearing & Rogers, 1996; Lopez-Escobar, Llamas, & McCombs, 1998).

With agenda setting as a starting point, some researchers have shifted their focus to understand how, in turn, the media agenda is shaped. By extending the original focus of agenda setting, they developed the notion of intermedia agenda setting, which focuses on how the content of one medium influences the content of other media outlets (Harder et al., 2017; Lopez-Escobar et al., 1998; Sweetser, Golan, & Wanta, 2008). In the same way as media determine the prominence of certain issues in the minds of the public, media can also influence what other media consider to be salient issues. Hence, the concept of intermedia agenda setting focuses on the influence of issue salience within the media arena. Previous studies have proven that the agenda of one medium follows the agenda of another medium. Some studies have examined the reciprocal influence of the same type of media—for example, newspapers (e.g., Breen, 1997)—while others have examined the agenda-setting effects among different media types—for example, the mutual influence of newspapers and television (e.g., Protess & McCombs, 1991; Reese & Danielian, 1989; Vliegenthart & Walgrave, 2008).

The rise of the Internet and social media has opened up a wide range of new media platforms, such as Facebook, Twitter, and blogs. These interactive platforms are widely used in society and enable people to initiate or participate in discussions relatively easily (Neuman, Guggenheim, Jang, & Bae, 2014; Zhang & Skoric, 2018). Hence, the audience is, in addition to consuming information, now also able to produce its own content. Accordingly, journalists in traditional news media are no longer the only ones who provide news (Harder et al., 2017; Jang & Park, 2017)—a development that provides a new perspective for studying intermedia agenda setting (Kim, Gonzenbach, Vargo, & Kim, 2016). So far, however, there is still limited knowledge about the intermedia agenda-setting dynamics between traditional news media and social media, with only a few studies addressing this relationship. For example, Meraz (2011) has investigated intermedia agenda setting between traditional media and online political blogs and concludes that blogs are able to

exert a moderate influence on traditional media's agenda. In line with this, Hellsten and Vasileiadou (2015) find that, in the Climategate debate, blogs increased newspapers' attention for this topic. In contrast, the findings of Rogstad (2016) reveal that social media are following traditional media's content more than the other way around. Kruike-meier, Gattermann, and Vliegenthart (2018) find—in a recent study on politicians' visibility—a reciprocal influence between traditional news media and social media, although the size of this influence varies across politicians. A study by Jang and Park (2017) finds an influence of Twitter on news media coverage in the overall attention devoted to an issue (a ferry tragedy), while news media influenced Twitter regarding the target of blame in this disaster. The findings of a study by Kim et al. (2016) provide evidence for an influence of first- and second-level intermedia agenda setting among political advertisements, newspapers, and tweets for two presidential candidates.

### **Who Sets the Agenda in the Media Arena?**

This study builds on previous research by examining the extent to which intermedia agenda-setting effects exist between traditional news media and social media, aiming to determine who sets the agenda at the specific level of subissues.

On the one hand, it can be argued that the direction of influence is from traditional news media to social media (Neuman et al., 2014). Traditional news media are an important source of information. People learn about the latest updates, developments, and events primarily by following traditional news media (Zhou & Moy, 2007), and they will perceive the information provided by the news media as important (Searles & Smith, 2016). In addition to being a frequently used source, traditional news media are perceived as a credible and objective source (Kroon & Van der Meer, 2018). Due to their professional character and resources, traditional news media are seen as a reliable source (Kruike-meier et al., 2018). Following this reasoning, we argue that the prominence of a subissue on the traditional news media agenda influences the prominence of the subissue on the social media agenda.

On the other hand, the question of whether social media content influences the agenda of traditional news media has been largely neglected. Yet the Internet and especially social media provide an environment where people can communicate about important issues on their minds (Castells, 2007). Online discussions can add meaning and news value to a certain issue, which, in turn, can influence the issue prominence in traditional news media (Zhou & Moy, 2007). Moreover, the production process of traditional news media has changed since the rise of social media. Today, many journalists use social media as an important source of information (Jang & Park, 2017; Lecheler & Kruike-meier, 2016). As a result of a deteriorating financial situation among traditional news media, social media are becoming even more important as a source (Parmelee, 2014). We expect that the subissues communicated on social media serve as input for the traditional news media agenda. Hence, we expect a reciprocal influence between traditional news media and social media. We formulate general hypotheses to test these intermedia agenda-setting effects rather than formulating separate hypotheses for each specific subissue. We elaborate on the specific subissues in the Discussion section and speculate on the role of subissue attributes in intermedia agenda-setting dynamics.

*H1a: An increase in attention for a certain subissue in traditional news media leads to an increase in attention for the subissue on social media.*

*H1b: An increase in attention for a certain subissue on social media leads to an increase in attention for the subissue in traditional news media.*

### **The Case of Raising the Retirement Age in the Netherlands**

In the historical context of the Netherlands, the issue of the retirement age has been salient for many years (Van Selm & Van der Heijden, 2013). Since 2009, attention to this issue has intensified in light of the policy reform to (gradually) raise the age to receive a basic state pension from 65 to 67 years in 2021.<sup>1</sup> Further increases in the retirement age will depend on life expectancy estimates and economic factors in the years to come. These changes are captured in a bill that was first introduced in 2009 and officially adopted by the Dutch government in 2012.

