



## UvA-DARE (Digital Academic Repository)

### News for you!

*News consumption in the digital society*

Vermeer, S.A.M.

### Publication date

2021

[Link to publication](#)

### Citation for published version (APA):

Vermeer, S. A. M. (2021). *News for you! News consumption in the digital society*. [Thesis, fully internal, Universiteit van Amsterdam].

### General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

### Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

*Chapter 1*

# Introduction

**A part of this introduction is under review as:** Vermeer, S.A.M., Kruikemeier, S., Trilling, D., & de Vreese, C.H. (2021). Content, consumer, context: Towards a theoretical framework for analyzing news consumption in the digital society.

## Introduction

Digital technologies have dramatically changed the very nature of news consumption. The possibilities to consume news seem endless. Citizens no longer have to wait for the morning paper or the evening news. Instead, they can consume news anytime, anywhere, and from a wide range of sources on a growing number of devices (de Vreese & Neijens, 2016). Citizens can consume news across broadcast television, radio, newspapers, news websites, news aggregators, social media, podcasts, alternative news sources, and many other news sources. Our media system is becoming increasingly hybrid (Chadwick, 2013), and citizens actively combine different sources into complex patterns of news consumption.

Digital technologies have not only increased the number of news sources. With the rise of digital technologies and platforms, news consumption is also becoming increasingly individualized and personalized (Pariser, 2011; Stroud, 2011). News consumption in the digital society strongly differs from a “one size fits all” context, characterized by a single homogeneous news supply for all citizens (e.g., reading a newspaper or watching a television program). In today’s news media landscape, every experience is unique. Social networks, in part, decide which news is consumed. Citizens encounter news that is sent, shared, or liked by their social ties, such as friends, family, and acquaintances. Additionally, algorithms increasingly tailor search results or sort news based on digital traces of personal data (e.g., a citizen’s past behavior, sociodemographics, social ties, or inferred similarity to other citizens). As a result, citizens increasingly consume news that algorithms select for them. This is already at the core of many news websites and social media platforms, such as Facebook and Twitter.

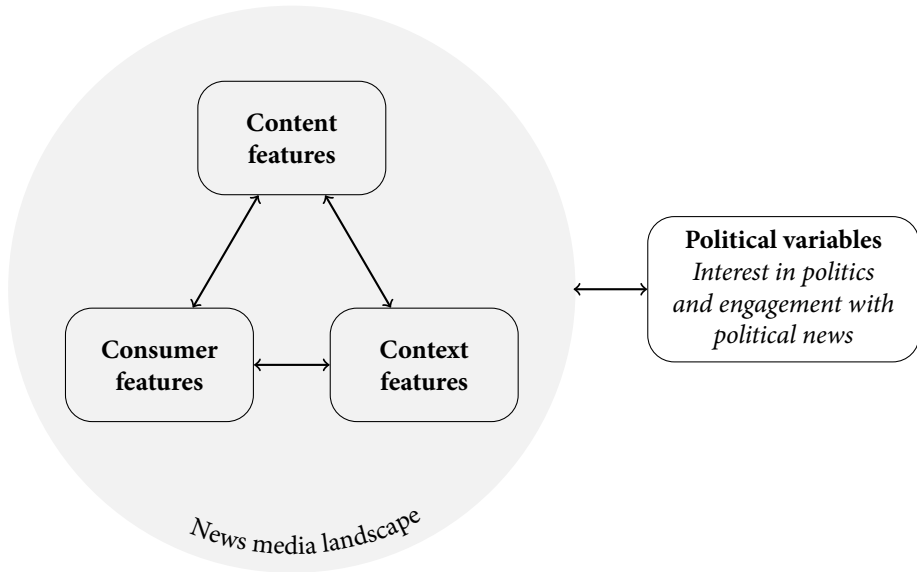
The rise of digital technologies has important implications for the way citizens are informed. It is therefore crucial to understand, examine, and think about news consumption in the digital society. Being informed about important and relevant public issues is a prerequisite for a well-functioning democracy (Eveland & Schmitt, 2015). News media are an important source of information about political and societal issues. News media play a crucial role in providing citizens with diverse, multifaceted perspectives on public issues. There exists a rich amount of literature showing that news consumption enhances interest in (a diverse set of) political and societal issues, and “[t]o be politically interested is one of the most important norms from a democratic perspective” (Strömbäck & Shehata, 2010, p. 575).

