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FRAMING VACCINES IN THE MEDIA

An examination of the United States media coverage of the Measles, Mumps
and Rubella vaccine and the Human Papillomavirus vaccine

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Abstract

This study examined the media coverage in two different online media outlets, the *New York Times* and *Fox News*, in their reporting on two different vaccines, the Human Papillomavirus (HPV) and the measles, mumps and rubella (MMR) vaccine. Using a comprehensive understanding of framing theory and qualitative content analysis to uncover media frames, it examined the media coverage of these two public health interventions during two different periods. Coverage of the HPV vaccine was examined during a period of relatively low political and media attention. The coverage of the MMR vaccine was examined during a period of relatively high public, political and media attention connected to the recent measles outbreaks in the United States. Findings from the sample of media coverage demonstrated that scientific frames dominated the coverage of the HPV vaccine, and that the MMR vaccine was framed in terms of political conflict and competing interests. The framing of the MMR vaccine also portrayed the anti-vaccination movement as a disruptive force in society. Finally, a typology of frames was presented for future research to build on.

Key words: framing, media frames, vaccines, vaccination, science communication, MMR, HPV, *Fox News*, the *New York Times*.

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1 Introduction

1.1 Societal and academic relevance

The media comprise a principle arena within which science-related controversies and public health issues come to the attention of decision makers, interest groups and the public (Nisbet, Brossard & Kroepsch, 2003; Nisbet & Huye, 2006; Briggs & Hallin, 2016). Not only do the media provide an arena for making such issues more accessible to the public, but the media, more specifically the news media – through framing issues in a certain way – shape how members of the public think about these issues (Gollust, LoRusso, Nagler & Fowler, 2016). A comprehensive understanding of framing offers a rich explanation for how various actors attempt to define science-related issues and how the media ultimately frame these issues (Nisbet & Scheufele, 2009). Public health news is a highly constructed and contested space of policymaking and scientific understanding (Briggs & Hallin, 2016) which raises important questions of how these issues are presented in the media. This is the dynamic to which the study will attend.

Two public health interventions in the United States (US), the Human Papillomavirus (HPV) vaccine and the measles, mumps and rubella (MMR) vaccine, both involving “decision-relevant science” (Kahan, 2017: 165) have attracted political, public and media attention in recent years and provoked popular resistance as well as politically divided attitudes towards these interventions (Gostin, 2011; Siddiqui, Salmon & Omer, 2013; Dubé, Laberge, Guay, Bramadat, Roy & Bettinger, 2013; Baumgaertner, Carlisle & Justwan, 2018; Constantine & Jerman, 2007).

According to frame building theories these issues were, at the time of examination, in two different stages in the policy and framing cycle (Nisbet et al., 2003; Nisbet & Huye, 2006; Fowler, Gollust, Dempsey, Lantz & Ubel, 2012). The MMR vaccine was in an overtly political arena during 2019, due to the measles outbreak prompting legislative debates in different states. During the year of 2019 alone, three states enacted legislation regarding vaccination (NSCL, 2020). Generally, the possible intensity of conflict and actors granted access and input are high during such periods, and the media tend to frame issues in terms of morality, ethics, strategy and conflict (Nisbet et al., 2003). Conversely, the HPV vaccine was in an a more technical and administrative arena. During the period of 2011-2019, only one state

enacted legislation (NSCL, 2018). Generally, few actors beyond science actors have authority in this arena, and the media tend to promote scientific perspectives and frames (Nisbet et al., 2003; Nisbet & Huye, 2006). This provides an intriguing context for examining how the news media frames these issues in times when the public, political and media attention is high and when it is relatively low.

Outbreaks of disease are common fodder for political debate and public discourse (Greenberg, Capurro, Dubé & Driedger, 2019). The recent measles outbreaks in the US have thrust the issue into the media spotlight again, reigniting a historic controversy about public health; sparking public dialogue about the risks of not vaccinating children, personal choice and parental rights; and fueling controversial legislative debates on mandatory vaccination (Cataldi, Dempsey & O’Leary, 2016; Gostin, 2015). It typifies competition among various strategic actors for the attention of the public providing the media with opportunities to negotiate between competing perspectives (Nisbet et al., 2003).

Media studies of the MMR vaccine has often focused on a specific controversy regarding false scientific claims of the vaccine’s association with autism (Clarke, 2008; Clarke & Dixon, 2012; Holton, Weberling, Clarke & Smith, 2012). However, the public debate and skepticism toward the vaccine reaches beyond this particular association to include political and moral convictions (Buckman, Liu, Cortright, Tumin & Syed, 2020). Therefore, this study will move beyond this particular controversy, to examine how the national news media framed the MMR vaccine and vaccination during a period of disease outbreak and legislative debates.

Media studies tracking the news coverage of the HPV vaccine, have put forth political conflict as a key theme during active state debates about the issue in 2006-2008 (Gollust et al., 2016). Scholars have argued that news coverage of political controversy can stick. It has been assumed that once an issue has earned and sustained a political valence, this factor will remain an important component of media presentation (Gollust et al., 2016; Fowler & Gollust, 2015). The issue re-emerged on the public scene a few years later, in 2011, coinciding with active state debates on legislation and publicized political criticism of the HPV vaccine as well as legal measures to promote it (Krakow & Rogers, 2016). Media studies of national media coverage of this period has shown that more than half of the stories focused primarily on political events, limiting the space for detailed health information about the vaccine (Krakow & Rogers, 2016).

The issue garnered little scholarly attention since (Gollust et al., 2016). Therefore, this study will pick up where the latest content analysis left off to examine how national news media framed the HPV vaccine and vaccination during a period of relatively low intensity of major political events pertaining to the issue (NSCL, 2018). A theoretically intriguing project

seeing as longitudinal research approaches inform us that when issues are no longer politically relevant – when public and political attention decline – it is more difficult for reporters to fit the issue into narrative structures such as politically-oriented frames (Nisbet & Huye, 2006).

Scholars have focused on the news media specifically, seeing as it helps stimulate debate over complex public health issues (Gollust et al., 2016). While there are certainly many factors that influence public perceptions vaccines and vaccination, the news media is one of them (Gollust et al., 2016; Cataldi et al., 2020). The principle focus of the present study is the news media's role in the constitution of *public* understandings of these issues, and for this purpose, news media outlets remain at the center of the analysis (Briggs & Hallin, 2016). Given its role as an important source for information on which the public relies for information about these issues (Gollust et al., 2016; Cates, Shafer, Carpentier, Reiter, Brewer, McRee, 2010; Quinn, Jamison & Freimuth, 2020; Cataldi et al., 2016).

The changing media system in the US is increasingly fragmented, limiting media studies in their ability to capture the full complexity of information and discourse (Briggs & Hallin, 2016). The report turns to examine the frames in the online news media outlets the *New York Times* and *Fox News*.

Studies indicate that Americans prefer watching to reading the news (Pew Research Center, 2018). However, among those who prefer to read news, online news dominate (Pew Research Center, 2018). In that sense, these two online news outlets represent case studies of framing vaccines and vaccination in US national news media.

1.2 Research objective

Against this background, the present study examines the frames in media coverage of the HPV- and MMR-vaccines and vaccinations, in the *New York Times* and *Fox News* respectively. The media coverage of the respective outlets is examined by means of qualitative content analysis and guided by a comprehensive understanding of the factors that contribute to the process of media framing, namely, frame building and framing theory. In short, the aim is to examine a sample of the national media coverage of the HPV vaccine in the years of 2012–2019, following the latest content analysis and publicized political controversy surrounding the vaccine in 2011 (Krakow & Rogers, 2016), as well as a sample of the national media coverage of the MMR vaccine during the highly publicized measles outbreak and legislative debates of 2019.

Analyses of media coverage during these different periods can help media scholars and science communications scholars understand how the media tend to frame issues in contexts of high contra low political, public and media attention. In an inductive approach to the empirical material, the present study sets out to answer the following research questions:

(a) what frames are featured in media coverage on the MMR- and HPV vaccine in the selected online media outlets respectively?

(b) how might the framing be understood against the background of an ideological divide in the support for two different vaccines?

2 Vaccines in the public sphere

The following section provides a brief background of the two vaccines and the diseases which they are meant to prevent. This is followed by a discussion regarding the extent to which the respective vaccines have become imbued with political meaning in the public sphere. Finally, it provides a brief background to public vaccination attitudes in relation to ideology.

2.1 The HPV and MMR vaccines

The HPV vaccine, *Gardasil*, was licensed in 2006 by the US Food and Drug Administration (FDA) for girls and women age 9–26; in 2009 for males age 9–26; and later for eligible persons through 45 years of age, in 2018 (IOM, 2012a; FDA, 2018). HPV vaccines are safe and effective in protecting against diseases, they have the potential to prevent more than 90 % of HPV-attributable cancers (CDC, 2020a). Despite this, HPV uptake is relatively low among US adolescents. The latest National Immunization Survey-Teen from 2017 estimates that only half of adolescents (49 %) have completed their HPV vaccinations, 53 % of adolescent girls and 44 % of adolescent boys (CDC, 2018).

This is likely in part due to the exceptionally low rate of implementing state-level requirements for the HPV-vaccine, so-called vaccine mandates (Saulsberry, Fowler, Nagler & Gollust, 2019). US vaccination policy has traditionally centered around school requirements, which have been effective tools in achieving high coverage rates and decreasing the incidence of vaccine-preventable diseases (Saulsberry et al., 2019). Currently, only three states, District of Columbia, Virginia, and Rhode Island require HPV-vaccination for school attendance (NSCL, 2018). Most recently, Rhode Island enacted legislation in 2015 (NSCL, 2018).

Measles, mumps and rubella are highly contagious diseases, 90 % of non-immune persons who are exposed to the measles virus will develop the disease (CDC, 2019b). These diseases can be prevented by the combination vaccine, abbreviated the MMR vaccine. The CDC recommends all children get two doses of MMR vaccine, one at the age of 12 through 15 months of age, and the second at 4 through 6 years of age. It is also recommended for young adults and adults who do not have presumptive evidence of immunity (CDC, 2019a). The vaccine has a long record of safety, and serious adverse reactions from MMR are rare (Kwong & Ambizas,

2019). Research also reports strong evidence favoring a rejection of a causal relationship between MMR-vaccine and autism (IOM, 2012b).

Again, school vaccination laws have played a key role in the control of vaccine preventable diseases in the US, preventing the spread of disease through high vaccination coverage. All 50 states have legislation requiring the MMR-vaccine (NCSL, 2020). States laws also offer *exemptions* to school vaccination requirements based on medical, religious and philosophical grounds, which vary from state to state. As a consequence, the number and size of measles-vulnerable areas and significant measles outbreaks in the US are increasing, especially in metropolitan areas of states that permit philosophical exemptions (Olive, Hotez, Damania & Nolan, 2018). In 2019 alone, three states: Washington, Maine and New York, removed exemptions from vaccination laws (NSCL, 2020).

2.2 The public debate on the vaccines

After the FDA approved the vaccine in 2006, there was an upswing in media attention regarding the issue. The media picked up on the controversial statements posed by religious conservative interest groups expressing concern that the availability of a vaccine against sexually transmitted disease would promote riskier sexual behavior (Fowler et al., 2012). Research has found that news stories often featured competing messages from liberal and conservative advocacy groups presenting their sides prescription and implications of policy implementation (Fowler et al., 2012).

During the phase of active state debates over the vaccine, news coverage began using politically-oriented frames, with news stories increasingly mentioning political sources endorsing or highlighting political conflict or cast the issue of vaccination in context of conflict and partisan divides over the issue (Fowler & Gollust, 2015). Opposition to vaccine mandates were justified with ideologically based arguments, including concerns about the sexually transmitted nature of the vaccine and general resistance to government intrusion on parental autonomy (Colgrove, Abiola & Mello, 2010). Republican presidential candidate debates further vocalized these concerns about the “dangerous drug” claiming “[t]here [was] no government purpose served for having little girls inoculated at the force and compulsion of the government” (Bachmann & Santorum in Gostin, 2011: 1699).

Scholars argue that the HPV vaccine has been subject to a strategic effort to portray the vaccine as controversial for political ends, by questioning the scientific evidence in support

of the vaccine's safety and efficacy, highlighting a lack of scientific consensus as well as attempting to feature the vaccine embedded within political discourse (Saulsberry et al., 2019; Fowler & Gollust, 2015; Gollust et al., 2010; Krakow & Rogers, 2016).

The MMR vaccine, on the other hand, was introduced in 1963 with comparatively little controversy until some 35 years later, in 1998, when the vaccine was hotly debated within the scientific community following an article in the medical journal the *Lancet* suggesting a potential association between autism and the MMR-vaccine (Wakefield et al., 1998). The media have also been accused of keeping this particular controversy in the public spotlight, at odds with the prevailing scientific consensus (Clarke, 2008). By featuring both the perspective of supporters and opponents of such a link in the pursuit of balanced coverage, the media gave the impression that there was plausible doubt and uncertainty of evidence underpinning the rejection of a causal relationship between the vaccine and autism (Clarke, 2008). Recent surveys suggest that this is still a concern for American citizens, as 46 percent of Americans report that they are still “unsure” if the MMR vaccine causes autism according to a recent Gallup survey (2020).

A number of politicians and other celebrities have weighed in on the issue of childhood vaccinations, both liberal and conservative, including then presidential candidate Donald Trump. During a campaign debate he claimed that “just the other day, 2 years old, 2½ years old, a child, a beautiful child went to have the vaccine, and came back, and a week later got a tremendous fever, got very, very sick, now is autistic” (Trump, 2015 in Wolters & Steele, 2018).

It is also hotly debated whether skepticism about the MMR vaccine is more prevalent on the political left or right (Rabinowitz, Latella, Stern & Jost, 2016). Commentators have depicted vaccine opposition as primarily a liberal attribute, comparable to the conservative rejection of climate science, while others argue that the alleged liberal bias against vaccination anecdotal and based on arguments such as celebrity statements (Hamilton, 2015). Public attitudes toward the vaccines are discussed in the following section.

The controversy of the vaccine-autism connection has attracted the attention of many media scholars questioning how the news media cover important public health issues (Dixon & Clarke, 2012; Holton et al., 2012). Others have focused specifically on the media representations of “anti-vaxxers” (Capurro, Greenberg, Dubé & Driedger, 2018). But very few have examined the media coverage during or after the recent measles outbreaks in a US context, although some have focused on the media frames in Canadian coverage of the US measles outbreak (Greenberg et al., 2019).

2.3 Public attitudes toward the vaccines and vaccinations

Vaccines are widely recognized as one of the greatest public health achievements (Dubé et al., 2013). But numerous studies have documented that vaccine-related confidence has been decreasing among US parents (Gowda & Dempsey, 2013; Dubé et al., 2013; Siddiqui et al., 2013).

Despite official recommendations for HPV vaccination, willingness to get their children vaccinated (Calo et al., 2017) and support for school-entry requirements (Calo et al., 2016b) are relatively low. Further, research has found that ideology seems to play a role in the acceptance of the vaccine. Conservatives have found to have lower acceptability of the HPV vaccine than liberal parents (Constantine et al., 2007; Reiter, McRee, Kadis & Brewer, 2011); and conservative individuals are less likely to support vaccine requirements than liberals (Saulsberry et al., 2019).