Since it was first announced in 2009, the policy reform of raising the retirement age has evoked much criticism and a fierce societal debate in the Netherlands (Vermeer et al., 2016). In this sense, the Netherlands forms an exemplary case because it resembles many other European countries where similar reform measures have been contested. For example, in France, Italy, and the United Kingdom, the increase in the retirement age has led to many reactions and protests (Van Solinge & Henkens, 2017). The case of the Netherlands is particularly interesting because the reform measure was implemented in a relatively short period and faster than initially communicated (Van Solinge & Henkens, 2017), and this may have intensified the policy debate under investigation.

#### **Method**

##### **Data**

We collected longitudinal data on traditional news media and social media coverage of the retirement age issue, published between 2009 and 2016. The rationale for examining this time period is to capture different phases of the media debate: the introduction (in 2009), adoption (in 2012), and aftermath of the bill. In addition, we collected a set of organizational communication outlets and included organizational media as a control variable, because it potentially influences the relation between traditional news media and social media (further explained below).

##### **Traditional News Media**

For traditional news media, this study relied on newspaper articles. Using national newspapers has three important advantages over other types of traditional news media: (1) Compared with other countries, newspaper readership is relatively high in the Netherlands (P. Bakker, 2013; Boumans, Trilling, Vliegthart, &

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<sup>1</sup> The pension system in the Netherlands consists of three pillars: (1) basic state pension (*Algemene Ouderdomswet*), (2) collective occupational pension schemes, and (3) individual pension schemes. The basic state pension (the first pillar) is organized as a pay-as-you-go system, in which the current working population pays for the pensioners. It is ideally supplemented with benefits from personal pension plans (the second and third pillars), which are organized as investment systems.

Boomgaarden, 2018); (2) newspapers are considered important agenda setters (De Feijter, 2007; Palmgreen & Clarke, 1977); and (3) newspaper articles are written texts and easy to retrieve, which is a major advantage for automated content analysis (Van der Meer, 2016). In addition to these advantages, newspapers and television are fairly similar in the content of their news coverage in the Netherlands; hence, newspapers can be considered as a proxy for traditional news media (Kleinnijenhuis, 2003). We selected five subscription-based Dutch national newspapers with the highest circulation rates, because these newspapers reach a large proportion of Dutch citizens. This selection included popular newspapers *Algemeen Dagblad* and *De Telegraaf* and quality newspapers *De Volkskrant*, *NRC Handelsblad*, and *Trouw*.

Newspaper articles were obtained through LexisNexis using a broad and extensive search string that was refined by trial and error. The reasoning behind this search string—which includes broad terms for the words *pension*, *age*, and *raise*—was to maximize the inclusion of relevant articles (i.e., articles that deal with the topic of raising the retirement age) while avoiding irrelevant ones and without further specifying the content of the articles. This procedure resulted in 5,002 newspaper articles: 665 from *Algemeen Dagblad*, 937 from *De Telegraaf*, 1,368 from *De Volkskrant*, 1,058 from *NRC Handelsblad*, and 974 from *Trouw*. A manual check of a subset of the sample confirmed that the articles indeed deal with the retirement age issue.

### **Social Media**

We included social media messages—both posts and comments—from various platforms, aiming to get a general impression of the different social media types that exist in the media landscape. We selected Twitter, Facebook, blogs, and forums, because these platforms differ in their use and functions (i.e., what the platform has to offer). Twitter is a microblogging site typically used to share news, opinions, or what is currently happening, while Facebook is a social networking site, mostly used to build or maintain social relationships and stay up to date about peoples' lives and activities (T. Bakker & P. Bakker, 2011; Smith, Fischer, & Yongjian, 2012). Blogs capture current affairs and events rather than interpersonal matters and tend to offer posts with a deep analysis or a (strong) opinion (Jang & Park, 2017; Kenix, 2009). Finally, forums are online communities that bring people together for more elaborate interaction and conversation on various topics (Weinberg & Pehlivan, 2011).

Social media messages were obtained through Coosto with the same search string that was used to collect newspaper articles.<sup>2</sup> This process resulted in a sample of 77,908 social media messages: 42,096 from Twitter, 1,533 from Facebook, 26,263 from blogs (e.g., *50-plusser*, *Das Kapital*, *De Dagelijkse Standaard*, *Effectory*, *InfoNu*) and 8,016 from forums (e.g., *DeBeurs*, *Fok! Forum*, *Gathering of Tweakers*, *Iex*, and *Vara Kassa forum*).

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<sup>2</sup> Due to Coosto's daily indexing of websites and social pages, the number of messages that appear in Coosto fluctuates constantly. For example, messages removed from social media are also removed from Coosto. To prevent these fluctuations from affecting the sample, we downloaded all the social media data on the same day (October 20, 2017). Unfortunately, for Facebook, we could only collect posts and comments from 2016.