Traditionally, political interest has been shown to be a crucial indicator for voting, political knowledge, political participation, and attentiveness to political information (see e.g., de Vreese & Boomgaarden, 2006; Moeller & de Vreese, 2013). These are desirable outcomes in a *participatory democracy* or *deliberative democracy* (Bohman, 2007). In today's digital society, political activities with a lower threshold (e.g., sharing or liking political news on social media) can also be a consequence of political interest (see van Deth, 2014). Having more interest in diverse political and societal issues, arguably, will lead to more respect for different positions, ideas, and values that are present in society (although some scholars contest such arguments, see e.g., Mutz, 2002). In today's news media landscape, political interest plays a dual role. On the one hand, political interest can be considered as a dependent variable. Increased news consumption advances political interest. On the other hand, political interest can be considered as a predictor of news consumption. With the rise of digital technologies and the important role of social ties and algorithms, citizens who are more interested in politics are more likely to be directed to political news (i.e., resulting in a rich get richer model of exposure to political news). Such ideas are strongly rooted in the theoretical notions of virtuous circles (Norris, 2000) and reinforcing spirals (Slater, 2007).

Taken together, it is of crucial importance to understand *which* news is consumed by *whom*, and *how* (in which context). Existing studies are usually limited to one or two of those components, while it is ultimately the combination and interaction of all three components to study news consumption in the digital society. This dissertation examines the combined influence of all three components: (1) content features (i.e., *what?*, such as news topics), (2) consumer features (i.e., *who?*, such as sociodemographics, political interest), and especially (3) context features (i.e., *how?*, the role of social ties and algorithms, as opposed to a "one size fits all" context). As presented in Figure 1, this dissertation aims to shed light on how content, consumer, and context features can be integrated into one framework to better understand what shapes news consumption in the digital society, and, more importantly, how this affects interest in politics and engagement with political news. First, patterns of news consumption are studied (Chapter 2 and Chapter 3). Second, the role of political interest and engagement with political news is investigated (Chapter 4 and Chapter 5). The overall research question of this dissertation is:

*"To what extent do content features, consumer features, and context features of news media interact in affecting how citizens consume news and, ultimately, affect interest in politics and engagement with political news?"*

**Figure 1:** Content, consumer, context: News consumption in the digital society



To understand the extent to which news consumption patterns affect political interest and engagement with political news, theories from the fields of political communication, journalism studies, and mass communication are combined. Additionally, a multi-method design is applied. Various traditional methods are combined with state-of-the-art methods, including computational methods, to explore news consumption in the digital society.

In the remainder of this chapter, the dissertation is introduced in much greater detail. In the next section, the three components: content features, consumer features, and context features, are discussed separately. Following this description, the use of various methods is explained, and finally, the outline of the dissertation is presented.

## Content, consumer, context features

### Content features

The first factor that helps to explain news consumption in the digital society is content features. Content features refer to the subject matter, such as the *actual topic* of encountered news items (e.g., politics, entertainment). News media have a strong impact on citizens'

awareness of political and societal issues, as they decide which issues and events are covered and how these events are described in news messages (Chong & Druckman, 2007; Welbers, van Atteveldt, Kleinnijenhuis, & Ruigrok, 2018).

Communication science research has often focused on the distinction between 'hard news' and 'soft news' (for a detailed overview, see Reinemann, Stanyer, Scherr, & Legnante, 2012). Hard news has a clear focus on political and societal issues. It stresses public relevance. The presentation of hard news is often guided by ideas of journalistic objectivity and, thus, defined by a balanced and unbiased coverage (Curran, Iyengar, Brink Lund, & Salovaara-Moring, 2009). Soft news stresses personal consequences. Soft news can be characterized by emotional reporting (e.g., story ambiance, sensational presentation), and explicitly includes the opinions and interpretations of journalists (see e.g., Patterson, 2000).