Ideology also seems to play a role in shaping people's attitudes toward MMR vaccination. Recent research has shown that conservatives express less intent to vaccinate than liberals (Baumgaertner et al., 2018); conservatives are more likely to reject science regarding vaccines (Hamilton, 2015) and they are also more likely to endorse anti-vaccination statements and purport greater disagreement with pro-vaccination statements, than liberals (Rabinowitz et al., 2016). This ideological gap in vaccination attitudes is reflected in a recent Gallup survey (2020) finding an overall decrease in confidence in the importance of the vaccine among conservatives and an increasing partisan gap regarding the importance of vaccinating their children.

3 The complexities of communicating about science

People increasingly face the necessity of integrating science information with their personal values, in order to make important life decisions, such as those about medical care. However, if the information appears to be in conflict with their economic interest, beliefs or values, there is no promise of a smooth integration of scientific recommendation. Scientific findings do not only influence personal considerations, but involve corporate policies, laws and regulations. The high stakes of those decisions attract multiple actors to get involved, pitting competing interests and political control of various players against one another (Lupia, 2013).

Currently, politics seems to dominate the discussion of many scientific issues in the US, including climate change, stem cell research as well as the use of various vaccines (Suhay & Druckman, 2015). Most citizens hear about scientific issues from various online and offline media, a trend that involves both promise and peril (Scheufele, 2014). An important function of news organizations is to pre-select relevant news for citizens to allow them to make informed personal and democratic decisions (Scheufele, 2014). On the other hand, previous research has shown that the amount of coverage – and presentation – depends to some degree of the political and societal controversy surrounding the scientific issue (Nisbet et al., 2003; Nisbet & Huge, 2006). Consequently, the visibility of scientific issues in the media are often leveraged by actors with political interests that differ from those of the academic community. Finally, when scientific advances become politically contested, the media seems to contribute to issue polarization by their preference for dramatic coverage (Nisbet & Markowitz, 2014).

This is the dynamic to which this chapter is dedicated; how the audience's predispositions shape their views of science issues as well as how media praxis and other organized political interests influence the presentation in the news.

3.1 Predispositions shape opinions on science issues

The discrepancy between scientific consensus and public views in general was long assumed to derive from a lack of accurate scientific knowledge among the public (Brossard & Lewenstein, 2010). Yet a growing body of research on the relationship of scientific knowledge

and attitudes toward science have found that this is a much more complex relationship. Rather, a person's values, beliefs and cues from mass media determine how audiences shape their attitudes (National Academies, 2017; Scheufele, 2006). Values can act as a filtering mechanism that explains why and how different audiences respond differently to scientific information (Scheufele, 2013).

In fact, scientific knowledge seems to have a polarizing effect on attitudes in relation to ideology (Nisbet & Markowitz, 2016). In climate change research, studies have suggested that polarization occurs because individuals with higher levels of education and knowledge tend to be more attentive to politically or religiously congenial arguments, more attuned to what others think about the matter, and more likely to react to these cues in ideologically consistent ways (Kahan, Peters, Wittlin, Slovic, Oullette, Braman & Mandel, 2012).

Scholars have suggested that this tendency, relying on ideological values, worldview, and perceptions of trust, rather than scientific knowledge, also applies when individuals formulate opinions toward vaccines and vaccination (Baumgaertner et al., 2018; Kahan, Braman, Cohen, Gastil & Slovic, 2010). Research on public perceptions of vaccination have argued that identity affirmation, information sources and value-based narratives in public discourse matter when an individual's evaluates vaccine information (Song, 2014). In the case of MMR-vaccine, scholars expect that tailored messages will be greatly successful in conveying vaccine-related information to diverse publics (Song, 2014).

For instance, in the context of the swine flu vaccine, studies have proposed that the reasons for greater unwillingness among Republicans to take the vaccine were fourfold, that is: conservatives tend to be more skeptical to government intervention; government intervention was suggested by a Democratic administration; the pro-vaccination message was backed by global institutions to which they tend to be skeptical; and finally, that they exposed themselves to media that gave them ideological cues on how to approach the issue of vaccinating against the swine flu (Baum, 2011).

Some of these theoretical assumptions have been tested in an experimental setting. One study found that Democrats were more willing to take the swine flu vaccine, than were individuals identifying with the Republican Party (Mesch & Schwirian, 2014). The results were considered a consequence of the fundamental tension between cultural values tied to vaccination: the one between the individual's agency and the collective agency of the state and the public health authorities. Further, the scholars claimed that the division was consistent with the reported trend of distrust in science among political conservatives (Gauchat, 2012); and a

consequence of ideological media segmentation that has made willingness to vaccinate a contested political issue (Baum, 2011).

Experimental studies have tested similar theoretical explanations for ideological differences in in MMR vaccination attitudes. The scholars found that ideology had two routes in affecting people's vaccination attitudes on the MMR vaccine: one direct, and one indirect through perceptions of trust in government health experts, such as the CDC (Baumgaertner et al., 2018). Conservatives were found to be less likely to indicate that they would vaccinate against measles, than liberals were (Baumgaertner et al., 2018).

“Cultural cognition” has also been found to shape perceptions of the benefits and risk associated with the HPV vaccine (Kahan et al., 2010: 501). Disagreement about the risks and benefits of HPV vaccination were found to be shaped by cultural values, exerting their influence through biased assimilation – cognitive heuristic by which individual's credit and dismiss information in a manner that confirms their prior beliefs, and through source credibility – information sources whom individuals identify as sharing their worldview were deemed more credible (Kahan et al., 2010). Findings showed that political and social conservatives perceived much higher risk from HPV vaccinations than those who aligned with liberal and progressive political and social values (Kahan et al., 2010). The former was predisposed to reject the benefits of the vaccine because it condones sexual behaviors and defies traditional gender norms and intrudes on individual decision making. The latter was predisposed to see greater benefits due to it signals of tolerance for behavior that denigrates traditional norms and embodies collective commitment to the public good (Kahan et al., 2010). Polarization grew when arguments to which they were disposed to accept were made by policy advocates whose values they shared.

In short, individuals tend to evaluate issues in a way that reflects their membership in social groups such as political party or ideological group and rely on the views of those with similar cultural values, e.g. political representatives (Mesch & Schwirian, 2014). Three of these studies suggest studies suggest that the elite positions and value-based narratives in the media may have made certain considerations more salient than others (Mesch & Schwirian, 2014; Kahan et al., 2010; Baum, 2011).

The concept of *framing* science-related issues combines these mechanisms. It has been suggested that actors that communicate about science should take ideological differences into account to reach better predictions in assessing public opinion and perception across issues (Nisbet & Markowitz, 2014; Song, 2014). Scholars have suggested that actors, such as government health authorities, that take variations of trust across ideologies into account will

be able to better predict the expected success of vaccine campaigns (Baumgaertner et al., 2018). Others confirm that framed narratives confirming the cultural orientations that shape vaccine benefits and risk perceptions will be more effective in influencing vaccination attitudes (Song, 2014).

Frames used to describe science information can serve as very powerful heuristics for audiences that are being faced with risk evaluation or regulatory policies regarding science-related issues (Scheufele, 2013). A well-framed science issue can provide the audiences with the tools for understanding the relevance of science to their everyday life and its societal benefit (Scheufele, 2013; 2014). On the flipside, framing science issues can be exploited for diverse political agendas that create or reinforce cultural divides. Political actors are aware of the persuasiveness of party identification and political ideology and have used it to leverage both candidates and causes (Lupia, 2013). Stakeholder involvement is discussed in the following section and elaborated upon further in the next chapter.

3.2 Political involvement in framing science-related issues

Framing research offers a rich explanation for how various actors define science issues in politically strategic ways, how journalists selectively cover these issues and how diverse publics differently perceive, understand, and participate in these debates (Nisbet & Scheufele, 2009). This section discusses the involvement of political and social actors in framing science-related policy issues in public discourse to mobilize support for their position or perspective. The might be referred to as *issue framing* (Saulsberry et al., 2019).

In the context of the stem cell debate, scholars have argued that two contending frames set the context for public judgments and opinions by selectively activating different cognitive schemas (Nisbet & Markowitz, 2014). Officials and interest groups conveyed specific frames of reference of why stem cell research mattered and what was at stake for society. Experimental tests showed that subjects' opinions on the issue were in part a function of the selective frames and storylines found in news coverage. Republicans aligned with the cues of Republican leaders in opposition of expanding stem cell research and the narrative of moral travesty framing of destroying embryos, and Democrats responded to the Democratic advocacy cues from Democratic leaders and the narrative of moral duty to move forward with research that could benefit Americans (Nisbet & Markowitz, 2014).

The issue of climate change has historically been framed in ways that reinforce ideological divisions, by emphasizing uncertainty and appealing explicitly to conservative values, by use of frames such as *scientific uncertainty* and *unfair economic burden* to the US due to climate change, in order to defeat the adoption of the Kyoto treaty and other major policy proposals that ran counter to Republican economic interests (Nisbet & Scheufele, 2009). Democrats countered by emphasizing the *public accountability* frame claiming that politics were put ahead of science in a number of issues, including climate change, which mobilized many ideologically like-minded Democrats (Nisbet & Scheufele, 2009).

The concept *politicization of science* has been used to explain; how politically interested individuals or groups manipulate the presentation of science, by selectively citing evidence that supports their agenda (Bolsen, Druckman & Cook, 2014a); that actors emphasize the inherent uncertainty of science to cast doubt on the existence of scientific consensus (Bolsen & Druckman, 2015); and that the science underlying policy decisions is increasingly being subjected to promotion and attack by advocates and opponents of regulatory policies (McCright & Dunlap, 2011). These processes have mainly been studied in the context of climate change (McCright & Dunlap, 2011) and tested in studies regarding support for nuclear power (Bolsen et al., 2014).

Beyond the context of climate change, more specifically the context of HPV vaccination, the term *politicization* is more commonly used. Politicization in this context encompass; a recognized political actor offers a conflicting viewpoint on a health issue (Fowler & Gollust, 2015) and political and social actors expressing explicit pro or con position regarding policy action and its implications (Fowler et al., 2012; Gollust, Attanasio, Dempsey, Benson & Fowler, 2013; Fowler & Gollust, 2015). The term has also been used explicitly to explain the news media's role in making arguments and positions more salient in media coverage (Fowler et al., 2012; Fowler & Gollust, 2015; Gollust et al., 2016). Some suggest that when issue frames compete with each other in public debate and the media emphasizes these competing views, the issue has been *politicized* in the news media (Fowler & Gollust, 2015). Essentially, it taps into the incentives of political actors to get involved in health controversies because their constituents care about the issues and the media's preference for seeking out the competing sides of an issue (Fowler & Gollust, 2015).

The interplay between various strategic actors and the media is expanded upon in the following section.

3.3 The interplay of the media and stakeholders

The general idea behind the concepts of media logic and political logic is that media and politics constitute two different institutional systems serving different purposes, with their own set of rules, procedures, needs and interests (Esser & Strömbäck, 2014). For instance, the processes of defining problems, negotiating, gathering support and implementing policies shape the political logic. The need to successfully achieve publicity, gather support of public opinion, and influence decisions, requires actors to engage in the processes of defining and framing issues (Esser & Strömbäck, 2014). Conversely, media logic influences the culture of news production (Esser & Strömbäck, 2014). Shared understandings among journalists of independence; standards of newsworthiness that shape what selection and format include timeliness, proximity, surprise, negativity, elite involvement, conflict and personalization; and the role of serving the public interest – all shape media logic (Esser & Strömbäck, 2014). In short, media logic refers to the processes that shape and frame media content (Mazzoleni, 2008 in Esser & Strömbäck, 2014).

Mediatization refers to the process of media becoming increasingly influential and deeply integrated into different spheres in society (Esser & Strömbäck, 2014). Mediatization of politics refers to the degree to which the media; constitute the most important source of information about politics and society; have become independent from other political and social institutions; media content and the coverage of politics and current affairs is guided by media logic or political logic, and the degree to which; political institutions, organizations and actors are guided by media logic or political logic (Esser & Strömbäck, 2014).

The degree of mediatization is contextual and an ultimately an empirical question, but the studies discussed below speak to the power of media in defining, symbolizing and resolving policy issues related to science controversies (Nisbet et al., 2003). Further, as a testament to the importance of the media in shaping the public debate, numerous scholars have urged scientists to strategically frame their communication to fit diverse publics and the workings of the media (Nisbet, 2009; Scheufele, 2013; Nisbet & Markowitz, 2016) and to understand and anticipate the framing cycle (Scheufele, 2014).

Moreover, in recognizing the importance of media coverage in influencing policy outcomes, *various* actors try to influence the media to shape the attention and emphasis of coverage that marshal support for their positions (Nisbet et al., 2003). Consider the conservative religious group promoting the sexual morality arguments in the HPV vaccine debate for

instance (Colgrove et al., 2010). Research has shown that when the HPV vaccine emerged, journalists relied on this group to provide a moral counter-argument to this new technology (Fowler et al., 2012).

3.3.1 The policy cycle and the framing cycle

Research tracking the evolution of the stem cell debate in the media has demonstrated that the potential for dramatic framing corresponds with the cycle of policy development (Nisbet et al., 2003). The study found that the administrative policy arena tends to privilege expert voices of the scientific community. When an issue enters into the overtly political arenas, the scientific community tends to hold less influence as the issue is opened up for interest group involvement. When debates are held in the context of overtly political institutions, they receive considerably more media and public attention. The media attention was also linked to the media's framing and the potential for dramatic coverage of the arenas. Meaning that when the debate was held in administrative contexts, media attention was low, and the most prominent frames were *scientific research* and *scientific background* with very few *strategy/conflict* or *ethics/morality* frames. When the debate entered the political arena, media attention spiked and the prominence of science frames decreased considerably, to be replaced by a dramatic emphasis on *strategy/conflict* and *ethics/morality* framing appearing in almost every article. This study confirms the journalistic need for a narrative structure, also when covering science-related issues (Nisbet et al., 2003).

Other content analyses combined and separately have examined the evolution of media coverage of the HPV vaccine (Fowler et al., 2012; Fowler & Gollust, 2015). In the early stages following the approval of the vaccine, news coverage of the HPV vaccine was found to lack information about the virus and vaccine; was most frequently framed as a cancer prevention vaccine; and governmental officials, medical sources and the CDC were the most commonly cited sources (Quintero Johnson, Sionean & Scott, 2011). During the phase of state debates over vaccination laws, media coverage shifted from promoting essentially one side of a health news event with the key message of being a cancer, to more competitive coverage with distinct arguments and information sources presenting positions for and against requiring the vaccine (Fowler et al., 2012).