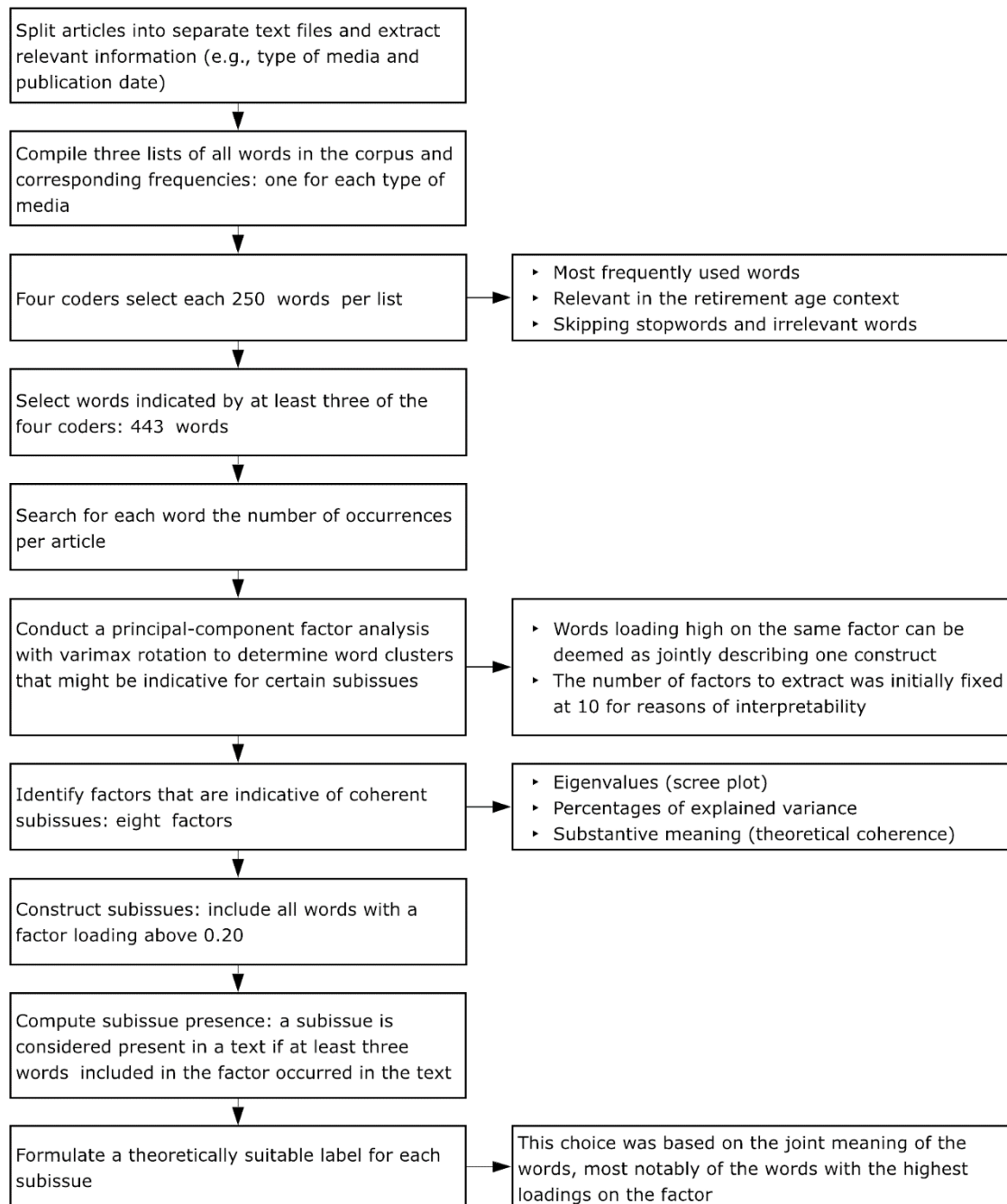
***Control Variable: Organizational Media***

Because organizations are an important source for journalists—most notably organizations' information subsidies such as press releases—we included organizational media as a control variable. Earlier studies have found that organizations are often successful in subsidizing the media with material (Boumans, 2017; Erjavec, 2005). The role of organizations as sources of information might be even more significant in the context of raising the retirement age because they constitute the places where the reform measure will be implemented. Since organizations are likely important actors in the debate on raising the retirement age, it is important to control for their potential influence on both traditional news media and social media coverage. In addition, by including organizational media as a control variable, we aim to take a (small) step toward addressing the widely acknowledged problem of omitted variable bias in (intermedia) agenda-setting research. This bias occurs when relevant variables that might influence the independent and dependent variable are excluded from analyses.

We collected two types of communication tools—press releases and annual reports—from 14 organizations that were selected based on several criteria (e.g., being a large employer in the Netherlands, representing different sectors, and availability of press releases and annual reports). These 14 organizations together published 7,342 press releases and 108 annual reports throughout the period under study; they were all searched with the same search string that was used for traditional news media and social media. This procedure resulted in 17 press releases and 64 (parts of) annual reports dealing with the retirement age issue, together constituting a (relatively small) sample of 81 organizational media materials.