Several studies have pointed towards the majority of news becoming softer over time, often referred to as 'tabloidization' or 'increasing infotainment' (Reinemann et al., 2012). With a growing number of news sources, audiences gradually fragmented, and competition among news outlets increased. Commercialized news media increasingly seek to grab attention with soft news to capture the attention of citizens (Tandoc, 2014). Hence, the growing supply of (and interest in) soft news seems to precede the supply of (and interest in) hard news (de Waal & Schoenbach, 2010). In today's media landscape, hard news therefore constantly competes with soft news (Prior, 2005); as many citizens generally prefer the latter (Prior, 2007).

Soft news and entertaining presentations of political news are often perceived as a threat to citizens' knowledge about politics and society (Prior, 2005, 2007). Soft news might pull politically uninterested citizens away from hard news sources (Prior, 2005), which could result in higher levels of political cynicism (Boukes & Boomgaarden, 2015). On the other hand, soft news can reach politically uninterested citizens that would otherwise not be exposed to political news at all (Baum & Jamison, 2006), so-called inadvertent or incidental exposure (Baum & Jamison, 2006; Zaller, 2003). News content becomes more attractive and more accessible for citizens who are less interested in political and societal issues. Although the style of soft news is often entertaining or sensational with a more pleasant, empathic, or exciting atmosphere (Vettehen, Nuijten, & Beentjes, 2005), soft news can be equally issue-oriented and informative as hard news. After all, by personalizing political matters or adding humor, soft news may attract those who otherwise might be lost to democracy and allow them to form political attitudes (see e.g., Boukes, 2019; Boukes, Boomgaarden, Moorman, & de Vreese, 2015) and facilitate political learning (Baum, 2003).

This dissertation addresses patterns of television news consumption (Chapter 2) and online news consumption (Chapter 3). Additionally, the consequences for citizens' interest in politics and engagement with political news are examined using an experimental design (Chapter 4) and longitudinal panel survey with two waves (Chapter 5). Chapter 2 and Chapter 4 particularly focus on political news. Chapter 3 and Chapter 5 focus on a wide variety of topics, such as political news and entertainment news.

### **Consumer features**

Beyond *which* news is consumed, patterns of news consumption also vary depending on citizens themselves (i.e., *who?*). A large and growing body of literature has indicated that not all citizens are equally likely to follow the news, as demographic factors (e.g., gender, age, education), and socioeconomic factors (e.g., socioeconomic status) are influencing news consumption (see e.g., David, 2009; Diehl, Barnidge, & Gil de Zúñiga, 2019; Lecheler & de Vreese, 2017; Shehata & Strömbäck, 2011; Strömbäck & Shehata, 2010). For example, citizens with higher incomes and higher levels of education are more likely to read newspapers, whereas those who have lower levels of education are equally or even more likely to use television news sources (Eveland & Cooper, 2013). Younger citizens are predominantly using online and social media to get informed about the world around them, whereas older citizens are more likely to watch television news or read newspapers (Newman, Fletcher, Schulz, Andi, & Nielsen, 2020).

In today's news media landscape—with more and more news sources to choose from—citizens have to become more selective when deciding what news sources and content to choose (Bennett & Iyengar, 2008; van Aelst et al., 2017). Selective exposure means that “people with limited interest in politics may bypass the news entirely, while the more attentive may tailor their exposure to suit their political preferences” (Iyengar, 2014, p. 59). In turn, “the greater media choice there is, the more selective people have to be; and the more selective people have to be, the more important their preferences become” (Strömbäck, Falasca, & Kruikemeier, 2018, p. 2). Citizens' preferences thus play an increasingly important role in explaining news consumption in the digital society (see e.g. Prior, 2007; Stroud, 2011). With increased media choice, politically interested citizens can access more information and increase their political knowledge, and those who prefer non-political news can easily escape it, pick up less political information, and opt for more entertaining options (Sunstein, 2007). Since news users are more empowered and have more control over their information flows, they can also decide not to consume any news at all. News avoiding behavior might be more

prevalent among those who are less interested in politics (Bos, Kruike-meier, & de Vreese, 2016; Prior, 2007). Besides, research on selective exposure argues that (extremism of) political leaning, at least in the U.S., exerts an influence on the selection of and interest in news content. While these effects have been demonstrated, their role in a complex news media environment in multi-party systems is not fully understood yet, as consistent exposure to a fully coherent partisan media diet hardly occurs (Zuiderveen Borgesius et al., 2016). Nevertheless, it is reasonable to assume that such political attitudes matter in shaping citizens' news consumption and how news consumption affects interest in diverse topics and knowledge about politics and society.