The framing cycle refers to the different periods of stakeholder competition in interpretation of an issue, first the emergence of an issue; then conflict over problem definition; resonance (where one side prevails and the other adjust); and the resolution phase (where one

side dominates and policy action follows) (Fowler et al., 2012). A study focused specifically on the emergence phase and problem definition phase of the framing cycle, demonstrated that the media discussion did not start out as controversial, but as legislative discussion began, there was a large increase in controversial framing, defined as actors expressing explicit pro or con positions regarding state requirements related to the HPV vaccine (Fowler et al., 2012). News articles frequently described doctors, politicians, parents and interest groups as conflicted over mandatory HPV vaccination. More importantly, conflicts were depicted in the context of moral and political arguments both in opposition and in favor (Fowler et al., 2012). Another study supports the notion that health perspectives became less in focus during the phase of active states debates, reporting that a considerable proportion of articles did not mention health related information (Quintero Johnson et al., 2011).

Research tracking the emergence and prevalence of politically-oriented news coverage, did so by examining the extent to which articles mentioned; a political source that endorsed or highlighted political conflict; a political context; or conflict or controversy within a political dimension such as government action or partisan divides (Fowler & Gollust, 2015). Articles that mentioned controversy over state action; the position of an identified political actor source; and a political argument (e.g., whether government, science, or parents should have the authority to guide vaccination policy), all increased across the country during the time of active state debates (Fowler & Gollust, 2015). The political elements of coverage receded after the state debates, but coverage was more likely to contain political elements after the resolution phase and did not return to the lowest level identified before legislative debates. This led the authors to hypothesize that when an issue has achieved political valence, political elements will thereafter be a part of media coverage (Fowler & Gollust, 2015). This suggestion was supported by subsequent analyses (Gollust et al., 2016; Krakow & Rogers, 2016).

The most recent phase in the public agenda to achieve scholarly attention was when HPV vaccine was licensed for boys (Gollust et al., 2016). One study examining this period, found that almost half of the news articles in 2011 were political stories about the HPV vaccine, focusing mainly political events (Krakow & Rogers, 2016). Additionally, stories without a political focus tended to contain more detailed health information than political stories. It was concluded that the focus on political events eclipsed coverage of the HPV vaccine recommendation during that year. More importantly, this heightened attention of concerns about sexual morality, vaccine costs, safety and side effects, and legal mandates as a barrier to parental rights (Krakow & Rogers, 2016).

This is, to the best of the authors knowledge and supported by research overviews (Gollust et al., 2016) the latest content study of the HPV vaccine. The present study will examine a sample of media coverage of the HPV vaccine, in the years following this most recent content study.

3.3.2 The MMR vaccine

As aforementioned, most studies have examined the MMR vaccine in the context of the fraudulent claims of the vaccine leading to autism. Nonetheless, the following media content studies demonstrate how the media tend to report on the vaccine.

A content study on the autism-vaccine controversy, examined a sample of UK and US newspaper articles on the issue, and found that 58 % mentioned both supportive and rejecting claims of such a link (Clarke, 2008). It demonstrated the media preoccupation with a balanced reporting to a fault, namely, creating a false balance between a scientific perspective supported by an overwhelming amount of evidence alongside other perspectives with less or no support and context is excluded. A false balance that may give the erroneous impression of scientific uncertainty about the evidence of a scientific issue (Dixon & Clarke, 2012). Researchers argued that under such conditions the media can produce a discourse that differs from the prevailing scientific viewpoint, which in this case rejects a causal relationship between autism and the vaccine (Boykoff & Boykoff, 2004; Clarke, 2008).

Another content analysis on the autism controversy operationalizes the concept of a media frame as a distinct *blame frame*, focusing on whom was attributed blame in each news article, which source to attribute responsibility to and what might be done about it (Fowler et al., 2012). This is not entirely different from the operationalization of frames used in the empirical analysis of the present study, as will be elaborated upon in the chapter on method. The findings showed that the author of the fraudulent study claiming an association between autism and the vaccine was most often blamed in the media. The authors cautioned that this type of framing guides the public to consider one individual as the main source of blame for a problem that is much more complex systemic issue (Fowler et al., 2012).

In all, media coverage of science-related issues has the potential to create a disconnect between scientific realities and subjective perceptions of citizens, as well as make political considerations more salient. This tendency can be attributed to media practices more broadly. A shrinking number of science journalists are giving way to political journalists, general assignment reporters and opinion writers who do not regularly communicate about science

(National Academies, 2017). Strategy and conflict frames are more likely to be political journalists and editorials than specialist journalists (in science and business beats) (Nisbet & Hoge, 2006).

The frames in the media are not without potential consequences (Gollust, Dempsey, Lantz, Ubel, Fowler, 2010; Fowler & Gollust, 2015). Although the present study does not test media effects, it is important to acknowledge the power of media discourse in shaping attitudes.

3.3.3 The effects of media frames

It seems science-related issues are not immune to the media preference for framing issues in terms of strategy, conflict and morality, and focusing on political events rather than providing health information (Nisbet et al., 2003; Fowler et al., 2012; Krakow & Rogers, 2016). The question to which this section turns is what implications media discourse and frames have on public perceptions and attitudes.

In an experimental study, subjects were exposed either to a *controversy* frame, which presented medical and political conflict on proposed HPV vaccine legislation, or a *uniform support* frame that stated that politicians and medical experts were in support of the legislation (Gollust et al., 2010). Results showed that those exposed to the conflict framing were less likely to support legislation. They did not distinguish between the effects of political and medical conflict, but a subsequent experimental study filled this gap in part.

This was followed by an experiment tested two other conflict frames (1) politicians divided over the issue, and doctors in uniform support over vaccine requirements, and (2) politicians in uniform support and doctors divided. The political conflict condition decreased support for HPV vaccine requirements and immunization programs, but the effect did not hold in the robustness test. But both pre-exposure and experimental exposure to political conflict decreased trust in doctors (Fowler & Gollust, 2015).

The scholars argued that when political cues and symbols become integrated into public presentation of health issues it will lead audiences to interpret them heuristically through a partisan perspective (Fowler & Gollust, 2015). The intention and results are somewhat mismatched, since the authors did not test these predictors separately.

Yet another experiment examined how the specific ideological component of the controversy surrounding the vaccine affected individuals' perceptions of legislation and immunization programs in relation to media exposure (Gollust et al., 2013). Controversy was defined as conflicts and disagreement among politicians and medical experts, and the

prevalence of competing messages from both liberal and conservative advocacy groups presenting their side's policy prescriptions and implications (Gollust et al., 2013). The authors hypothesized that a high volume of ideological cues in the news media would translate to different perceptions of the vaccine as evidenced by others (Constantine & Jerman, 2007) and subsequently affect the awareness of the vaccine when exposed to competing sides in the media.

Findings showed that liberals were most sensitive to media exposure to the vaccine debates, and as exposure increased, liberals became more aware, whereas conservatives' awareness was constant and did not vary with increased news exposure. The explanation for this is that opposition to HPV vaccine mandates were justified with ideologically based arguments, including concerns about sexuality and the general resistance to governmental intrusion on parental autonomy (Gollust et al, 2013; Colgrove et al., 2010). In general, it prompts conservatives not to select such media. If exposed, conservatives would resist the message that HPV vaccination mandates are necessitated by means of biased assimilation, by counterarguing the premise or selectively incorporating some aspects (the conservative line) and forgetting others (the liberal stance). These results are in line with research that shows how self-selecting media based on ideology leads to differences in vaccination behaviors regarding the swine flu vaccine (Baum, 2011).

Another study examined partisan differences in attitudes about the swine flu and to what extent differences in ideological media consumption could account for the attitude differences (Baum, 2011). Not in an experimental setting but based on an examination of different survey data sets, findings showed correlations between Republicans relying on Fox News in particular for news about the swine flu and less concerned about the flu, compared to their counterparts relying on traditional news sources, or Democrats regardless of news source. The author hypothesized that this would also affect immunization rates (Baum, 2011). The regression analysis indicated that states with more conservative newspapers had lower immunization rates, after accounting for alternative explanations. This pattern, it was suggested, could have implications for public policy and public health, if it leads partisans to refrain from vaccinating (Baum, 2011).

Similar patterns have been examined in the context of climate change (Feldman, Hart & Milosevic, 2017). Content analyses show that media with a conservative audience were less likely to frame the issue in terms that promote engagement and more likely to frame in terms of conflict, compared to media with a liberal following. The authors concluded that such differences might exacerbate ideological polarization on climate change (Feldman et al., 2017).

Effects studies have confirmed that greater use of conservative outlets was associated with lower levels of certainty that global warming is happening, while greater use of non-conservative news was associated with greater levels of certainty (Hmielowski, Feldman, Myers, Leiserowitz, & Maibach, 2014). A longitudinal measure was included to strengthen the evidence of causal influence of media influence upon climate change beliefs, showing that frequent use of conservative media was negatively associated with certainty of global warming. This was believed to be a consequence of media outlets framing scientists and scientific issues in a way that makes certain values salient, for example, by amplifying climate skeptic claims. It has even been argued that a coordinated denial movement uses conservative media as a means for casting doubt on the science of climate change, especially among ideologically receptive audiences (Hmielowski et al., 2014).

The present study does not attend to these connections specifically, but these studies demonstrates that the frames in – and the self-selection of – media outlets have consequences for public opinion (Baum, 2011).

3.4 Summary and discussion

As this background indicates the context of communicating about science is very complex. Many dimensions relating to media practices, changing circumstances in the media environment, audience characteristics, and political interests and needs, contribute to the politicized milieu of communicating about science. Politicized environments are defined as the setting where decisions on divisive public issues are made and political actors can promote their interpretation of an issue (Lupia, 2013).

This in turn, makes it difficult to evaluate the studies separately – what one study may lack, another one examines. As with this much of this literature, the present study only examines a particular area of study: frames in media coverage. But does so against the accumulated knowledge of this diverse research field. And because it uses an inductive approach to the empirical material, it rests heavily on insights from previous literature. This will explain the emphasis on accentuating findings from previous research, rather than dissecting the vast and dynamic processes.

A short summary of the background follows. Individuals engage in biased information processing when forming opinions (Scheufele, 2013). This mechanism makes individuals

susceptible to narratives that resonate with their cultural world view. Political actors (e.g. political entrepreneurs, interest groups, politicians) can strategically frame issues around dimensions that feed on the biases of constituents, news producers and their respective audiences (Nisbet et al., 2003; Nisbet and Huye, 2006). News producers tend to further the interpretive narratives of political actors, seek out competing views on issues and apply conflict framing to science-related topics (Fowler et al, 2012; Fowler & Gollust, 2015). This in turn, can lead audiences to interpret them heuristically through a political or ideological perspective and make them less attentive to the view that they are predisposed to dismiss (Gollust et al., 2013; Druckman, Peterson & Slothuus, 2013; Kahan et al., 2010). Finally, the self-selection of media and content of these outlets can fuel polarization by emphasizing certain political perspectives (Baum, 2011; Feldman et al., 2017).

What binds these mechanisms together is the importance of framing. Framing is expected to provide individuals with the means for a better understanding of the relevance of science issues personally and in policy decisions (Scheufele, 2014). Issue framing and value-based narrative has been used by various political and social actors aiming to mobilize support for their cause or interpretation (Nisbet & Scheufele, 2009; Colgrove et al., 2010). Finally, the media tend to rely on these narrative and/or apply their own frames to issues. The analytical approach to the media discourse is framing theory, explicated in the following chapter.

4 Framing vaccines in the media

The analytical approach is guided by a comprehensive understanding of framing theory that encompasses frame building, framing cycles and is complemented by insights from the field of science communication. A discussion regarding the analytical approach will follow in this chapter, including its limitations and potential in uncovering the frames in media coverage.

4.1 Framing theory

The term framing dates back decades within the research fields of sociology and psychology and assumes that all human perception is dependent on frames of reference that can be established by presenting information in a particular way (Scheufele, 2013). Conceptually, frames are interpretive storylines that communicate what is at stake in societal debate and why it matters (Gamson & Modigliani, 1989). The main premise of framing theory is that because an issue can be viewed from a variety of perspectives, the particular presentation may have implications for individuals' considerations (Chong & Druckman, 2007). Frames are typically used to cast information in a certain light and emphasize different aspects to influence what people think, believe or do (National Academies, 2017).

Frames have been located within audience members (individual frames), news organizations, news sources, news texts and within the culture in which news is constructed (D'Angelo & Kuypers, 2010). In communications studies frames refer not only to media frames, but politicians' frames, audience frames and frames of interest groups (Chong & Druckman, 2007). The present study is primarily concerned with examining the frames in the media, that is, the *content features* of media coverage. While also acknowledging that frames are the outcomes of the power struggle over meaning between actors with different material and symbolic resources (Vliegenthart & van Zoonen, 2011). Framing theory provides the tools to explore what frames are featured in the news coverage and the means to discuss what implications it may have for public discourse.

4.1.1 Defining frames

Communications scholar Robert Entman (1993: 52) puts forth *selection* and *salience* as guiding principles in the definition of framing which reads that “to frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described.” The process of selection entails choosing to convey some aspects of reality while obscuring others, which might lead the audience to different and/or a delimited understanding of an issue. This part of the definition aligns with the idea expressed by sociologists of the 1970’s putting forth that news is *socially constructed*. In fact, insights from as early as the 1920s highlight that the media do not simply mirror reality but make their own selections, and that news in itself presents a window on the world and by consequence that its frame delineates the world (Lippman, [1922]1997; Goffman, 1974; Tuchman, 1978).

Scholars argue that understanding the routines and values of news work will help explain how certain frames are selected over others (Reese, 2010). Factors such as time, space, money, and competence impact the way that news is selected and later processed (Tuchman, 1978). Newsworthiness is a type of selection criterion. News organizations must consider what the audience wants and what news is believed to interest the audience (Johansson, 2008). More importantly, organizations consider which news the audiences ought to take part of and what the audience ought *not* to acknowledge (Johansson, 2008). Against this background, the media cannot be expected to function as transmitters of science-related issues that are ‘true to reality’ (Weingart, 1998).

Salience refers to making a piece of information more noticeable, meaningful and memorable to the audiences (Entman, 1993). Saliency is not necessarily equated to frequency in a news text, although repetition is one way of making a piece of information more salient along with placement, or association to culturally familiar symbols.

So, *to frame* is to “select some aspects of a perceived reality and make them more salient in a communicating text” and frames then “define problems; diagnose causes; make moral judgements; and suggest remedies” (Entman, 1993: 53). The definition is used here as an organizing principle with its corresponding *frame elements*: problem definition, causal attribution, moral evaluation, and treatment recommendation. Based on subsequent commentaries of this original work (Van Gorp, 2010; Matthes & Kohring, 2008; Scheufele & Scheufele, 2010) a more comprehensive conceptualization of framing is needed in order to understand how framing of an issue relates to the power struggle over meaning. This is the point to which the next section is dedicated.

4.1.2 A comprehensive understanding of framing

Frames do not have a single definition that is agreed upon and operationalized consistently by scholars (Lecheler & de Vreese 2019; Vliegthart & van Zoonen, 2011). Entman's definition is an attempt at concentrating the accumulated knowledge of the field into an operational definition of framing and frames and the widely acknowledged definition has since become a standard reference in much framing research. Still, review articles have found that these articles contain countless diverging operationalizations of the concept (Vliegthart & Van Zoonen, 2011). Scholars have cautioned that the dispersion of framing studies may leave room for too great a deal of leeway in theorizing about the mechanisms and processes of news framing (D'Angelo & Kuypers, 2010). On the other hand, it may very well be the case that the field is still developing its "core knowledge," which would explain the many operationalizations of the concept (Entman, 1993: 51). It does not follow automatically that Entman's proposed definition is the most accurate, even though it is based on gathered insights from the field at that particular point in time.