***Instrument***

After collecting the data, we employed an automated content analysis by conducting a co-word occurrence analysis of newspaper articles, social media messages, press releases, and annual reports. We followed the approach of McLaren, Boomgaarden, and Vliegenthart (2017). The steps taken in the analysis are presented in Figure 1.



**Figure 1. Steps of co-word occurrence analysis.**

*Note: For the news media, the selection of words was based on a slightly longer period of time, including 2007 and 2008 as well. The selection of words differs little if we exclude those years.*



### ***Pooled Fixed Effects Time Series Models***

To test the general mutual effects of traditional news media and social media, we started with estimating pooled fixed effects time series models. With these models, we considered the effects for all subissues together instead of singling out the effects for each specific subissue. Put differently, we pooled data from all subissues, enabling us to test the hypotheses in a more robust way (see, e.g., Walgrave, Boydston, Vliegthart, & Hardy, 2017).

Since we expected a reciprocal influence between the traditional news media agenda and the social media agenda, we estimated two models: one with social media and one with traditional news media as dependent variable. First, we needed to determine whether the dependent series were stationary (Hollanders & Vliegthart, 2008). Pooled Dickey-Fuller tests (Fisher-type unit-root tests) yielded significant outcomes for the series of traditional news media and social media, which indicated that the null hypothesis of nonstationarity can be rejected ( $Z = -11.43, p < .001$ ;  $Z = -9.35, p < .001$ ). Second, we investigated the issue of autocorrelation (i.e., correlation between the current value and the previous value of an observation). Wooldridge tests suggested that the null hypothesis of no first-order autocorrelation can be rejected for the series of traditional news media and social media,  $F(1, 7) = 5218.67, p < .001$ ;  $F(1, 7) = 257.70, p < .001$ . We also tested the autocorrelation for each subissue separately: Portmanteau ( $Q$ ) statistics indicated that the series of traditional news media and social media yielded no white noise for any of the subissues. Therefore, we included a lagged dependent variable to account for autocorrelation.

Next, two pooled models were estimated. In these models, all interissue variation is removed by adding dummy variables for each subissue minus one. The first model estimated the effect of traditional news media on social media (H1a), and the second model assessed the effect of social media on traditional news media (H1b). The first model contained lagged values of social media and lagged three-month averages of traditional news media to predict current values of social media; the second model contained lagged values of traditional news media and lagged three-month averages of social media to predict current values of traditional news media.<sup>3</sup> Both models also included lagged differenced values of organizational media as a control variable. We used differenced values because we expect organizational media to have an influence only when major changes occur in the coverage of organizations. We excluded the pension funds subissue from the analyses, because it was rarely present in traditional news media and on social media (further discussed below).

After estimating these models, we investigated the presence of contemporaneous correlation and group-level heteroscedasticity. Contemporaneous correlation means that correlation exists among residuals at the same point in time. Group-level heteroscedasticity implies that the independent variable explains some units less well or better than others. Put differently, the size of the error terms differs across different units. Both models demonstrated the presence of substantial amounts of contemporaneous correlation,  $\chi^2(21) = 1,435.07$ , average  $r = .859$ ;  $\chi^2(21) = 1,609.51$ , average  $r = .911$ , and group-level heteroscedasticity,  $\chi^2(7) = 84.00, p < .001$ ;  $\chi^2(7) = 123.04, p < .001$ . Therefore, we estimated the models once again, this time using ordinary least squares regression with panel corrected standard errors, because such models take into account the issues

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<sup>3</sup> We used lagged three-month averages because we are especially interested in gradual changes in the debate and influence in the long term.

of contemporaneous correlation and group-level heteroscedasticity. These models yielded similar results; thus, we can (more) safely adhere to the fixed effects models and their results.

### ***Vector Autoregression Time Series Models***

Vector autoregression models were estimated to test the reciprocal influence between traditional news media and social media for each subissue separately. This gives us an idea of which subissues are steering the potential effects.

Once again, we first determined whether all series were stationary. Augmented Dickey-Fuller tests yielded significant outcomes in all instances, indicating that the null hypothesis of nonstationarity can be rejected. Based on fit statistics, we determined the best-fitted lag length per model with the maximum number of lags restricted to three (i.e., three months; presented in Table 3). Next, we estimated seven vector autoregression models—one model for each subissue (except for the pension funds subissue). These models included the series of traditional news media and social media as endogenous variables and the series of organizational media as an exogenous variable.

After estimating these models, additional tests were performed to investigate the presence of autocorrelation and contemporaneous correlation. Ljung-Box Portmanteau ( $Q$ ) tests for autocorrelation in the residuals resulted in rejection of the null hypothesis of white noise for three models (i.e., there is no autocorrelation). One way to solve the issue of autocorrelation is to add extra lags (Vliegenthart, 2014). However, for reasons of parsimony, we decided to leave the models as they are and accept that some autocorrelation remains in the residuals. Additional tests indicated a strong contemporaneous correlation among residuals, with an average score of 0.86. This could be an indication that traditional news media and social media were affected by external factors, resulting in similar changes at the same time (Vliegenthart, 2014). It could also be a sign that intermedia agenda-setting effects take place in shorter time intervals than the monthly level considered here; hence, a lower aggregation level might be desirable (Vliegenthart, 2014). However, disaggregating the data is, in our case, problematic because too few news items are published, for example, on a weekly basis, resulting in yet different statistical hurdles.