In this dissertation, various political variables are examined, including political ideology, political knowledge, and news media trust. Yet, political interest is one of the main variables (both a driver of news consumption as well as a consequence of news consumption), as it has a strong positive relationship with important other political variables. Political interest refers to someone's general interest in politics. This dissertation examines whether politically interested citizens are more likely to follow political news compared to less interested citizens and that due to the context in which news consumption happens, those effects are accelerated. In Chapter 2, the roles of political interest and political ideology in television news consumption are examined. In Chapter 3, online news consumption of politically interested citizens is compared with citizens who are less politically interested. Consequently, it can be expected that those who are already politically interested will show increased levels of political interest due to their media consumption. The consequences for citizens' interest in politics and engagement with political news are explored in Chapter 4 and Chapter 5.

## **Context features**

While content features and consumer features have an established place in communication science research, the context in which news is consumed received less attention. It is important to examine context features because our news media landscape is becoming increasingly hybrid (see e.g., Chadwick, 2013). Context is addressed as the way in which users encounter news. Unlike news consumption in a traditional "one size fits all" context (such as reading a newspaper or watching television news), news consumption in today's digital society is unique for all citizens—for example with different responses to identical search queries (Pariser, 2011). News consumption is no longer shaped predominantly by traditional gatekeepers but also by citizens themselves, their social ties, and algorithms.

Patterns of news consumption can be shaped by social ties. Citizens come across news that has been sent, shared, or liked by their friends, family, or acquaintances (Newman et al.,



2020; Trilling, Tolochko, & Burscher, 2017). It can be expected that individuals who have an online network with ties who are more interested in politics are more likely to be exposed to political news, whereas those with ties who are less interested in politics are probably less often exposed to political news. Besides, as selective exposure theory suggests, citizens in a more homogeneous network are likely to be mainly exposed to news that represents topics and ideological stances that their social ties prefer as well (Halberstam & Knight, 2016; Stroud, 2010). The more homogeneous a network, the stronger these effects are expected to be. In a more heterogeneous network, in general, people are more likely to be exposed to political news, as at least some of their ties will be interested in politics—a typical example of the benefits of social capital. Yet, users in a heterogeneous social network could self-censor and avoid sharing content (Child & Starcher, 2016). Social networks may, thus, in part, decide which news is encountered online (V. Y. Chen, 2020).

Similar feedback loops might occur for algorithmically personalized news sources. Based on, for example, citizens' past behavior, sociodemographics, or inferred similarity to other citizens, algorithms automatically recommend news content an individual is interested in, but is also likely to agree with, which could result in 'echo chambers' (Sunstein, 2007). Citizens highly interested in politics are more likely to be exposed to political news, whereas citizens that are not necessarily politically interested are not exposed to political news. Such processes effectively fuel a spiraling process and thus can have serious implications for citizens' opinions, their interest in politics, and their participation. As a result, news users might effectively consume a highly individualized and personalized news diet (see e.g., Pariser, 2011; Stroud, 2011), which results in 'filter bubbles'. Yet, to date, evidence has been conflicting (see e.g., Bakshy, Messing, & Adamic, 2015; Barberá, Jost, Nagler, Tucker, & Bonneau, 2015; Dubois & Blank, 2018; Zuiderveen Borgesius et al., 2016). According to Moeller, Helberger, and Makhortykh (2019) an important consequence of focusing on 'filter bubbles' in much of the current debate is that the role of digital platforms in the wider news media landscape is neglected.

This dissertation aims to investigate the role of digital technologies and platforms in today's news media landscape. More specifically, it examines how news consumption is influenced by various actors, including citizens themselves, their social ties, and algorithms. Chapter 2 investigates news consumption in a "one size fits all" context, namely broadcast television. Next, this dissertation moves to a setting with unique user experiences. Chapter 3 examines news consumption patterns across a wide variety of news sources, including search engines, news websites, as well as social media platforms. In Chapter 4, an experiment is conducted to examine whether discussing news content with social ties could influence political variables,

such as political interest and political knowledge. In Chapter 5, the reciprocal effects between political interest and news use across a wide variety of news sources are examined.