Some have argued that there is not, nor should there be, a single paradigm of framing (D'Angelo, 2002). Rather, knowledge about framing has accumulated because researchers have sought to employ and refine many of the theories on the relationship between frames and framing effects. According to this perspective, theoretical diversity is encouraged as a means to gain a more comprehensive view of the framing process (D'Angelo, 2002). This study will therefore use Entman's definition as a means for uncovering frames while complementing it with valuable insights from subsequent framing studies of how frames end up in the news.

For example, Entman only briefly touches upon how the concept might be applied in a content analysis of news texts, which is the chosen method for this study, demonstrating the need for additional foundational blocks in the theoretical and methodological framework. Methodological considerations and operationalization of the definition will follow in the next chapter concerning method. It will become clear here and in the next chapter that Entman's definition functions as the organizing principle for uncovering the frames. The corresponding frame elements are means to systematically approach the data, while the elaboration of the theoretical understanding of framing which will follow, offers a broader base for discussing the role framing in defining societal issues.

4.1.3 Framing as a struggle and a science communications necessity

In broadening the theoretical framework on framing, we must consider some valuable insights from frame building literature, framing cycles, value-based science communications efforts.

Frame building is concerned with how media frames are formed by taking into account the processes that influence the creation or change of a frame featured in news coverage (Scheufele, 1999). Processes that influence how a frame ends up in the news coverage include organizational and structural factors of the media system such as ideological leanings of the news organization, but also market constraints, differences in power of social and political sources, or other national and international cultures and structures (Vliegenthart & van Zoonen, 2011). For example, due to organizational budget cuts science issues are increasingly being covered by political reporters that are more likely to frame scientific issues in a political manner (Nisbet & Fahy, 2015).

However, the focus on the agency of the journalist overshadows the fact that journalists tend to adopt the frames of their sources (Tuchman, 1978) especially with regard to unfamiliar and unexpected topics (Van Gorp, 2005). For example, political elites are commonly featured sources which tend to aim appeal to the partisan and ideological leanings of their constituents, providing frames which journalists can in turn rely on in their coverage. As a consequence, news organizations are believed to limit the range of information about a topic because journalists (as a result of the workings of the organization) judge that there are few credible sponsors (i.e. sources) about a topic (D'Angelo, 2002). This is not to say that journalists cannot neglect or negotiate the frames and reframe issues (de Vreese, 2010).

A variety of stakeholders compete for access to the news agenda and work hard to ensure that the issue is framed in the way they want (Nisbet & Huge, 2006). These entrepreneurs (e.g. interest groups, advocacy groups, activists) invest time and resources to create and redefine the issue at stake, by combining and applying ideas from other issue domains in order to make their message resonate with the values and beliefs of a target group (Fowler et al., 2012).

Vaccinations also include a range of values upon which various actors can rally, such as individual agency, government intrusion, parental liberties, private sector interests (Big Pharma), and doubts about western medicine (New Age beliefs) (Song, 2014; Hamilton, 2015). These interests may only apply to a minority of people, as did climate skepticism at first and concerns about teen sex regarding HPV vaccinations. But as research has demonstrated these interests can gain significant media coverage and shape the discussion on vaccinations.

As mentioned, entrepreneurial action can propel frames into media coverage. This is demonstrated in studies of the media coverage of the HPV vaccine, which show that publicizing the political and moral views of the vaccine's opponents framed the vaccine debate in terms of

sexual morality. The stem cell debate was also cast in terms of morality following the issue framing of religious groups gaining significant news coverage (Nisbet et al., 2003; Nisbet & Markowitz, 2014). In the context of climate change, pro-business values and conservatives think tanks framed and launched the idea of climate change skepticism. This strategy led to further distortions in news coverage, as journalists applied conflict framing and falsely balancing competing claims (Boykoff & Boykoff, 2004).

Scientists are also encouraged to frame science in ways that address an indented audiences' values, interests and worldviews (Nisbet, 2009). In the communication of science framing is considered to be “an unavoidable reality” (Nisbet & Scheufele, 2009: 1771), a necessity that stems from inherent differences in scientific discourse and public debate. Frames in science communication can bridge this gap and make information more accessible for non-expert publics in their decision-making processes (Scheufele, 2013). This raises normative questions about the role of the role of scientists in communicating science. In this context however, scientists are considered as non-political actors. Strategic framing efforts of scientists are understood as effective public engagement efforts that can circumvent polarization and unite various publics around common ground and must be tailored to fit the constraints of a diversity of media outlets (Nisbet, 2009). If so, science actors can establish themselves as one among a range of different perspectives that the media coverage can choose between, while leaving no promises of media attention.

Some research has shown that coverage of science-related issues has favored government, industry and scientists' interest or issue frames (Nisbet et al., 2003). When science-related issues are not in an overtly political stage (e.g. policy making), scientists are generally the recognized authorities on the causes, consequences and solutions pertaining to an issue (Nisbet & Huge, 2006). However, this pattern shifts in times of political contention as demonstrated in framing cycle research. The debate over stem cell research mobilized a wide range of religious pro-life interests which then rose to the top of the political and media agenda. In politically contested environments dramatic arguments based on ethics and social concern are often emphasized in media coverage (Nisbet et al., 2003).

During the time of examination of these issues, only one state enacted legislation (NSCL, 2018) and one scientific event occurred when the FDA approved the vaccine for adults through the age of 45 in 2018 (FDA, 2018). Compare this to legislation pertaining to the MMR vaccine, by which three states in the year of 2019 alone enacted legislation (NSCL, 2020). According to the reasoning of previous studies (Nisbet et al., 2003; Nisbet & Huge, 2006) taking the whole of the periods into account, the two vaccines were generally and relatively in different

stages in the policy cycle during these different periods of time, which might affect the media's framing. Differences in media attention regarding these issues is demonstrated in the next chapter.

The present report cannot determine the origins of the frames in media coverage. Strict frame building or framing cycle studies are perhaps more fitting for such purposes, as they tend to look more chronologically at the development and evolution of frames. The insights from these framing paradigms regarding organizational and structural pressures and framing contest are not lost on the present study, however. Examining the outcomes of such power struggles, i.e. the media frames, will at least give an indication of what interests are invested in shaping the debate and which are put forth in the media. Further, the present study will provide theoretical insight to what interests are generally emphasized during these different periods. The generalizability of such conclusions will, however, be methodologically constrained. This is to be discussed in the next chapter.

To understand the implications of media framing in shaping public discourse, we must consider media framing as a product of these power struggles. Framing involves the interaction of media makers and their sources as well as other organized interests in the public arena – all drawing on social, cultural, ideological or political values in one way or another.

4.1.4 Overlaps in news framing and stakeholder framing

Evidently, there are alternative ways of defining issues within the social and political world. News framing implies that issues and events are presented to citizens as alternative characterizations of a course of action (de Vreese, 2010). For this reason, emphasis frames focus on qualitatively different yet potentially relevant considerations of an issue, by emphasizing different aspects (Chong & Druckman, 2007). For example, when thinking about vaccines, citizens could be presented with a range of perspectives including a cultural, moral, political, scientific, or economic perspective. Such frames are parts of political arguments, journalistic norms and public discourse, endogenous to the political and social world. Emphasis frames are thus more realistic and closer to the practice of news framing, frequently used by both political and media actors to present political reality (de Vreese, 2010).

News framing studies might also benefit from a general distinction with reference to the nature and content of a news frame, distinguishing between *issue specific* frames and *generic* frames. Issue specific frames pertain to specific issues or news events and generic frames are applicable to a range of different news topics (de Vreese, 2010). The frame *Clinton*

behavior scandal is clearly specific to the issue of the final stages of the Clinton presidency, while frames of *conflict*, *strategy*, *human interest*, *economic consequences*, *morality* and *responsibility* are applicable to different issues and events (de Vreese, 2010; Semetko & Valkenburg, 2000).

Considering the inductive approach of this study, one cannot beforehand assume what type of frames might be discovered in the empirical study. The methodological approach in itself may, however, limit the study's ability of making claims about generic frames. Linking a frame explicitly to an issue and evaluation obviates the need to specify how general a frame must be in order to be classified as generic (Chong & Druckman, 2007). For example, the economic frame is considered a generic frame (Semetko & Valkenburg, 2000) but it also serves as a specific issue frame for welfare reform in other studies (Shen & Edwards, 2005). That said, claiming frames as issue-specific limits the opportunities for generalization and comparison (Vliegthart & van Zoonen, 2011). It risks turning frames into content-analytical features in the detailed account of a single case.

There is perhaps a compromise position here that gives weight to the potential generalizability of issue-specific frames and testifies to the overlaps in news framing and other actors framing of science debates.

In the context of science policy debates, scholars have identified frames pertaining to economic investment, market benefits or risks, and local, national or global competitiveness as the 'economic frame' (Nisbet, 2010). This frame along with others such as *morality frames*, *scientific uncertainty* and *conflict frames* are defined by their latent interpretations of different types of framing devices such as catchphrases, metaphor and so on. But because these frames appear consistently in science policy debates, they are considered *generalizable* enough for a typology across science policy debates (Nisbet, 2009). In this way it gives weight to the idea that even though issues are may be studied in specific settings, they may still add to the cumulativeness of the field or across fields. They are also comparable to the generic news frames discussed above, involving conflict, economic consequences, morality etc., which have also been claimed to be applicable to many different issues (Semetko & Valkenburg, 2000). In this sense, it seems frames in science-related debates are not much different than news framing of other issues.

These arenas of framing overlap in their tendency for conflict and morality framing. As mentioned earlier, stakeholder's morality framing is likely to be woven into media discourse (Fowler & Gollust, 2015; Nisbet & Markowitz, 2014). And when science debates spark controversy the media is likely to cast the issue in terms of conflict. The media's preference for

conflict framing has been widely documented. Simply alerting media consumers to the fact that there are two sides to a debate and clarifying which political values and identities are associated with which side, tend to encourage motivated cognition in the public (Suhay, 2017; Fowler & Gollust, 2015). Others argue that while conflict and threat are basic criteria for newsworthiness, news selection is to some extent motivated by a balance of positive and negative news (Briggs & Hallin, 2016). A review of network coverage reveals some of the most common frames or storylines, as the authors call it, were *triumph of medical science* and *heroism of patients*, although the most common was *real or potential health risk* (Briggs & Hallin, 2016).

While these frames do not guide the analysis of the material, they provide some indication to what might be expected as a result of power struggles and general media praxis. It lies outside the scope of this study to determine how general the news frames in the empirical study may be. Just as it cannot with certainty determine if a frame is the result of organizational pressures or a by the journalist applied frame without interviewing them. Any reference to generic frames will be theoretical, yet valuable in a theoretical sense. Strictly methodologically speaking, the present study might reasonably aim to uncover issue-specific media frames.

The overlaps in how science debates tend to be framed and how news media tend to frame issue testifies to the notion that all actors draw upon the same parameters for getting messages across to the public. However, frames in the news are ultimately the outcomes of how influential actors frame issues, how journalists and news organizations adapt and renegotiate the issue following the logic of the news genre (de Vreese, 2010).

4.2 Summary

Scholars caution that all-encompassing definitions of framing might stretch the concept in ways that risk weakening its potential analytical strength (Vliegenthart & van Zoonen, 2011). While others put forth that studies of frames would benefit from the knowledge of the foundational theories of early framing research emphasizing the structural and organizational factors of news work and power relations. The additional insights work to accentuate that news is socially constructed, resonating with Entman's understanding that some aspects of reality are selected and highlighted, and others omitted. It also enhances the understanding of the mechanisms affecting how these 'selections' are made by putting forth that frames are part of a "struggle for meaning between different actors that have unequal material and symbolic resources," and that

frames are “the result of situated social and routinized processes” (Vliegenthart & van Zoonen, 2011: 105).

Pertaining to the particular case of science-related issues in the media, science communications research offers a rich explanation of how various actors try to define science-related issues in strategic ways, political, moral or in terms of public engagement. These insights also highlight the media role in ultimately defining and shaping the discourse of such issues. Seeing as the news organizations have the discretion over what they select and how they define issues by making some considerations more salient, the next chapter turns to Entman’s definition as the guiding principle for uncovering media frames.

5 Methodology

This section accounts for the bridge between framing theory and the way of operationalizing it by means of qualitative content analysis. Advantages and limitations of the chosen method are discussed.

5.1 Qualitative content analysis

It has been argued that there perhaps two types of relevant framing studies, one that examines the development, prevalence or frequency of frames in real-world news coverage, and the other that examines the effect of frames on citizen attitudes, beliefs, or behaviors (Fowler et al., 2012). The present report joins the former league of studies examining frames in news coverage and does so by means of content analysis.

Content analyses lend themselves readily to researchers aiming to reveal and understand what type of media content is actually offered to media consumers. Typically, the field distinguishes between quantitative and qualitative content analyses. Quantitative content analysis is an approach to the analysis of texts that seeks to quantify content often in terms of predetermined categories, and in a systematic and replicable manner (Bryman, 2014). Qualitative content analysis does not aim to quantify but generally allows for categories or themes to emerge from the data, by a so-called inductive approach to the data. The latter will facilitate the analysis in the uncovering of frames in the news coverage.

This approach goes beyond merely counting words to examine and categorize communication into categories that represent similar meanings of either explicit (manifest) or inferred (latent) communication (Hsieh & Shannon, 2005). These categories represent the frames in the coverage and the operationalization of uncovering a frame is discussed more in detail in the next section. It should be noted that this can still be done in a systematic way (Hsieh & Shannon, 2005), a point that will be attended to in the section on operationalization.

The main advantage of using inductive qualitative content analysis is gaining direct information about the world without imposing predefined categories upon the social world. The value of conducting qualitative research lie in observing the social world as it is, with little prior contamination of the object of study (Bryman, 2014). The main disadvantage is that replication of qualitative findings is hard to conduct since the interpretation will be influenced by the

subjective leanings of the researcher. Despite these limitations, the present report values the flexibility of the approach by which unexpected and potentially substantial factors may be exposed. In sum, inductive approaches to detect news frames often produce rich knowledge, but are hard to replicate, which may in turn affect academic cumulativeness (Lecheler & de Vreese, 2019).

5.2 Operationalizing frames

As aforementioned, there has been substantial conceptual confusion about the concepts adhering to the field of framing (Vliegenthart & van Zoonen, 2011). Although they may be theoretically intriguing, most frame definitions are vague and difficult to translate into an applicable operationalization of media frames (Matthes & Kohring, 2008). However, the definition as offered by Entman (1993), has been operationalized successfully in both quantitative (Matthes & Kohring, 2008; Kensicki, 2004) and qualitative research (Van Gorp, 2007; 2010). Insights from both approaches will inform the methodological approach of the present study.