To examine and interpret possible intermedia agenda-setting effects, we conducted Granger causality tests to establish a causal relationship (Vliegenthart, 2014). If there appeared to be an effect, then the cumulative impulse response function and forecast error variance decomposition were consulted. These tests provide information about the direction (positive or negative), size, and strength of the effect (Vliegenthart & Montes, 2014).

## **Results**

### ***Presence and Over-Time Dynamics of Subissues***

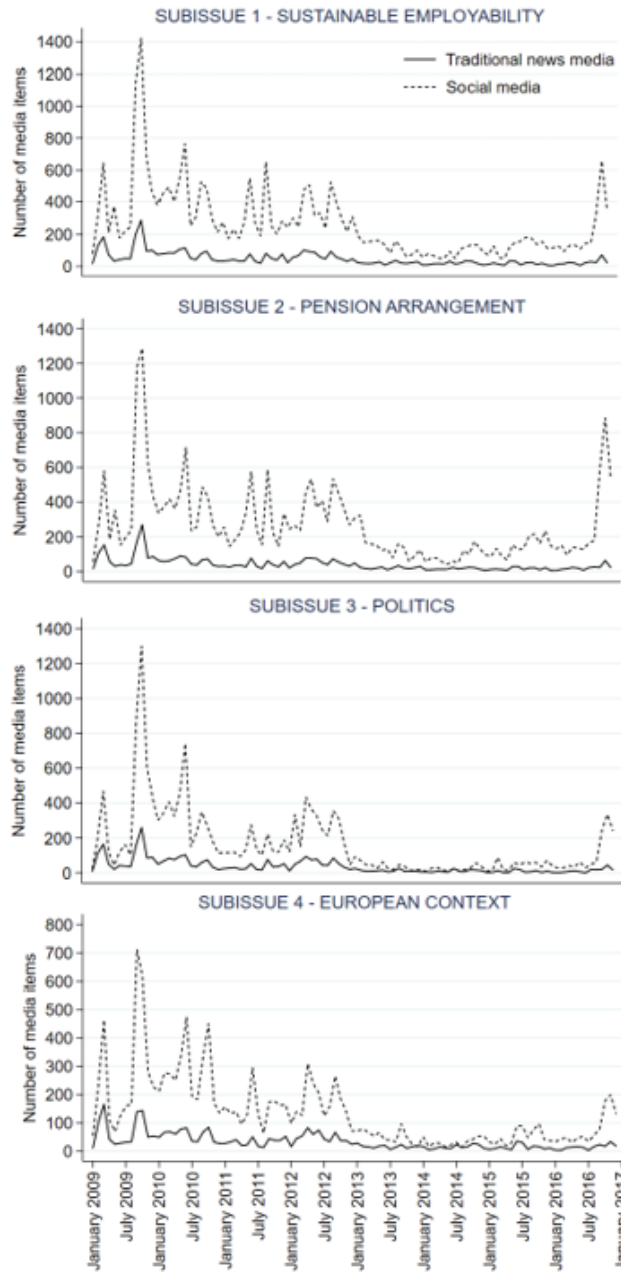
From the co-word occurrence analysis, we identified eight prominent subissues: sustainable employability, pension arrangement, politics, European context, financial risks, purchasing power, labor relations, and pension funds. In general, the subissues were more salient in traditional news media than on social media. Interestingly,

a comparison of both types of media reveals similarities and differences in the degree of subissues' presence (see Table 1). In traditional news media, the labor relations subissue is most frequently discussed. This subissue deals with the negotiations and agreements between the labor unions (representing their members) and the government. Second, sustainable employability is also prominently discussed in the newspapers. In many newspaper articles about the increasing retirement age, journalists focused on labor market participation and how to keep (older) employees vital and capable of working. On social media, the subissue that was discussed most is pension arrangement. In many messages related to the retirement age increase, actors discussed the practical and technical arrangements of the retirement system. The sustainable employability subissue is also widely discussed on social media.