## **Towards a framework for understanding news consumption in the digital society**

Existing studies are usually limited to one or two groups of features, while it is ultimately the combination and interaction of all three groups of features—content, consumer, and context features—to study news consumption. The power to shape or limit news exposure is nowadays distributed among citizens themselves, their social ties, and algorithms (Chadwick, 2013; Thorson & Wells, 2016). Theoretical and empirical assumptions about news consumption and its implications, therefore, need to consider the combined influence of content features, consumer features, and particularly context features, which are of decisive influence online. In this dissertation, all three components are integrated into one framework to better understand what shapes news consumption in the contemporary media ecosystem. Developing this CCC-model is important because the *combined* influence shapes news consumption in the digital society. For instance, when we investigate how characteristics of users influence the choice for specific content (such as research on filter bubbles and selective exposure does), we need to take into account that these effects play out differently in different contexts. Particularly, when investigating digital platforms, we need to understand not only the direct relationship between, for example, political interest and news consumption, but also the ways in which citizens' behavior and their social ties influence algorithmic systems (see e.g., Thorson, Cotter, Medeiros, & Pak, 2021). Integrating content, consumer, and context features into one framework enables the development of a new understanding of examining and thinking about news consumption in the digital society. This approach reframes research questions in debates such as polarization, news avoidance, selective and incidental exposure.

## **Research design**

Today's news media landscape has complicated the measurement of news consumption, given that citizens are exposed to an enormous amount of information anytime, anywhere, and from a wide range of sources on a growing number of devices (de Vreese & Neijens, 2016). It is, therefore, increasingly challenging to understand *which* news is consumed by *whom*, and *how* (in which context). Computational tools and methods can help to tackle this challenge (for a detailed overview, see Hilbert et al., 2019) and improve measures of news

exposure. This emerging discipline is often referred to as *Computational Social Science* (Lazer et al., 2009) or even *Computational Communication Science* (Shah, Cappella Ramesh, & Neuman, 2015). Computational tools and methods offer new opportunities to *measure* and *analyze* news consumption in the digital society.

## Data collection

This dissertation draws upon a multi-method design. Traditional methods are combined with new and innovative methods, including computational methods, to explore news consumption in the digital society. To understand patterns of news consumption, this dissertation relies on two broad types of news consumption measures: self-reports and passive measurement methods.

### Self-reports

Self-report questions are the most frequently used approach to measuring news consumption. Self-report questions can, for example, rely on unaided recall (e.g., ‘*How many days in a typical week do you read the newspaper?*’) or proven recall (e.g., ‘*What was the news item about?*’) (for a detailed overview, see de Vreese & Neijens, 2016). Self-report measures are easy to include in a survey or experiment. Moreover, including other questions creates the possibility to correlate patterns of news consumption with sociodemographics or political preferences, such as political interest and political ideology.

There are however potential problems with self-reports. Respondents need to understand what the researcher means with for example ‘news’ and, in turn, which television programs or websites contain (sufficient) news to justify inclusion. The accuracy of self-reported news consumption also depends on the capability of respondents to correctly recall and estimate the frequency of past behavior (Prior, 2009; Vraga, Bode, Smithson, & Troller-Renfree, 2016). For instance, recalling whether one has used social media yesterday is an easier task than recalling which news items they encountered in their news feed. Respondents can underestimate or overestimate actual behavior and they can even choose to report a socially desirable answer.

### Passive measurement methods

To overcome some of the problems of self-reports, a second type of measuring news consumption is automatic registration (for a detailed overview, see Araujo, Wonneberger, Neijens, & de Vreese, 2017; Vraga & Tully, 2018). Digital tools have extended the possibilities for passive registration systems a great deal. There are various types of passive registration systems varying from eye tracking software (Kruikemeier, Lecheler, & Boyer, 2018) to measurements of mobile behavior (e.g., Ohme, Araujo, de Vreese, & Piotrowski, 2020). In