5.2.1 Frame elements and discursive framing devices

According to Entman's (1993: 52) definition, frames increase the salience of particular aspects of a story by promoting a specific problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described. This definition is considered by scholars to provide operational guidelines for uncovering frames (Matthes, 2008). These four functions of the definition have been referred to as "frame elements" by some (Matthes & Kohring, 2008) and "reasoning devices" by others (Van Gorp, 2010: 94). These four functions have also been operationalized by using related questions (Kensicki, 2004). In all, these are understood as the defining elements of a frame, that form a route of causal reasoning and promote a particular perspective (Matthes & Kohring, 2008; Van Gorp, 2007; Scheufele & Scheufele, 2010).

Qualitative researchers (Van Gorp, 2007) have not gone into depth about how these reasoning devices might be expressed, more than to claim that they may be both explicit and implicit statements, or how they might be operationalized when the article is the unit of analysis (Van Gorp, 2010). In quantitative research, scholars have gone more into detail regarding what

these frame elements, as they call them, might entail. The four defining functions in the definition will hereon be referred to as *frame elements*.

A quantitative study (Matthes & Kohring, 2008) explains that: the problem definition involves the central issue under investigation and relevant actors discussing the problem, causal interpretation entails diagnosing the causes by attributing failure or success regarding a specific outcome. It indicates who is deemed responsible for the failures or successes associated with the issue at hand. A moral evaluation can, according to the authors, be positive, neutral or negative and can refer to different objects than the causal agent. For example, science actors can be responsible for the benefits or risks of biotechnology that then affect consumers in a either a beneficial or risky way depending on the causal attribution and moral evaluation of the frame. Finally, a treatment recommendation can include a call for or against action (Matthes & Kohring, 2008).

Other quantitative scholars (Kensicki, 2004) have used questions relating to these frame elements to uncover the frames at the article level. The general questions relating to Entman's definition were posed as follows: (1) what does this article suggest is the main cause of the problem? (2) Who does this article suggest is mainly affected by the problem? (3) Who does this article suggest is mainly responsible for the problem? (4) Does the article mention any likelihood of solving the problem? (5) Does the article mention any 'call to action'? The other questions posed in the code sheet related specifically to the study's examination of poverty, pollution and incarceration (Kensicki, 2004). Since it is not explicitly stated, the first question is assumed to be related to problem definition, the second and third are understood as relating to the causal attribution, and the fourth and fifth as relating to the treatment recommendation.

In the described study, the cause-, responsibility- and effect questions were coded by considering six possible answers. Three actors (government, industry and non-profit citizen organization) and three attributes (individual, natural, neutral) were considered to be most relevant in that context. There was no coding of "other" actors or attributes. The coding was conducted in this way in order to quantify the answers, which is not the purpose of this study. The approach was text based, in the sense that coders had to "ascertain who caused the problem, who was affected by it, and who was responsible", as well as "discern what the text suggested was the likelihood of solving pollution" (Kensicki, 2004: 58). In that sense, coders had to rely on their interpretation of the articles, similar to the approach used here. The main difference being that the coders were two persons, compared to one coder in the present study, which allowed for inter-coder reliability testing that generated a good inter-coder reliability agreement (Kensicki, 2004). Reliability and validity concerns will be discussed more in a following

section. The coding did not allow for open-ended answers, which is not consistent with an inductive approach. The present study allows open-ended answers on all accounts: actors, causes, attributes, evaluations and treatments.

Both these quantitative studies provide guidelines for what these elements of the frame entail in terms of promoting a specific problem definition, causal attribution and treatment. However, it is not entirely clear how these quantitative studies deal with the moral evaluation element. In the first quantitative study (Matthes & Kohring, 2008) common risk- and benefit evaluations related to biotechnology were considered to promote a direct moral evaluation of the issue, affecting areas or actors in different ways. These evaluations include examples such as: health benefit/risk, economic benefit/risk and consumer benefit/risk (Matthes & Kohring, 2008). The second study (Kensicki, 2004) does not deal with this category, although it has been claimed that the operationalizing explicitly followed Entman's definition (Matthes, 2009). Thus, the present study will have to rely on the risk and benefits evaluations related to vaccines and vaccination as they are encountered in the articles.

The present report builds on these operationalizations of the Entman's definition of frame and its related frame elements but complements the coding by considering framing devices that indicate the latent structure of the frame. It has been argued that the latent meaning of any frame can be translated instantaneously by specific types of framing devices such as catchphrases, metaphors, allusions to history, culture or literature (Nisbet, 2010). The idea fits well with Entman's (1993) point about salience and the process of emphasizing certain information so that the audience will notice it more easily (Van Gorp, 2007). Entman argues that this can be done by associating bits of information with culturally familiar symbols (Entman, 1993: 53). Other devices that can be taken into account are contrasts, lexical choices, emotional, logical and ethical appeals and more (Van Gorp, 2010).

Causal reasoning is not always explicitly touched upon in the news, but these so-called framing devices can implicitly promote a certain causal reasoning (Van Gorp, 2010). This perspective puts forth that framing can only be effective when connects to a latent structure of meaning to which the audience can relate (Van Gorp, 2010). Therefore, qualitative researchers argue that framing devices must be taken into account when uncovering frames (Van Gorp, 2007).

The insights from this paradigm are understood as follows. Framing devices are discursive elements that give weight to certain considerations relating to each of the framing elements in the organizing structure of the frame. For example, in the context of measles spreading across the US, the consequences of parents not vaccinating their children has been

compared to an American authors book about a “post-apocalyptic America ravaged by plague” (NYT, 02.05.2019). This allusion to history and literature is considered to shape the understanding of the consequences of non-vaccination. This framing device thus plays into evaluating the consequences of the problem, which is a function relating to the frame element: moral evaluation. Further, lexical choices might also be used emphasize who is mainly affected by the problem. The consequences of the measles outbreak for parents with infants ineligible for vaccination is described as “agonizing” and “upending family routines” which signals that the effects of the problem are negative for this group in particular (NYT, 02.05.2019).

It should be noted that a frame in any particular text may not include all four frame elements. Scholars have noted there must not be a consistent relationship between all frame elements in order to form a powerful perspective (Scheufele & Scheufele, 2010). In some instances, certain frame elements may be more effective than others depending on the issue. Scholars take the example of disasters and scandals to demonstrate this difference (Scheufele & Scheufele, 2010). In the case of disasters, causal and responsibility considerations tend to dominate in public discourse and framing. While in the case of scandals, political standards and norms are violated. Consequently, value framing and moral considerations are likely to be more powerful than other types of framing (Scheufele & Scheufele, 2010).

5.2.2 Coding of articles

5.2.2.1. Clarifications

First of all, the unit of analysis is the article. Literature reviews demonstrate that frames are most commonly coded per article (Matthes, 2009). Additionally, most text-based framing studies extract frames inductively without the use of data-reduction techniques or computer-assisted content analyses (Matthes, 2009). Accordingly, the present report joins the group of inductive qualitative studies with an interpretive focus. This study assumes, based on the formulation of the concept of frames as provided by Entman, that news items are generally structured in a way as to promote a single frame. It does not reject the notion that an article can contain multiple frames, and certainly not that audiences are “exposed to an even greater number of distinct frames across a series of articles” (Chong & Druckman, 2013: 253). However, if a frame is constituted by the aforementioned frame elements it is assumed that it does so in such a way as to “thoroughly pervade the text” and other frames that expert readers might pick up from careful analyses are “likely to possess such low salience as to be of little

practical use to most audience members” (Entman, 1991: 22). In all, the present report assumes that a frame is the sum of its parts, that is, the sum of the frame elements (Matthes & Kohring, 2008).

5.2.2.2. Procedure

All the articles for the analysis have been analyzed using the methodology described above. First, all articles were read multiple times in order to understand the articles. Then the articles were approached one at a time, taking into account: the central issue under investigation; who caused it, who is affected, who is responsible for solving it; negative, positive or neutral evaluations of objects and agents; and finally, if there is a mention of solving that problem, what is suggested or implied as the treatment. After that, relevant excerpts of the texts that were considered indicators of the problem definition, the responsible actor, the causal interpretation, moral evaluation, and/or treatment recommendation, were placed in a corresponding column in a coding scheme. Framing devices such as lexical choices, historical examples, emotional and ethical appeals were considered simultaneously as they make certain considerations more salient, and were included in the scheme. These framing devices were considered to undergird the evaluations of consequences, shape the understanding of the responsible actor and affected groups, and so forth. All the strategically collected sets of texts were placed in an inventory of the indicators of the frame for each article.

When all the articles were coded according to the content analytical categories and related framing devices as described, the relationship between the frame elements were considered for each article. The inventory sheets were compared and categorized by considering which articles overlapped in their causal reasoning determined by the relationship between the frame elements. The main merit and challenge of framing analysis is deciding the level of abstraction (Van Gorp, 2010). The level of abstraction was assumed to increase when the coding sheets are compared and separated from the specific news stories. The final names of the frames were determined by how these elements were fused together to create a coherent unit, the frame. For example, all the articles that held policymakers responsible for enabling vaccinations were labeled *public accountability* frames. The general public was deemed the affected party within this frame. More specifically, the framing considered the risks of not getting vaccinated and benefits of vaccination for specific groups of the public, including women, children, and adolescents. There was a clear emphasis on the obligations of government to enable these groups in their pursuit of obtaining vaccinations. The risks, in terms of safety concerns of the

specific vaccines, were addressed but discredited by reference to scientific studies as a way of promoting the vaccines. Finally, the frame included calls for policy action or other political initiatives to promote the vaccines.

Notably, some articles involved more straightforward categorizations based mainly on explicit statements assigning responsibility or blame. For example, the *moral obligation frame* clearly connects to the organizing principles. Parents were clearly held responsible for not vaccinating their children, blamed for causing harm to others, and the proposed treatment for individual parents to vaccinate their children for the sake of public wellbeing. Moral evaluations were heavily emphasized by incorporating emotional appeals of the affected parents.

In other instances, the categorization was not as straightforward. For instance, not all articles included treatment solutions, but may have overlapped with the remaining frame elements. These were still assumed to promote the same “powerful perspective” and a certain causal reasoning (Scheufele & Scheufele, 2010: 130).

5.2.3 Selections and limitations

The selection of case, online news outlets and limitations are discussed below.

5.2.3.1. US case

The US as a case is interesting for several reasons. First, the general public is considerably divided along ideological lines and the research suggest that the gaps are widening (Pew, 2014). Secondly, political ideology seems to play a role in forming attitudes toward a range of issues including climate change (McCright & Dunlap, 2011) stem cell research (Nisbet, 2005) and more importantly, willingness to vaccinate against measles, mumps and rubella (Baumgaertner et al., 2018; Rabinowitz et al., 2016; Hamilton, 2015) and that predispositions associated with political conservatism and liberalism affected perceptions of the HPV vaccination (Kahan et al., 2010). These trends hold important implications for finding common ground on policy issues in general, and the success of public health programs – like vaccination programs – in particular. Most public health issues are not intrinsically partisan, so it is easy to miss their potential to generate polarized attitudes (Baum, 2011). It is important to follow up and examine how the media deals with these issues, considering that the media has influence over what perspectives and considerations are put forth in these debates.

More specifically, it seems scholarly interest in media coverage of the HPV vaccine as waned (Gollust et al., 2016). Perhaps because there is a delay in publications, or because it

is not as ‘hot’ of a topic in public debate as it was during the period of high scholarly attention. The present study, along with others (Gollust et al., 2016) would argue that it is still theoretically intriguing to examine the media coverage in periods where media attention and political engagement is relatively low (Nisbet et al., 2003). Additionally, few have examined the media coverage of the MMR vaccine since the recent outbreaks. There might be a delay in the publication of such studies as well. But considering that a recent study found that new mothers reported being affected by the media coverage during the 2015 measles outbreak (Cataldi et al., 2016), it seems important to examine the frames during such events.

5.2.3.2. Online news outlets

A recent survey from Pew Research Center shows newsreaders have migrated online from printed newspapers (Pew, 2016). Online news consumption, including social media, is second only to television news consumption which remains a dominant source of news consumption in the United States according to Pew Research Center (2018). Among the 38 percent that prefer to read news, 28 percent said they get their news from news websites and 18 percent from social media (Pew, 2016). According to Pew Research Center, the trends suggest that online news consumption may be closing in on TV news consumption (Pew, 2018). This in turn, underscores an examination of online news media sources. On that note, recent Reuters Institute surveys (2017; 2018; 2019; 2020) have listed the top online brands weekly reach, among which both the New York Times and Fox News are continuously in the top five most recently visited online news outlets among Americans.

5.2.3.3. ‘Media bias’

These two online news outlets, the New York Times and Fox News, are interesting for another reason as well: their relative ideological slant in news reporting. Relative here has a threefold meaning. First, as in relative to each other. Research has found that these two outlets were the most ideologically distant mainstream outlets in terms of slanted content (Budak, Goel & Rao, 2016). Secondly, relative in the sense that audience composition as an indicator of ideological slant only provides a *relative* measure of slant, not an absolute measure (Budak et al., 2016). Thirdly, in the sense that the differences in ideological slanted content is relatively small (Budak et al., 2016).

Literature on media bias have mainly used two approaches to determine media bias, audience-based and content-based approaches. Audience-based approaches base their labeling

of left- and right-leaning media on the audience composition of the outlets (Flaxman et al., 2016).

One academic study estimated the fractions of each online news outlet's readership that voted for the Republican candidate in the most recent presidential election, and called it the conservative share (Flaxman, Goel & Rao, 2016). Their measures rendered the New York Times with the second lowest conservative share after BBC, and Fox News with the second highest conservative share after Newsmax. The authors conclude that the results were consistent with conventional wisdom regarding the slant of the particular outlets (Gentzkow & Shapiro, 2011), but it was put forth that the approach "admittedly imperfect" in determining slant (Flaxman et al., 2016).

Another approach was taken by the Reuters Institute (2019) which determined the audience composition of these outlets based on respondent answers demonstrating a left-right-polarization in the audience make-up. New York Times with a left-leaning audience composition and Fox News with a right-leaning audience composition (Reuters, 2019).

Audience-based approaches are based on the idea that consumers favor news outlets that is closest to their ideological ideal, implying that the political attitudes of an outlet's audience are indicative of the outlet's ideology (Budak et al., 2016). It has been argued that this approach has produced sensible ideological orderings of outlets, but that it only provides a relative, not absolute, measure of slant (Budak et al., 2016).

Content-based approaches have been conducted within the academy (Groseclose & Milyo, 2005; Gentzkow & Shapiro, 2010; Budak et al., 2016) as well as by non-profit organizations that determine media bias (Allsides, 2020). Older studies have found the New York Times to have a liberal slant and Fox News Cable to have a conservative slant according to their measures (Groseclose & Milyo, 2005). A subsequent study did not include the Fox News organization in their study (Gentzkow & Shapiro, 2010), but also found correlations between their language-based ratings of slant and reader-submitted ratings of slant, with the New York Times at the liberal end of the spectrum.