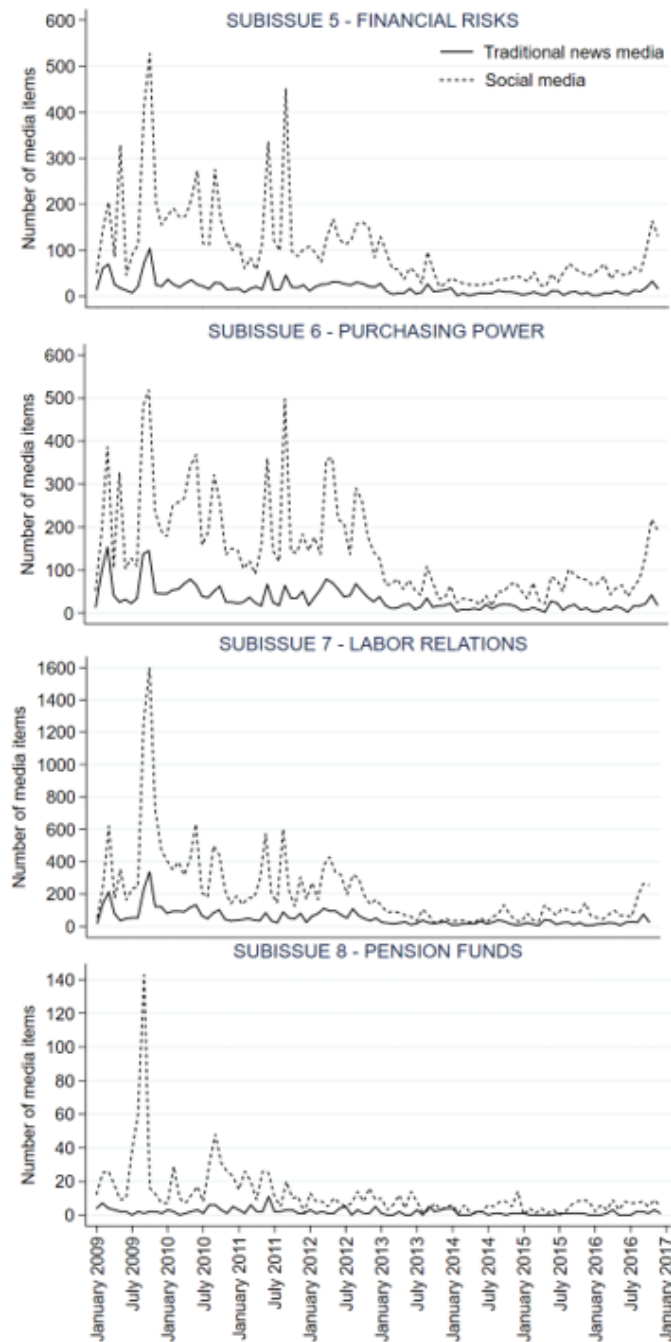
**Table 1. Overview of Subissues: Outcomes of Varimax Rotated Factor Analysis and Subissues' Presence in Traditional News Media and Social Media.**

Subissue labels and words	Total variance explained		Presence in percentages	
	Eigenvalue	% of variance	TM N = 5,002	SM N = 77,908
Sustainable employability (65 words; $\alpha = .906$ ) Work, employees, job, labor market, organization, people, care, sustainable	28.500	6.433 (8.830)	89.4	32.7
Pension arrangement (58 words; $\alpha = .846$ ) Amount, right, social security, gross, age, law, employer, AOW	10.617	2.397 (8.830)	73.7	33.1
Politics (46 words; $\alpha = .891$ ) CDA, VVD, D66, PVV, PvdA, parties, elections, coalition	7.092	1.601 (10.431)	69.7	20.1
European context (43 words; $\alpha = .876$ ) European, countries, Europe, economy, Greece, banks, crisis, growth	6.672	1.506 (11.937)	63.5	16.6
Financial risks (27 words; $\alpha = .845$ ) Return, BKR, assumptions, save, money, income, average, risk	5.844	1.319 (13.256)	36.2	13.1
Purchasing power (31 words; $\alpha = .839$ ) Purchasing power, rise, decline, expensive, euro, incomes, pay, contribution	5.487	1.239 (14.495)	62.7	17.6
Labor relations (46 words; $\alpha = .849$ ) FNV, employers, agreement, unions, Jongerius, trade union, pension agreement, allies	5.134	1.159 (15.654)	98.3	26.3
Pension funds (33 words; $\alpha = .679$ ) Fund investments, discount rate, main fund, basic salary, assets, employee contribution, pension fund, coverage ratio	4.753	1.073 (16.727)	3.6	1.5

*Note.* Subissues are presented with number of words per subissue and Cronbach's alpha in parentheses. Percentages of explained variance are presented with the cumulative percentage of variance in parentheses. TM = traditional news media; SM = social media.



**Figure 2. Attention to the sustainable employability, pension arrangement, politics, and European context subissues in traditional news media and social media.**



**Figure 3. Attention to the financial risks, purchasing power, labor relations, and pension funds subissues in traditional news media and social media.**

Figures 2 and 3 present the over-time dynamics of the presence of subissues in traditional news media and on social media (with varying values marked along the y axes). In general, the presence of subissues in newspaper articles and social media messages was higher in the beginning years than in the later years. An explanation for this could be that there was still room to set the agenda for the debate when the Dutch government first presented the idea of raising the retirement age in 2009.

In both traditional news media and social media coverage, a peak occurred around October 2009 for almost all subissues. During this period, the Dutch government reached an agreement for the first time on the bill of raising the retirement age.<sup>4</sup> Among all subissues (except pension funds), another peak occurred around October and November 2016. This could also be explained by political decision making: On October 31, 2016, the government announced that the retirement age for 2022 will increase to 67 years and three months. In general, the decreasing presence of subissues over the years could mean that the debate is fragmenting over time. Since the debate involves the interests of many stakeholders, it is likely that the debate fragmented into separate subissues. The debate also might have become less salient, because people are on the same page or due to a decline in interest and newsworthiness.