this dissertation, audience-meter data (**Chapter 2**) and online tracking data (**Chapter 3**) are collected. First, audience meters electronically record information of individual viewing behavior (for a detailed overview, see Wonneberger, Schoenbach, & van Meurs, 2013a). Audience meters can be attached to a (smart) television set, video recorder, DVD player/recorder, hard disk recorder, set-top box, media center, and possibly other devices connected to a television within a household (Stichting KijkOnderzoek, 2018). By relying on audio matching, an audience meter can automatically record the station to which the television set is tuned. To register *who* is watching, viewers must log when they start and stop viewing television themselves using a remote control. In short, an audience meter data set contains information indicating “*who* watched *which station when* and *for how long on which television set*” (Stichting KijkOnderzoek, 2018, p. 55). As audience-meter data are recorded electronically, they precisely reflect viewing behavior. Another advantage of using electronically recorded audience-meter data, and passive measurement methods in general, is the exclusion of recall as a source of measurement error. Yet, audience-meter data, too, do not yield perfect measures but have their problems of validity. The main issues concern the quality of the sample as well as the accuracy of the measurements. To tackle such challenges, this dissertation relies on data from *Stichting KijkOnderzoek* (i.e., the council for Dutch Television Audience Measurement). This data set does not include any significant shortcomings in the sample selection procedures, in the gathering and processing of the data, or quality control. This allows for a highly stable way of data collection with consistent and comparable measures over time (for a detailed overview, see Stichting KijkOnderzoek, 2018).

Another form of passive measurement that is employed in this dissertation is tracking online user behavior. Online tracking data can be collected using tracking software (e.g., tracking in-browser activities using a plug-in). Tracking software automatically monitors and registers online behavior of specified and authenticated users. As users type into a search engine or visit a social media platform, they begin to navigate online. Tracking software monitors users from the moment they arrive online and the choices they (un)consciously undertake to arrive at the content they want. In a digital information environment, every experience is unique. Online tracking data provides insights into actual individually encountered news (for a detailed overview, see Haim & Nienierza, 2019). There are shortcomings to such approaches as well. Privacy concerns, for example, may prevent respondents to (fully) participate. To guarantee respondents’ privacy as much as possible, this dissertation explicitly excluded sensitive information.

To obtain an elaborate and thorough understanding of news consumption in the digital society, the rich nature of self-reports (i.e., survey data) is combined with the precision of

passive measurement methods (i.e., audience-meter data, online tracking data). Capturing news consumption and connecting it to sociodemographics and political preferences allows us to gain insights into *which* news is consumed by *whom*, and *how* (in which context).

To test more specifically the consequences for citizens' interest in politics and engagement with political news, this dissertation also relies on experimental data and longitudinal panel data. In **Chapter 4**, an experimental study among adolescents is conducted. This study was set out to uncover the effects of sharing and discussing political news in the context of instant messaging apps. Generally, experiments help to establish cause and effect (Wimmer & Dominick, 2011). Since experiments allow us to have control over the news content respondents are exposed to, it can be explored to what extent digital platforms have an impact on interest in politics and engagement with political news. Finally, **Chapter 5** relies on two-wave panel survey data. Self-report questions were used to measure news consumption. These questions were combined with political preferences (i.e., political interest, news media trust). This offers an insight into the consequences of news consumption across a wide variety of news outlets. Two-wave panel survey data enables us not only to examine the causal but also the reciprocal effects between news consumption and political preferences in an advanced way. By utilizing panel data with a representative sample of the Dutch population, the implications for the way citizens are informed at large can be examined.

## Data analysis

The amount of data that can be collected has increased dramatically. This is exciting but also presents new challenges. To tackle such challenges, knowledge, and insights from computer science are used. Computational methods allow researchers to move towards valid and reliable research using large data sets. In this way, they offer substantial added value to communication science research. Computational methods have also created a wide range of opportunities to analyze patterns of news consumption. In this dissertation, several advanced and innovative methods in the field of text and network analysis are combined.

## Automated content analysis

Automated content analysis methods are applied to extract meaningful features from large-scale data (for a detailed overview, see Boumans & Trilling, 2016). For example, automated content analysis can be applied to automatically determine whether a certain text covers political and societal issues or not. Automated content analysis is especially interesting when the data set of interest is so large that it is not feasible to code all content manually. Automated content analysis methods do not only save time and money but also

provide additional evidence for what scholars might already have found using qualitative or small-scale data (Boumans & Trilling, 2016). By doing so, automated content analysis can help to sketch the bigger picture.