The most recent among these content-based studies investigated the selection and framing of political issues in fifteen major US news outlets (Budak et al., 2016). Human coders determined the ideological slant by the article, which was then computed to an outlet-level measure of slant, the outlet's score being the average, popularity-weighted slant of the news and opinion articles in that outlet. The outlet-level slant results demonstrated that New York Times and Fox News were the most ideologically distant mainstream outlets in the sample (Budak et al., 2016). However, the slant co-efficient demonstrated small differences (Budak et

al., 2016). Further, the partisanship score was more extreme for opinion pieces than news, but the ideological ranking of the outlets was approximately the same as when the opinion stories were included. Finally, the study compared the ideological slant for different topics, terming it issue framing. While the differences were small, they found that Fox News was consistently on the right of the New York Times on every issue examined (Budak et al, 2016).

In the aforementioned study, measures were taken to ensure that the coders evaluation of the articles were not affected by the coders perception of an outlet's ideological leanings, by basing the primary analysis on results from the blinded condition, in which coders did not see the outlet source (Budak et al., 2016). A media bias organization (AllSides, 2020) used a similar approach. Both the New York Times and Fox News online content have been subjected to blinded bias evaluations, in which readers read and rate articles blindly – without knowing the source of the content. The final ratings on their website is comprised by a range of measures, including analyses by the editorial staff of the organization; third-party analyses such as academic research, surveys, or other third parties with a “transparent system for evaluating the bias of multiple sources” (AllSides, 2020). They assert that their ratings are not determined by community votes on their website (AllSides, 2020). These measures rendered their evaluation of the New York Times online news content as “left-leaning”, as in left of the center, but not as strong of a liberal bias as their category termed “left.” Fox News online content was evaluated as “right-leaning”, as in left of their center category but not as strong of a conservative bias as the “right” category.

The rationale for cautiously terming these outlets left-leaning and right-leaning respectively is based on their audience composition as an indicator of political slant (Gentzkow & Shapiro, 2010; Flaxman et al., 2016; Reuters, 2019); their relative ideological distance at the outlet-level estimates of ideological position (Budak et al., 2016); as well ideological differences in issue framing (Budak et al., 2016), academic research indicating slanted media coverage (Groseclose & Milyo, 2005; Gentzkow & Shapiro, 2010) as well as that of media bias think tanks/research organizations (AllSides, 2020).

Initially, the author assumed that it might be of interest to examine news outlets with consistent and relatively distant ideological audience compositions given that political identity has emerged as a predictor of parent's attitudes toward vaccination and that political identity is tied to choices in media outlets (Buckman, 2020; Mesch & Schwirian, 2015). Notably, there are only small differences in the overall ideological slant the outlets' news coverage, with some indications of ideologically slanted framing of different issues, not including vaccines or vaccination (Budak et al., 2016). Therefore, it is not certain that their framing of these particular

issues will be politically slanted, nor does the present report aim to measure ideological slant of the framing, which has proven to be a methodological challenge in its own right (Budak et al., 2016).

5.2.3.4. Selection of articles

The rationale for the timeframe chosen for the HPV vaccine is that content analyses have mostly examined the period prior to its licensure by the FDA in 2006 until the end of the year in which the vaccine was recommended for boys as well as girls by the CDC, 1 January 2006 until the 31 of December 2011 (Fowler et al., 2015). Few major news events, comparable to a measles outbreak as in the case of the MMR vaccine, were identified beyond this particular date. The timeframe was set to 1st of January 2012 to the 31st of December 2019. The timeframe spanning from that of the latest content analysis regarding the HPV vaccine in an American context, up until the end of year 2019, the latest full year at the time of writing. Regarding the timeframe for the MMR vaccination, it was set to one full year, ranging from 1 January 2019 through 31 December 2019. The rationale for this being that the US suffered the largest measles outbreak since its elimination in 2000.

The collection of articles was made using the online search function of the respective news outlets website, nytimes.com and foxnews.com. The websites search engines differed both from each other and that of common databases for collection of online newspaper articles. Consequently, the search words for the respective websites also differ. This approach was nevertheless deemed the most comprehensive as commonly used databases (Factiva and ProQuest) for article collection rendered incomplete samples. Media type was set to “Articles” for both outlets and both vaccines, and the timeframe set as explained above. Search words for the HPV vaccine on the New York Times website included “HPV”, “HPV vaccine”, “Gardasil”, “Cervarix” and “Human papillomavirus.” The search words: “HPV”, “Gardasil”, “Cervarix” and “Papillomavirus” were used to search the Fox News website. The brand names for the licensed HPV vaccines in the US *Gardasil* and *Cervarix* were also included in the searches. The New York Times search for articles regarding the MMR vaccine render search words including “MMR” “Measles”, “Mumps”, “Rubella”, “anti-vaccination” and “anti-vaxx.” While the Fox News article search included the search words: “MMR” “Mumps” “Measles” “Rubella”, “vaxx” and “anti-vaccination.” Fox News website did not allow for quotation mark searches, for example, a search for “Human papillomavirus” would include all articles on the website that included the first word “human”, which explains the odd search words. Casting a

wide net was assumed to minimize the loss of any relevant articles. However, the different search words might still affect the corpus of retrieved articles from each outlet, and in turn, representativeness of the samples and comparisons that can be made.

At the first stage of selection, all ‘weekly quizzes’, letters to editors, ‘bits’, transcripts of video, and briefings were excluded. The second stage eliminated all articles not relating to the US context. The third stage eliminated all articles with a word count lower than 500 words. Scholars have cautioned that, at times, news stories can be “frameless” (Van Gorp, 2010: 94). This can happen when the news story is a merely a short informative message, for instance, a brief story about a car accident (Van Gorp, 2010). To circumvent this, short articles – under 500 words – were excluded from the sample. At the fourth selection stage removed articles that were not mainly about the vaccine or vaccinations. Indexed articles from other news sources as well as mixed-contribution articles qualified if they passed the threshold of selection criteria. All the professional editorials or columns were kept in the sample taking after previous studies (Quintero Johnson et al., 2011; Nisbet & Huge, 2006) as well as by the reasoning that the entire discourse is relevant to the study (Reese, 2010). Furthermore, articles meeting criteria were not discriminated based on section in the paper, such as ‘politics’, ‘women’s health’ or other.

The selection process, in the case of the HPV vaccine, rendered 51 articles in Fox News and 49 in the New York Times. Articles covering the MMR vaccine counted 68 in Fox News and 75 in the New York Times. 15 articles were randomly selected from each of these four samples to render a total of 60 articles for the empirical analysis.

This speaks to the intensity of media attention regarding these issues during these periods of time. The total amount of articles regarding the MMR vaccine was higher during a year than the total amount of articles regarding the HPV vaccine during a period of eight years. However, this only applies to these two case studies.

5.2.3.5. Limitations – reliability, validity, and generalizability

This study joins the category of inductive qualitative framing studies, with an interpretive focus (Matthes, 2009). The linkage between the elements of the texts in the articles and the central frame, are guided by the theoretical understanding of a frame, but requires interpretation of the person doing the analysis (Van Gorp, 2010). Both quantitative and qualitative research involves interpretation of the person doing the analysis. As mentioned, coders using frame elements to define frames had to “discern” and “ascertain” what was the cause, the responsible actor, and who affected in their assessment of articles (Kensicki, 2004: 58). The difference between that

study and the present one, is that it allowed for comparisons of the extent to which the coders evaluate the characteristics of a message and reach the same conclusion (Bryman, 2014). The present study relies on the interpretation of a sole interpreter. The internal reliability, similar to the inter-observer consistency or inter-coder reliability in quantitative studies, is thus affected by the fact that there is only one coder (Bryman, 2014).

Further, reliability and validity depend on the transparency in extracting frames (Matthes & Kohring, 2008). Reliability suggests that the same thing is repeated or consistent (Neuman, 2014). Reliability was attempted here by employing the same concept of a media frame to all the articles, grounded in the theoretical understanding of what constitutes a frame (Entman, 1993). Central to validity in framing literature is the way scholars made use of the frame definitions. Using frame indicators (or frame elements) is the preferred mode to merely citing theoretical concepts of framing to ground the reader (Matthes, 2009). However, the interpretive nature of the assessing the content in relation to the frame elements will affect the degree to which the results can be reproduced. For example, it is not certain that the articles lexical choices, contrasts, ethical appeals and the like, that are considered to underpin certain latent concepts, cultural understandings and considerations here, would be appreciated in the same way by another. Thus, one cannot rule out that there is a risk that researchers will differ in how they put these parts together (Matthes & Kohring, 2008). Nevertheless, creating and adhering to an analytical procedure and coding scheme of related frame elements will likely increase the validity of the study (Hsieh & Shannon, 2005).

Moreover, inductive approaches and manual coding are generally time-consuming projects due to the in-depth readings of the researcher (Van Gorp, 2010). This in turn makes it difficult to analyze large amounts of material in qualitative research (Scheufele & Scheufele, 2010). This also affected selection of outlets. Two outlets were chosen for the reasons described earlier but must be considered as case studies. The frames found in these outlets will not be representative of the media discourse in the US as a whole. Further, the sampling will affect the representativeness and conclusions which can be drawn from the results in reference to: what interest and perspectives dominate in media discourse during and over time in these particular periods. In terms of generalizability, unfortunately, case studies and small samples do not allow for strong generalizations (Matthes, 2009). The fact that the New York Times is a high-quality newspaper, and Fox News online is an extension of the Fox News Channel (Fox, 2020), a television news channel, will likely affect the quality of the articles retrieved from the website. The channel outspends its television news channel rivals (Pew, 2014) but it is not certain that these investments translate into quality articles online.

6 Framing analysis

A short summary of the results and disposition is followed by an in-depth analysis of the framing.

6.1 Results

The inductive framing analysis rendered the following frames: *social progress*, *scientific uncertainty*, *political conflict*, *public accountability*, *professional integrity*, *moral obligation*, and *social disruption*. These were determined by considering the relationship between the frame elements in each article and the overlaps between each article's frame-element relationship with other articles. Not all articles overlapped on each separate frame element, but the emphasis in the remaining frame elements taken together seemed to promote the same "powerful perspective" (Scheufele & Scheufele, 2010: 130). The following analysis discusses the frames in reference to each vaccine and each outlet in connection to the theoretical framework.

Contrary to the findings of previous studies, few of the frames found in the reporting on the HPV vaccine contained political elements, such as portraying competing interests, elite positions or the like. Instead, scientific perspectives dominated coverage on the HPV vaccine. More political elements were found in the reporting of the MMR vaccines. Standards of newsworthiness will likely explain this tendency (Briggs & Hallin, 2016). Events tied to the HPV vaccine were mostly new research findings, while the urgency of the measles outbreak and legislative debate dominated reporting on the MMR vaccination. As a continuation of this, the frames in coverage of the HPV vaccine were more focused on the vaccine per se, while the coverage of the MMR vaccine referred to vaccination as an activity, a course of action.

Moreover, some frames are perhaps best understood as more general tendencies of news media reporting, such as political conflict framing, attributions of responsibility and morality framing (Semetko & Valkenburg, 2000). While others were specific to coverage of a particular vaccine, such as the *professional integrity* frame in reporting on the HPV vaccine and *social disruption* in the case of the MMR vaccine. Still, such claims of responsibility could plausibly occur in other health related contexts, or in reporting on social movements.

6.1.1 Disposition

The analysis is structured as follows: one vaccine is discussed at a time, starting with the HPV vaccine, followed by the MMR vaccine in a separate section. The frames featured in the coverage of a particular vaccine are discussed in relation to each outlet's specific use of the frames. Introduction of a new frame to the analysis is done by summary of its defining qualities at the benefit of the readers comprehension. Some repetition is unavoidable particularly in the section regarding the MMR vaccine as some frames, explained in the section for the HPV vaccine, reoccur also in coverage of the MMR vaccine. Frames are indicated by italics in the flow of text.

6.2 Analysis of frames

The HPV vaccine is discussed first with a summarizing discussion, then the MMR vaccine with a summarizing discussion.

6.2.1 Covering the HPV vaccine

The following analysis will show that articles focused both on the vaccine itself and the act of vaccination. Overall, the framing of the vaccine was similar in both outlets, with some minor differences. The scientific frame *social progress* dominated the coverage in both outlets.

6.2.1.1. Political conflict

The *political conflict frame* is focused on disagreement over vaccination. One or more political actors—interest groups or legislators—were portrayed as causing the problems, which are centered on the dispute over the appropriate vaccination conduct or policy. The articles reflected two or more sides in disagreement over vaccination. The frame found here overlaps somewhat with other definitions of conflict framing, as stories refer to two sides or more of the problem (Semetko & Valkenburg, 2000). As a consequence, moral evaluations were relatively infrequent, as were treatment solutions. The main purpose of these stories seemed to be the balancing claims about the issue, not necessarily finding a solution. A frame most prevalent, not in reporting on the HPV vaccine, but on the MMR vaccine. The frame is discussed in

relation to the HPV vaccine below but since its use is more defining of the media discourse regarding the MMR vaccine, it will be discussed more extensively in an assigned section.

Despite its minority then, one article was categorized as a *political conflict* frame in the coverage of the HPV vaccine. It focused on the conflict between lawmakers, and between lawmakers and parental group opposing legislative requirements of HPV vaccination in entering sixth grade, with religious and medical exemptions. The article presented Democrats aligning with CDC recommendations regarding the HPV vaccine's safety and effectiveness, which was contrasted against "some Republican representatives [that] said they'll try to change the requirement legislatively next year" (Fox News, 18.08.2015). One Republican representative echoed the opposition of the parental group, conveying that exemptions from mandatory vaccination should allow parents to opt out if choosing to do so. Other Republicans were quoted saying "that the health department has gone too far" (Fox News, 18.08.2015). No suggested solution to the issue was found.

What is of interest in this context, is the 'right to choose'-rhetoric that the parental group is voicing, which the Republican actors also seemed to support. This rhetoric is characteristic of the pro-choice stance in the abortion debate, which is generally associated with liberals. Interestingly then, in the context of vaccinations, it is instead conservatives who are applying this logic.

The fact that this frame was so infrequent will be critically discussed later on.

6.2.1.2. Public accountability

The difference between the *political conflict* frame and the *public accountability* frame is that the former casts vaccination in terms of conflict and competing interests, while in the latter vaccination is not objected to questioning but portrayed as a given public health benefit that policymakers ought to actively promote. In the *public accountability* frame, public authorities were understood as one entity, towards which claims can be made in the name of the public interest. It did not suggest that conflicting interests among legislators or groups were causing the problems. Rather, the framing demanded responsibility of public authorities to act in the public's interests – that is, enabling vaccination for various groups in society, at the benefit of these groups and public health as a whole.

In a sense, the frame might be considered a type of responsibility framing comparable to other generic frames labeled responsibility framing elsewhere (Semetko & Valkenburg, 2000). It was not suggested that government were causing the problems, such as low

vaccination rates. The consequences, rather than the causes, were in focus – and also, who should resolve them. It suggested that government has ability to alleviate these problems and called for urgent action, in line with previous research on responsibility framing (Semetko & Valkenburg, 2000). By consequence, individuals were alleviated of responsibility to solve the issues, and government involvement in providing social assistance was emphasized.