### ***Causal Relationship Between Traditional News Media and Social Media***

Table 2 presents the outcomes of the two pooled fixed effects time series models. In the first model we tested the effect of traditional news media on social media. Outcomes indicated that social media's own past has a significant positive influence on the current value of social media. If a subissue was present in the previous month, chances are greater that attention will be devoted to the same subissue in the following month. The key outcome is related to the influence of traditional news media on social media (shown in bold type in Table 2). Hypothesis 1a proposes that an increase in attention for a certain subissue in traditional news media will positively influence attention for that subissue on social media. Results support this hypothesis. We found a significant positive influence of lagged three-month averages of traditional news media on the current value of social media. Specifically, a one-unit increase in the attention for a subissue in traditional news media leads to a 0.449 increase in attention on social media. Hence, H1a is supported.

In the second model we tested the effect of social media on traditional news media. Results showed that the value of traditional news media in the previous month significantly and positively affected the value of traditional news media in the subsequent month (see Table 2). Hypothesis 1b proposes that an increase in attention for a certain subissue on social media leads to an increase in attention for that subissue in traditional news media. In line with this hypothesis, outcomes indicated a significant positive influence of lagged three-month averages of social media on the current value of traditional news media. A one-unit increase in social media's attention for a subissue results in a 0.023 increase in traditional news media's attention. Thus, H1b is also confirmed.

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<sup>4</sup> The bill was later withdrawn due to the fall of the Dutch government (Balkenende IV).

**Table 2. Overview of Pooled Findings: Direction and Significance of Effects.**

	Model 1 Social media	Model 2 Traditional news media
Social media ( $t - 1$ )	0.627*** (0.035)	
Social media ( $t - [1-3]$ )		<b>0.023**</b> (0.008)
Traditional news media ( $t - 1$ )		0.592*** (0.036)
Traditional news media ( $t - [1-3]$ )	<b>0.449*</b> (0.206)	
Organizational media (differenced; $t - 1$ )	2.069 (12.021)	-0.832 (2.296)
Constant	52.658*** (8.706)	9.711*** (1.662)
No. observations	644	644
$R^2$ within	0.448	0.430
$R^2$ between	0.994	0.985
$F(3, 634)$	171.24	159.09
Prob > $F$	.000	.000

Note. Coefficients are presented with standard errors in parentheses. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Diving more deeply into these effects, we used vector autoregression models to test the hypotheses once more, this time for each subissue separately. This provides insight into which subissues are potentially steering the effects. Outcomes of the Granger causality tests and cumulative impulse response functions are shown in Table 3. Addressing Hypothesis 1a, results indicate a significant effect of traditional news media on social media for two subissues: financial risks and purchasing power. The cumulative impulse response functions suggested positive effects, which are significant at all points in time.<sup>5</sup> For instance, after a time span of five months, a one-unit increase in the presence of the subissues financial risks and purchasing power in traditional news media resulted in increases of 5.03 and 4.61, respectively, in the presence of these subissues on social media (90% CI [0.97, 9.09], [1.04, 8.18]). In addition, the forecast error variance decompositions showed that, after five months, respectively, 72.4% and 77.2% of the variation in the monthly presence of the financial risks and purchasing power subissues on social media can be attributed to the monthly presence of these subissues in traditional news media, indicating a large effect. Thus, on the individual level of subissues, H1a is supported for two subissues.

<sup>5</sup> The graphs of the cumulative impulse response function are available on request from the corresponding author.

Addressing Hypothesis 1b, results of the Granger causality tests indicate a significant effect of social media on traditional news media for one of the subissues: pension arrangement (see Table 3). The cumulative impulse response function indicated an overall null effect that is significant only at the first point in time.<sup>5</sup> For example, after a five-month time span, a one-unit increase in the monthly presence of the pension arrangement subissue on social media resulted in a 0.03 decrease in the presence of this subissue in traditional news media (90% CI [-0.26, 0.20]). Moreover, the forecast error variance decomposition showed that, after five months, 3.85% of the variation in the monthly presence of the pension arrangement subissue in traditional news media can be attributed to the monthly presence of this subissue on social media. This indicates a fairly small effect. Hence, on the individual level of subissues, H1b is not supported.

**Table 3. Overview of Subissues Findings: Significance Levels of Granger Causality Tests and the Direction of Effects Based on Cumulative Impulse Response Functions.**

Subissue	Traditional news media →	Social media →
	Social media	Traditional news media
Sustainable employability (1 lag)	0	0
Pension arrangement (2 lags)	0	0*
Politics (1 lag)	0	0
European context (1 lag)	0	0
Financial risks (1 lag)	+*	0
Purchasing power (1 lag)	+*	0
Labor relations (1 lag)	0	0

\*  $p < .05$ .