In this dissertation, various automated content analysis methods are applied to classify political content. In **Chapter 2**, a knowledge base (Wikipedia, DBpedia, Wikidata) is used to automatically assign hundreds of thousands of different topics at different levels of abstraction to subtitles of television programs. Relying on existing infrastructure (e.g., a comprehensive knowledge base that can be combined with state-of-the-art natural language processing techniques) is an efficient and straightforward approach to extract a wide variety of topics from textual sources of political content. The source code is not always publicly available. Yet, by validating the approach, a knowledge base can extract meaningful features from large data sets. In **Chapter 3**, supervised machine learning is used to determine what type of news is covered in online news items and social media posts. Supervised machine learning is highly useful for deductive coding of large data sets. As the tool needs to be tailored to the task, it requires a relatively high degree of initial manual labor. A smaller subset is coded manually. Next, the manually coded data is used to train a classifier to automatically code the topic of online news items. Although the classifier cannot perform better than human coding, a supervised machine learning method increases efficiency, as well as transparency and reproducibility (Boumans & Trilling, 2016).

### **Network analysis**

Network analysis refers to a set of techniques that can be used to model the relations and processes among various entities (e.g., individuals or issues). A network consists of a certain number of entities (i.e., nodes) with connections between them (i.e., edges). For example, the nodes of a social network are individuals and the edges represent family, friendship, and acquaintance ties. The structure of a news website can also be represented as a network, in which the nodes represent Web pages and edges represent links from one page to another. Network analysis can be applied to study cross-platform patterns of news consumption. Given the size of many networks, network analysis has strong computational aspects, actively borrowing from database management as well as data mining (Barabási, 2006). Network analysis can be applied to extract information from large-scale data. Several companies (e.g., Facebook, Google, Twitter) base their technology and business model on networks, for example, to develop accurate friendship or news recommendations (Barabási, 2006).

In this dissertation, various network analysis techniques are applied. In **Chapter 2**, a network approach is used to detect subgroups of topics. It is examined which topics co-occur in a particular part of a television program. A network of topics is created based on the co-occurrences of topics. Revealing smaller subgroups of topics helps the identification of topics that are theoretically helpful, but perhaps understudied or previously unknown (Grimmer & Stewart, 2013). In **Chapter 3**, the dissertation moves from identifying subgroups of topics to analyzing patterns of online news consumption. To do so, a technique from data mining is used. Using Markov chains, the likelihood of news consumers changing from one news website to another website is examined. Markov chains provide an effective and compact way to represent online user behavior and are especially suited to detect websites that are often viewed in a sequence (Vermeer & Trilling, 2020). **Chapter 4** examines the effects of sharing and discussing political news in the context of instant messaging app. To do so, a field experiment is conducted. By linking friends to each other, social network analysis is used to create groups consisting of densely connected individuals. As a result, respondents with strong ties were assigned to the same WhatsApp group. Network analysis can help in understanding whether patterns of news consumption can be shaped by social ties. Taken together, network analysis provides novel tools and perspectives to analyze news consumption in the digital society.