In the context of HPV vaccine coverage, only one article featured this frame: a column in the New York Times. The column rests on moral evaluations of the consequences of non-vaccination, calling the preventable deaths and related disease of the HPV-virus a “national scandal” (NYT, 28.04.2016). It made claims toward politicians urging them to include women’s health issues on the Democratic presidential candidates’ agenda, stating that “it’s a tragedy that nearly a dozen women die a day of cervical cancer in the United States” (NYT, 28.04.2016). It stated that this was “utterly unnecessary” since the “HPV vaccine prevents most cases of cervical cancer”, and yet few girls and boys get vaccinated (NYT, 28.04.2016). It held politicians responsible for knowing how to address these problems, but claimed they were not doing enough to solve them. Mandated treatment is implied as the solution to the problem, but more importantly policymakers are held accountable for not including women’s health issues in the political conversation.

What is proposed here, the re-entrance of HPV vaccine discussion into the political arena, may be exactly what is needed where the goal is to increase national vaccination coverage. On the other hand, the re-emergence of the HPV vaccine in the political arena allows for competing claims and concerns to enter the public debate again, which might overshadow other important perspectives, such as scientific perspectives (Krakow & Rogers, 2016). Still, it would provide the potential of re-framing the issue in a way that applies to a larger group of the population and attend to the political predispositions that people might have in evaluating this issue.

The emphasis on structural versus personal solutions is discussed in the following section.

6.2.1.3. Moral obligation

The *moral obligation* frame conveyed the moral responsibility of citizens to solve the societal problem of non-vaccination. It applied to parents by highlighting their obligations toward their own children as well as their obligation toward other members of society, even future generations. The overall problem definition in articles applying this frame was unvaccinated

children. There was clear causal attribution in the framing that held parents responsible for causing the problem by not vaccinating their children. Moral evaluations were heavily emphasized, focusing on the consequences that this choice has for other members of the public. The suggested solution was that parents should vaccinate their children for the sake of the public health.

In previous research the morality frame is understood as an organizing device for arguments and interpretations that are valence neutral. Meaning that the framing can take on different positions to an issue (pro, anti, neutral), although one position might be more common than other (Nisbet, 2009). Here, it was used solely for the pro-vaccination position by accentuating social prescriptions on how to act. Compare this to previous studies which showed that sexual morality was a prominent argument *not* to get the HPV vaccine or implement policy.

One article featured this frame and was found in the New York Times sample on the HPV vaccine, none in Fox News sample. The article attended to the parental misconceptions regarding this specific vaccine (e.g. increased sexual activity, questions of importance, a ‘girls-only’ vaccine), assumed to be the cause of low vaccinations rates. It called for parents to take urgent action, reading that: “what ... parents don’t understand is that we have a window of opportunity” to vaccinate children [...] We can’t say we’ll let them decide later in life” (NYT, 03.03.2017). Going on to say that “[w]e parents have a responsibility” and that “[w]e have to ask ourselves why we’re putting future generations at risk unnecessarily. We have to change the conversation from having sex to saving lives.”

There is evidently a heavy emphasis personal causes and solutions. Personalizing and emotionalizing the issue may be a way of capturing the audience interest (Semetko & Valkenburg, 2000). It calls for urgent action, parents should get their children vaccinated, for their children’s sake and generations to come. The public is thus invited to think about the issue as one that requires individual action for the ends of collective benefit.

In general, the moral obligation framing assigned the causes and treatments of the problem of non-vaccination to the individual rather than other societal conditions or government institutions (e.g. public officials or health experts). The practice of blaming individuals for health problems has been found to be common in American media (Hallahan, 1999 in Holton et al., 2012). It has been cautioned that invoking individual blame can weaken support for broader political, economic, or environmental solutions (Holton et al., 2012). Other studies have demonstrated frames mentioning personal solutions have been decreasing, and societal-level frames increasing (Holton et al., 2012).

On the other hand, it might still be valuable to include such personalized frames in reporting. It seems important to acknowledge that individuals do make choices that affect others and bear some responsibility for the consequences. Although, researchers have assumed that such frames will be most effective if individual stories also emphasize social determinants and barriers (Gollust et al., 2019).

6.2.1.4. Scientific uncertainty

The science frames found in the empirical analysis were predominantly the *social progress* frame in addition to the *scientific uncertainty* frame. Most surprising perhaps is that only one article in the whole sample (the MMR vaccine sample included) featured a *scientific uncertainty* frame. It is remarkable because in general, the scientific process involves some level of uncertainty, and in particular, because highlighting the scientific uncertainty of an issue has been used in pursuits of pushing political agendas, such as defeating environmental policies (McCright & Dunlap, 2003). Additionally, the media has been accused of overplaying the level of uncertainty of science (Corbett & Durfee, 2004; Boykoff & Boykoff, 2004). This tendency refers mainly to the context of climate change reporting, but also to the context of the MMR-vaccine-autism coverage (Clarke, 2008). Seemingly, it does not apply to the coverage of HPV vaccinations to any large extent. Again, only article in the sample was categorized as *science uncertainty* framing and was found in Fox's reporting on the HPV vaccine.

The problem in the article was vaccine safety and (mild) side effect of the vaccine. The scientific community were understood as the causal agent. But there were only subtle responsibility claims directed toward the science community for not being able to detect side effects earlier. While the risks of the vaccines were discussed, they were mild. Thus, the overall judgment of the article, was that these discoveries should be understood as an inherent element of the scientific process, as researchers have “continued to monitor the safety of the HPV vaccine” (Fox, 02.10.2012). The solution is continued research, sources conveying that “ongoing studies of HPV are still needed to examine the risk of side effects” and that “they noted that future studies should attempt to rule out effects that could be caused by pre-existing conditions” (Fox, 02.10.2012).

In fact, it is an example of what might be reasonably expected of reporting on new scientific findings that has found mild side effects of the HPV vaccine. It does not undermine expert consensus or call for peer-review, falsifiability or the like, which others have found to be a prominent frame in science-related debates (Nisbet, 2009). The framing might be

resembled to a definition found in the previous literature in which uncertainty is communicated as “an inherent feature of the scientific process or that further research may uncover unknown errors in our current understandings” (Gustafson & Rice, 2019: 682). This type of framing has been tested in a study of the perceived acceptability of different causes of uncertainty about food safety and was deemed the most acceptable type of uncertainty by the respondents (Gustafson & Rice, 2019).

Against this background, and the fact that uncertainty frames were so very few, the uncertainty of science does not seem to be a large part of the discussion on the HPV vaccine, at least not compared to the discourse on other scientific issues. For instance, research has found that the underlying science of climate change was continuously subjected to either promotion or attack by advocates and opponents of regulatory policies (McCright & Dunlap, 2011).

6.2.1.5. Social progress

The *social progress* frame is interesting because it is a testament to the fact that not all problems in the media attribute the cause of a problem to a specific actor. Previous research has demonstrated that issues like pollution and poverty can be portrayed as having a natural (environmental circumstances) or neutral cause (no actors deemed to cause the problem) (Kensicki, 2004). This does not mean that actors cannot be attributed responsibility for solving the issues or that the consequences are not mentioned. Unsurprisingly, research has found that individuals are often portrayed as the ones affected by a social problem (Kensicki, 2004). This is the case in the articles featuring a *social progress* frame, but problem is not a problem per se and the consequences are evaluated as beneficial. It was found both in the New York Times and Fox News and dominated both samples on the HPV vaccine.

Neutral causes such as the virus itself and the general lack of prevention were found to be the main causes of the problems. These articles focused on the breakthroughs that scientists have achieved in research on the HPV vaccine and how it would benefit public health. In other words, the scientific community was attributed the benefits of scientific progress, and the public was portrayed as the main beneficiaries of the *social progress*. In terms of frame sponsoring, it seems to originate from the scientific community as virtually all articles cover scientific findings and use representatives from the community as sources. Social prescriptions on how to act were provided, as it was either implied or explicitly stated that targets groups should get vaccinated. In this sense, moral evaluation might be considered the weightiest frame element as evaluations of the science progress, the vaccine and the health benefits are all

positive. The frame can therefore not be considered valence neutral, it is clearly pro-vaccination. Similar to scientific frames found elsewhere (Matthes & Kohring, 2008; Nisbet, 2009).

The conceptualization of the frame *social progress* overlaps with previous literature listing it in a generalizable typology of frames in science policy debates. In that study, it was conceptualized as a frame that defines science-related issue as “improving quality of life, or solution to problems” and “accenting the benefits to society” (Nisbet & Scheufele, 2009: 1772-74). It is also similar to the “research benefit” frame defined by another study: a frame that conveyed research findings and health benefits with enthusiasm (Matthes & Kohring, 2008).

In Fox News the social progress frame was used to highlight the successes of the vaccine in reducing infections and death rates caused by the HPV virus. Different types of cancers, which are undisputable threats to public and individual health in the minds of many, demonstrate the social problem to which the promoted HPV vaccine can provide a solution.

Fox News reported on research findings showing that the HPV virus causes a “mysterious” cancer, but that vaccinations have been found to protect against this cancer, which “further highlights the importance of vaccinating against HPV infection” (Fox, 19.01.2016). Words like mysterious alludes to scientists having solved a puzzle that in turn benefits society. It is also an example of what a neutral cause of a problem might look like in the articles. No actor is held responsible for causing cancers. Yet, actors can be responsible for successfully attending to or solving the problem: the science community in this case. Another article reports of research finding that “the cervical cancer vaccine” has cut infections by half, underscoring “how well it [the vaccine] works now that it is in general use” (Fox, 20.06.2013). These quotes are meant to demonstrate the promotional aspects of the frame.

In the New York Times the frame was featured in articles that emphasize the progress and future benefits of the vaccine. The technical or descriptive aspect of the frame relative other frames was demonstrated by an emphasis on factors such as effectiveness of the vaccine. One article read that: “[t]he vaccines are so effective that when given to enough young girls, they also give partial protection to both unvaccinated girls and boys” (NYT, 27.06.2019). And that: “cases of HPV infection in teenage girls had decreased by almost two-thirds” (NYT, 07.04.2017). This was characteristic of both the New York Times and Fox News articles using the frame, using statistics to underscore the positive developments found by researchers and that are beneficial to the public. Statistics and quantifications are typical framing devices (Van Gorp, 2010).

Compared to other frames it did not connect to specific societal or political values and cannot be analyzed in reference to such elements. The frame alluded to the general objective of improving public health and seems to originate from the science community. Notably, the vaccine is often referred to as a cancer vaccine. This could be understood as progress in terms of abating the stigma surrounding the vaccine, seeing as previous research has expressed concerns that focusing on sexual morality, news articles might prime audiences to think about the vaccine from a rather limited viewpoint (Quintero Johnson et al., 2011). News coverage that furthers the sexual morality argument might activate heuristics that suggest avoidance of an activity which appears as questionable in respect to sexual morality (Quintero Johnson et al., 2011). Focusing on the cancer prevention and beneficial aspects of the vaccine might invoke other heuristics.

6.2.1.6. Professional integrity – attributing responsibility to health experts

The frame *professional integrity* might also be understood as a responsibility frame, comparable to the *public accountability* frame. The frame presented the issue in such a way as to emphasize the responsibility of a specific actor: physicians in their relationship to patients (or rather parents of patients). It attributed the health care experts as an institution with responsibility for the cause and the solution to the overarching issue of hesitancy to vaccinate. The frame was used to convey the obligation of doctors in addressing parental misconceptions and actively promoting the vaccination in line with the scientifically based recommendations that guide their profession. By consequence, parents are pardoned for holding misconceptions that have created skepticism toward the vaccine. It differed from the public accountability frame in holding a different actor responsible.

Fox News use made use of federal official sources to convey that problem of nationally low vaccination rates could be attributed to doctors failing to inform and promote the HPV vaccine. Many of the reasons that parents listed for not pursuing HPV vaccinations could be related to failures of health care providers in informing the parents. It read that parents were under the impression that the vaccine was not needed and claimed that “no one recommended it to them” (Fox, 25.07.2013). “No one” in this context refers to doctors. Further, the article underscored that physicians were failing at conveying the importance of the HPV vaccine relative to other vaccines. Against the background of discrediting the promiscuity myth, it was proposed that “doctors ... take on a more active role in discussing HPV and the vaccine with parents” since “[r]esearch consistently shows that a provider’s recommendation to vaccinate is

the single most influential factor in determining whether a parent gets their kid vaccinated” (Fox, 25.07.2013). The emphasis on health provider responsibilities in the frame is in this way exonerating of parental responsibility, as they cannot be blamed for these institutional shortcomings.

The frame was also used in the op-eds of the New York Times. In one op-ed, the commentator argued that “the uptake of the cancer-preventing vaccine is abysmal” for “one reason: Doctors don’t want to talk about sex” (NYT, 19.04.2014). In this example, physicians’ responsibilities are (again) understood against a range of public misconceptions, including presumed promiscuity. According to the logic of the frame, the public is not blamed for holding such beliefs, while doctors are obliged to correct them. A final quote demonstrated the evaluation of the causal agent. It should be understood against the background of the thousands of deaths that are claimed to follow if children are not vaccinated, it read this would be “unconscionable ... [a]nd doctors will have only themselves to blame” (NYT, 19.04.2014). That is, if they do not address this problem.

As the aspects of attributing responsibility to individuals versus institutions has already been address, the context of the framing might be more interesting here. The interpretation of the framing is that misconceptions and moral convictions are valid for non-experts, such as parents, but that there is no room for moral convictions about teen sexuality in the capacity of being a physician. In this sense, it connects to the overarching idea that expert opinion should not be political or value-laden but rather guided by science. This specific frame is not featured in the sample of articles on the MMR vaccine. Rather, it seems to be a response to the issue-specific public misconceptions the HPV vaccine.

Further, it might best be understood as a response or counter-framing to the argument about increased sexual activity promoted early in the debate. The frame is interesting for at least two reasons. First of all, it seems the argument promoted by a conservative religious interest group has lingered and might be affecting parents (and perhaps doctors) in their decisions to vaccinate or recommend vaccinations. Secondly, it implies that personal values and expert opinion should be kept separate. Scholars have argued that it is problematic when personal values of experts influence the scientific process, especially when interpreting evidence, because it violates scientific integrity (Suhay, 2017; Douglas, 2015). Medical care is expected to be based on scientific evidence and personal values are not considered appropriate evidence in this process (Suhay, 2017).

Although the frame was featured in this specific context, it does not seem unreasonable that the media would attribute responsibility to health care experts for causing and solving problems in other medical or health related issue contexts.

6.2.1.7. Summary and discussion

Overall, the framing of the vaccine and vaccination in both outlets is quite similar. The main difference is the *political conflict* frame and *scientific uncertainty* frame found only in the Fox sample, and the *public accountability* frame and the *moral obligation* frame in the New York Times.

Conflict framing in the media has generally been found to have negative effects on public attitudes and support (Gollust et al., 2010; Fowler & Gollust, 2015). The *political conflict* frame was not prominent in the analyzed sample on the HPV vaccine. However, this probably has to do more with the size of the sample than anything else, this is discussed also in the general discussion. The same goes for the *scientific uncertainty* frame. For now, it seems that the scientific perspectives dominated in both outlets' samples. And as aforementioned, researchers believe that framing science can provide a venue to improve the public's understanding of the importance of science-related issues (Scheufele, 2006). This might be understood as such an instance.