### Discussion and Conclusion

This study extends the intermedia agenda-setting theory to the social media context. We investigated intermedia agenda-setting dynamics between the traditional news media agenda and the social media agenda in a policy reform debate, where a reciprocal influence was expected. Considering the joint effect of all subissues, the key finding is that both hypotheses can be confirmed. Traditional news media and social media positively influence each other in the attention to subissues. Testing the effects for each subissue separately yielded support only for the effect of traditional news media on social media (H1a). Because relatively little is known about intermedia agenda setting between the agendas of traditional news media and social media, this study's findings are relevant for theorizing this relationship. Our results indicate that social media have some power to set the agenda in public debates; however, traditional news media are (still) the more powerful agenda setter. Our findings provide support for the standing answer to the question of who sets the agenda: Traditional news media (Neuman et al., 2014).

Additionally, rather than focusing on general abstract issues, the study reported here contributes to previous research by exploring in detail a particular policy issue. Hence, our study sheds light on intermedia agenda-setting dynamics at the detailed level of subissues. Remarkably, by singling out the effects for each subissue separately, only three subissues triggered effects: pension arrangement, financial risks, and purchasing power. It seems, then, that intermedia agenda-setting effects are dependent on attributes of subissues. Although our study did not focus on these differences, we speculate that the degree



of obtrusiveness is important. The obtrusiveness hypothesis entails the notion that the potential influence of media is limited for issues that can be personally experienced by individuals (Soroka, 2002; Zucker, 1978). Following the distinction between obtrusive and unobtrusive issues, we would consider the pension arrangement and financial risks subissues and, to a lesser extent, the purchasing power subissue to be unobtrusive. The implication is that these issues refer to matters that are more abstract and system dependent and beyond individuals' everyday encounters and experiences. It is expected that with these more remote issues, media have more power in setting the agenda. In contrast, the sustainable employability subissue is more likely to impact individuals, because working individuals might personally experience (problems with) their vitality and capability of lifelong working. This might explain why media have less power in setting the agenda on this subissue. The distinction between obtrusive and unobtrusive subissues might be a valid explanation for whether effects are detected; however, future research is needed to provide empirical evidence for this line of reasoning.

Among this study's limitations, most importantly, it faces problems with omitted variable bias—an acknowledged issue in (intermedia) agenda-setting research. Although we did include organizational media, we did not control for several other contextual variables that might have impacted the independent and dependent variables, which means that our results may be biased (Vliegenthart & Montes, 2014). The debate on raising the retirement age does not take place solely in the media arena; various developments and events—such as the economic crisis, elections, or election campaigns—may have affected the debate and thus the attention devoted to the issue in media coverage. Hence, it is important for future research to take into account the larger social context (see, e.g., Park, Jang, Lee, & Yang, 2018)—for instance, by enriching the content data with data about the economy or political events. Furthermore, shortcomings in the data collection and analysis are attributable to certain (pragmatic) choices that were made. First, in the selection of social media messages, we did not exclude messages from organizations and traditional news media outlets. Therefore, it might be that the organizations or newspapers that we selected also appeared in the social media data. Since we consider social media as another type of societal media and not necessarily as the "voice of the public," this is not problematic as long as we are aware of it. In future research, it would be beneficial to make a distinction between stakeholders and assess the social networks of stakeholders on social media. Another issue with the data relates to organizational media. Our sample of press releases and annual reports of 14 organizations is too small to be representative of all organizational media. In addition, the selection of organizations was based on the availability of press releases and annual reports for the years 2009 to 2016. In this sense, the sample could be biased because we gathered data on only organizations that voluntarily disclose a lot of information.

Notwithstanding these limitations, by covering a relatively long time period and applying advanced time series techniques, our study is an important empirical contribution to the field of intermedia agenda setting. This study provides convincing evidence that the traditional news media agenda positively influences the subissue agenda on social media, which brings us one step closer to understanding the causal direction of the relationship between traditional news media and social media. In addition to this contribution to the body of communication science literature, our results have important pragmatic implications for the intermedia agenda-setting dynamics in the retirement age policy debate. Social media seem to have little influence on traditional news media; although it feels as if everyone can share their opinion and actively participate in the retirement age debate, these voices on social media do not spill over to traditional news

media. This has implications for how the debate develops, as journalists and their (elite) sources have a more influential voice in the policy debate than the voices on social media. Additionally, the insights into who is steering the agenda could be used by all types of stakeholders to become more aware of the role of different types of media in setting and shaping the debate. Moreover, the results shed light on how policy reforms—especially the policy reform of raising the retirement age—are perceived and shaped in the media arena. For instance, showing that sustainable employability and purchasing power are prominently discussed facets in the media arena, will increase awareness among politicians and policy makers of the concerns about workers' vitality, capability and spending power. In this sense, examining the policy reform debate provides insight into whether the measure is perceived as legitimate and what concerns prevail in society—insights that could be helpful for improving future communication on policy reforms with high societal impact.

Moving beyond intermedia agenda-setting dynamics and how the media agenda is set at the aggregate level, future research could build on the current study by addressing individual-level media effects and explore how media content influences individual perceptions about this policy issue.

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