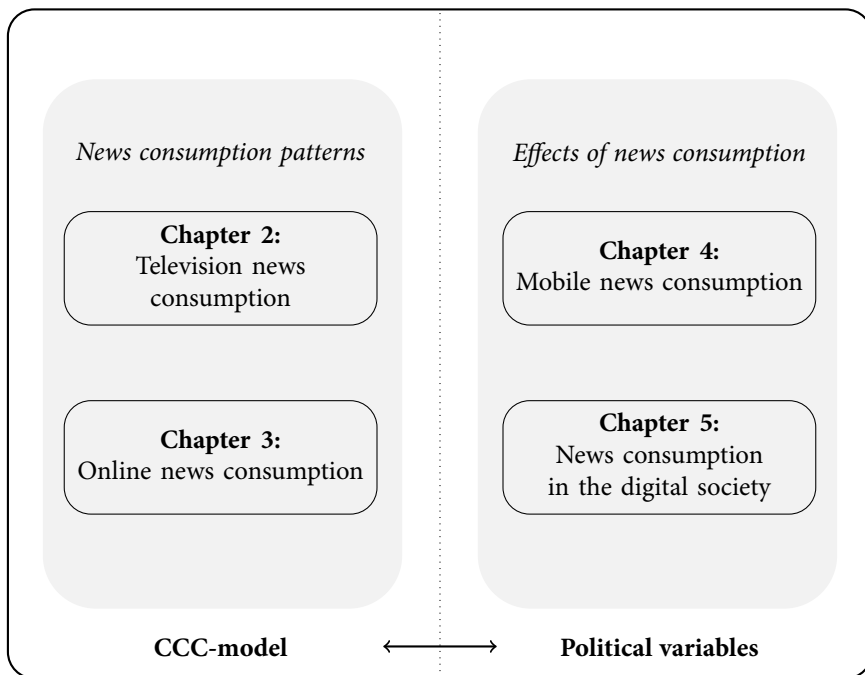
## Outline of the dissertation

This dissertation consists of four empirical studies (see Figure 2 for an overview). Each chapter documents an individual study and the chapters are self-containing. Each study contributes to the overall research aim of studying news consumption in the digital society. In the next paragraphs, it is explained how the chapters are related. Chapters 2 and 3 examine patterns of news consumption (i.e., the CCC-model). Chapters 4 and 5 investigate the causal and reciprocal effects between news consumption patterns and various political variables (e.g., political interest, political knowledge).

This dissertation starts with an exploratory study on television news consumption. By combining audience-meter data with survey data and subtitle data, **Chapter 2** investigates *who* is exposed to *which* (political) topic in *what type of television program*. It is examined how content features (i.e., news topics) and consumer features (i.e., political interest and political ideology) affect patterns of television news consumption. This answers fundamental

questions regarding the increased prominence of soft news and entertaining forms of political news (Reinemann et al., 2012). It can be argued that television programs combining political information with entertainment (e.g., late-night talk shows, satire), reach politically uninterested viewers that would otherwise not be exposed to political news at all. However, television formats and genres are not purely hard or soft, nor purely entertaining or informing. Instead, viewers can be exposed to various political topics in (different parts of) a television program. It is investigated to what extent exposure to political topics on television is determined by political preferences, such as political interest and political ideology. This approach gives us more insights into the interaction between content and consumer features to study television news consumption.

**Figure 2:** Outline of the dissertation



The dissertation moves from television to online news consumption. Or, in other words, it moves from a “one size fits all” context to a setting with unique user experiences. In the digital society, citizens actively combine different websites, varying from search engines to social media and online news websites, into complex patterns of news consumption. By



passively tracking online news consumers, **Chapter 3** examines how content features (i.e., news topics), consumer features (i.e., political interest), and, most importantly, context features (i.e., type of websites) affect patterns of online news consumption. The study examines how citizens navigate today's news media landscape. It also assesses whether it makes the selection of particular news topics (e.g., politics, entertainment) more likely. This innovative approach gives us more insights into the interaction between content, consumer, and context features in online news consumption.

The previous chapters focus on patterns of news consumption. Yet, little is known about the effects of news consumption on political interest and engagement with political news. By conducting an experimental study among adolescents, **Chapter 4** examines the effects of sharing and discussing political news in the context of instant messaging apps. Such digital tools allow us to use *apps as labs*. For seven days, adolescents were part of a small WhatsApp group and either had to read or read *and* discuss political news. The study differentiates between affective responses (i.e., emotions, feelings), behavioral responses (i.e., actions and behavioral intentions, including political interest), and cognitive responses (i.e., political knowledge) to political news. By doing so, Chapter 4 offers an empirical exploration of the democratic implications of the increasing popularity of mobile news consumption, and instant messaging apps in particular.

Using two-wave panel survey data, **Chapter 5** examines not only the causal but also the *reciprocal* effects between news consumption and political preferences (i.e., political interest, news media trust). This idea is rooted in the theoretical notions of virtuous circles (Norris, 2000) and reinforcing spirals (Slater, 2007). By utilizing survey data with a representative sample, news consumption in the digital society at large is examined. Data for this study was collected just before and during the COVID-19 pandemic. Chapter 5 therefore also contributes to the literature by advancing the understanding of changes in news consumption during a major public health crisis.

To conclude, in **Chapter 6**, the last and final chapter of this dissertation, the theoretical, practical, and societal implications of the four studies are discussed. This chapter also suggests how researchers in the future can contribute to what has yet to be identified about news consumption in the digital society.