What is perhaps more interesting is the absence of some previous types of framing. When the HPV vaccine emerged, journalists relied on a familiar expert source: conservatives, to provide the moral counter-argument to an emerging issue, namely the notion that the HPV vaccine could encourage young girls engage in riskier sexual behaviors (Fowler et al., 2012). Literature on the framing cycle of any emerging issue explains this initial framing, in which the emergence and conflict over problem definition phases of framing requires differing viewpoints (Fowler et al., 2012). Interestingly, it seems that this initial framing of the issue has at least some lingering consequences to which the media, the science community and health experts must now respond. Again, considering the context of the *professional integrity* frame.

The social progress frame dominated the coverage while voices of interest groups, such as religious advocacy groups for traditional family values, did not. The dominance of this frame is plausibly explained by the fact that the vaccine debate has returned to a more technical or administrative state in the policy and public arena (Nisbet & Huges, 2006). During the examined time period the vaccine was not in an overtly political stage. There were few actual news events during the examined decade in which such a frame would naturally form. In the

absence of powerful leaders pushing a frame, journalists would have to construct such a frame, and ‘crusading journalism’ is both time consuming and something that the profession discourages (Lawrence, 2010).

In sum, there is generally a promotional stance toward the vaccine that highlights scientific findings and social benefit.

6.2.2 Reporting on MMR vaccinations

To reiterate, the overall reporting of the MMR vaccine centered on vaccinations rather than the vaccine itself. Vaccination was cast in a setting of competing political interests. Vaccination was otherwise framed in terms of responsibility claims towards authorities and moral obligations of individuals. Finally, the anti-vaccination movement was portrayed as a disruptive force in society.

6.2.2.1. Political conflict

Again, the *political conflict frame* focused on disagreement over vaccination. One or more political actors – interest groups, or legislators – are portrayed as causing the conflicts, which are centered on the dispute over the appropriate vaccination conduct or policy. The articles reflected two or more sides in disagreement over vaccination conduct. Causal attributions assigned blame to one or more of these political actors for creating the conflict. Where treatment solutions were suggested they align with one of the conflicting positions, such as strengthening vaccination laws. In other instances, treatments were not suggested or implied and the question was left open. For example, one article concluded by simply referencing the conflicting positions, it read that “supporters argue the new legislation would protect children ... and those in opposition say vaccines are not universally safe” (Fox, 14.09.2019).

The mandatory aspect of vaccination legislation evidently creates tensions among the public, which in turn seemed to create opportunity for framing vaccinations in terms of conflict and competing claims.

In Fox News, an article portrayed the issue of vaccination laws as a conflict between a ‘civic duty’ to vaccinate on the one hand and religious freedom, parental liberties, and the right to education on the other. Arguments for vaccination legislation were put forth mainly by doctors, claiming it would “stomp out the disease,” and opposing arguments were raised by parental groups – “up in arms about the idea” (Fox, 10.05.2019). The conflict extended to the elite realm as well, emphasizing that both political parties were split in their stance on the issue.

This is a testament to how these articles are often constructed. Conflicting perspectives are lifted without any suggested solution. Moral evaluations of the agents and consequences are relatively few since the aim of the framing seems to be guided by the journalistic norm of balance, that is, presenting the diversity of positions (Dixon & Clarke, 2012). This did not exclude the possibility of evaluating agents and the effects, as we will see, but it did not occur in all the articles.

Evolutions of elite positions may be of particular interest considering some of the arguments raised in the reporting. For example, a Democratic legislator was quoted saying that Democrats were “handmaidens to the pharmaceutical company whose only mission is to increase sales and profits” (Fox, 10.05.2019). This claim has been dismissed as unfounded (Lam, 2015 in Wolters & Steele, 2018), but in such instances, the public is left the notion that such claims are potentially valid in the debate on vaccination legislation. This applies to the claims raised by interest groups as well, as we will see.

In general, the public is assumed to have an interest in how these debates play out. Suggested solutions are believed to enable people to act on existing ideas and motivations (Dixon & Clarke, 2012). However, research has found the tendency to omit ‘calls for action’ is a typical feature of news media framing (Kensicki, 2004), leaving the public without solutions to help alleviate concern.

In other articles featuring the frame, some lawmakers were portrayed as in favor of mandatory vaccination and opposing claims were embodied mainly by parental interest groups. For instance, one article centers on the conflict over the “some of the toughest immunization laws in the country” (Fox, 24.04.2019). The problem is that lawmakers want to make vaccine legislation even stricter, while the opposition was “up in arms” about the idea (Fox, 24.04.2019). Legislators were criticized for wanting to control all the aspects of vaccine legislation, including the opportunities for opting out of mandatory vaccination. Opposing parties were featured claiming that legislators are acting in self-interest rather than in the interest of public health. A source is quoted saying that supporters of the bill “are more concerned about achieving a 100 percent vaccination rate ... than they are about these children who are vulnerable of being injured or dying from a vaccine” (Fox, 24.04.2019). The article does not suggest a solution to the problem.

In another article, parental groups claimed that mandatory vaccines violate their religious freedom, constitutional rights to due process, and that forced vaccination would put their children at risk to harm (Fox, 15.04.2019). They were quoted claiming that the mandatory vaccination “grossly understate[s] the risk of harm to children, adults and the general public

from the MMR vaccine, while at the same time overstating the benefits” (Fox, 15.04.2019). This is contrasted by claims from the federal public health agency CDC, asserting that the vaccine is effective and safe. In this case, vaccination was *implied* as the solution for combatting the measles outbreak. Nonetheless, this type of framing risks following the reporting trend of “false balance reporting” in which a scientifically based perspective alongside is featured alongside other perspectives with less or no support (Dixon & Clarke, 2012). It has been cautioned that such media portrayals might give an erroneous impression of the uncertainty about the evidence for or against risk, in turn, creating a disconnect between scientific discourse and public discourse (Dixon & Clarke, 2012).

In the New York Times, the frame was also used to portray the conflict over vaccination laws among individuals and legislators, and between individuals and legislators: “pitting neighbors against neighbors” and “sometimes paralyzing statehouses” (NYT, 14.06.2019). In the New York Times, moral evaluations of the subjects, causes and consequences were more pronounced, as were references to history and the identification of legislators’ party affiliation and their stances.

One article portrayed the issue of vaccination laws as a conflict mainly between Democrats and parental groups. Republican legislators in opposition to mandatory vaccination siding with the opposition of parental groups, played a smaller but meaningful role. The oppositional stance was discredited by lexical choices, such as calling vaccination “the norm” and calling eliminating legal exemptions “a step forward” (NYT, 14.06.2019). Historical references to the Holocaust in turn function to delegitimize the oppositional position further, protesters having worn yellow stars and called the legislators “Nazis” (NYT, 14.06.2019). This group was claimed to be “small and impassioned [...] drawing support from conservatives wary of what they see as government intrusion into personal life decisions” (NYT, 14.06.2019). There was no explicit call for action on the policy issue. However, it was implied that vaccinations and vaccination laws are valuable, and that op-outs are not.

What is particularly interesting in this context is that it references to other politically contentious issues functioned as a way of manifesting the sense of conflict pertaining also to this issue – crossing issue domains. The article read that a “bill was scuttled when Republicans in the State Senate walked out of the session and could not be coaxed back until both the vaccine bill and a gun control bill were dropped” (NYT, 14.06.2019). Grouping together mandatory vaccination and opposition to gun control might signal to the public that both issues adhere to the conservative sphere, as the right to arms has manifested itself as a conservative issue in

public discourse. Even more so when it was conveyed that the issues were equally deal-breaking for the Republicans in the state senate.

In another article, political conflict over vaccination was suggested as the cause of hesitancy toward vaccines and to legislative measures. It was argued that internet and social media use is a consequence of political polarization because policies that allow for opt-outs “expanded before the advent of social media — [and] are associated with substantially higher rates of unvaccinated children” (NYT, 06.03.2019). The expansion of exemptions to vaccination laws was discredited and referred to as “elevating fringe views” and eliminating exemptions was referred to as “a public health success” (NYT, 06.03.2019). Calls for the elimination of exemptions to vaccination laws were explicitly stated. The causal agents were also evaluated. It stated that a Republican legislator’s reported spread of misinformation – him having claimed that “people weren’t dying of measles in America because of “antibiotics and that kind of stuff” – could have “a great deal of influence on public health when it has the force of law behind it” (NYT, 06.03.2019). Another legislator was also referenced, him having called the elimination of exemptions “Communist” (NYT, 06.03.2019).

The conflict was thus conveyed as one between Republicans – advancing fringe views and on top of this, spreading misinformation – and Democrats pursuing the elimination of exemptions. This value-laden language on both ends, is likely to resonate with constituents.

In particular, this type of portrayal could play into what scholars call the for-science versus anti-science framing, the former position attributed to Democrats and the latter to Republicans (Hardy, Tallapragada, Besley & Yuan, 2019). Researchers have suggested that science is becoming an ‘identity marker’ for liberals, which might lead conservatives to infer that science is driven by a liberal ideological agenda and therefore deem it less credible (Hardy et al., 2019). Identity marker is another conceptualization of partisan cues, which informs partisans what it means to be associated with a political party such as the Republicans or Democrats. Framing effects studies have showed that framing resting on such cues has the potential to further politicize and polarize science and science-related issues (Hardy et al., 2019). It lies beyond the scope of this study to evaluate to what extent such claims are featured in the media discourse, but it would be interesting to see if this constructed idea is stretching into the discourse on the MMR vaccination as well. Directions for further research are provided in the final chapter.

It is not all to surprising that articles on the issue of vaccination laws featured political conflict frames. Lawmaking is inherently political, bound to involve conflict, debate and disagreement. Scholars have demonstrated that political conflict framing is common in media

coverage, it is even expected on political issues involving legislation (Feldman et al., 2017; Gollust et al., 2013; Fowler & Gollust, 2015).

6.2.2.2. Public accountability

To reiterate, the *public accountability* frame put forth government as the responsible agent, the affected party was understood as the public, or groups of the public. It was not suggested that public authorities caused the problems, but they were held responsible for aiding it. The frame demanded responsibility of public authorities to act in the public's interests – which in this context, meant enabling vaccinations for various groups in society. In the case of the MMR vaccine, the articles mainly make responsibility claims on behalf of minors. The suggested solution in this case was legislation or other official initiatives to promote vaccination.

In a sense, this type of framing is an expression of the normative role of the media: acting as an important channel of communication between policymakers and the citizenry and holding political institutions accountable for the realization of the public's political claims (Esser & Strömbäck, 2014). The frame was used both in the New York Times and in Fox News.

In Fox News, the frame was featured in a report on teenagers being denied vaccination by their parents. Parents were held responsible for creating this problem, forcing their children to take “matters into their own hands” by turning to social media platforms for advice on how to pursue vaccinations (Fox, 12.02.2019). Parents are portrayed as unjustified in their anti-vaccination views. The article quoted children claiming that their parents think “vaccines are some kind of government scheme” and them having “[fallen] down the conspiracy theory rabbit hole” (Fox, 12.02.2019). The proposed solution was state intervention, as a second instance of authority, seeing as their parents have failed to meet this demand. The idea is that government has the responsibility to help these children. This, in form of legal measures that accept that minors possess the maturity to decide if they want a particular health care treatment.

Interestingly, this reasoning was also based on a type of ‘right to choose’ argument that applies to minors and their right to choose vaccination, as opposed to the previously discussed argument of individuals having the right to *refrain* from taking them. It would be interesting for a framing effects study to test the strength of this culturally held value in different contexts: abortion and vaccination for instance.

The framing was also used in a Fox op-ed, calling for a national vaccine initiative. It conveyed that “vaccine programs are one of public health greatest accomplishments” but that it is a victim of its own success as “today's parents may not understand how devastating these

diseases can be and how serious a threat they pose” (Fox, 14.03.2019). Nevertheless, there was no emphasis on evaluating the parent’s behaviors. Rather, the focus was attributing responsibility to public authorities, which is the logic of the frame. It called on the highest legislative instance of public authority to solve this problem, urging Congress “to provide sustained, predictable and increased funding for a strong public health system and a national vaccine initiative” (Fox, 14.03.2019). A treatment solution was stated.

This is an instance of what researchers have suggested to be most the effective type of personalized frames, as mentioned earlier. Some have suggested that personalized frames that acknowledge the role of the individual, that also emphasize the social determinants and barriers pertaining to the issue, will be most effective in increasing support for evidence-based policies that address these determinants (Gollust et al., 2019).

A report in the New York Times also attended to the issue of mature minor legislation, where the idea of children having the right to choose vaccinations was explicitly referenced. It read that: “[y]oung people are often more conscious about the misinformation on the internet and can in many cases disagree with parents who have bought into unfounded and dangerous anti-immunization diatribes and pseudoscience” and that “[t]hese young people have a right to protect themselves” (NYT, 11.03.2019). It also taps into the idea that scientific recommendations should guide policy, as opposed to pseudo-science guiding some parents.

Thus, both the New York Times and Fox News framing puts forth the idea that parental liberties have to give way to the rights of children in some instances. There were no signs of conflict in the framing, rather, government was understood as one entity toward which citizens can make claims. Research has shown that framing issues in this way can encourage people to see problems as a collective responsibility (Iyengar, 1991).

6.2.2.3. Moral obligation

The *moral obligation* frame conveyed the moral responsibility of citizens to solve the societal problem of non-vaccination. There was clear causal attribution in the framing that held parents responsible for causing the issue of non-vaccination. Moral evaluations of the agents and objects were heavily emphasized, focusing on the consequences that such choice have for other members of the public. The suggested solution was that parents vaccinate their children for the sake of the public health.

Fox News used the frame both in reporting and op-eds. One article rested heavily on emotional appeal, as a way to personalize the issue of unvaccinated children. It was implied

that parents that do not vaccinate their children are affecting other parents and children. A mother's perspective was featured as a way of evaluating the consequences, as the measles outbreak hindered her and her son, sick in leukemia and thereby ineligible for the vaccine, from going anywhere. The mother was quoted, urging parents to "make educated vaccination decisions for the sake of her son and others like him" (Fox, 04.03.2019). A physician perspective was also featured, calling the act of bringing unvaccinated children to a pediatric office "inappropriate," because other patients could "potentially die if they contract one of these diseases" (Fox, 04.03.2019).

Research has shown that it is common in morality framing that journalists have someone else raise the question of how to behave (Semetko & Valkenburg, 2000). This is also the case in the New York Times reporting. In one article a similar situation was depicted, parents of infants were portrayed as being "trapped in a dangerous limbo" (NYT, 02.05.2019) because they could not leave their houses in the midst of the measles outbreak. Lexical choices such as "agonizing" and "acutely aware" used to describe the situation, were understood indicators of the moral evaluation of the consequences of not vaccinating one's children.

Further, moral evaluations were put forth in a more explicit way, by using affected mothers as sources. For instance, a mother was quoted saying "[i]t's not a choice for me, because my baby cannot be vaccinated. The folks who are choosing not to vaccinate their children or be vaccinated themselves are putting my child in danger" (NYT, 02.05.2019). Another mother was quoted saying that she believes "people have gotten a little selfish ... [w]e depend on the community to take care of each other. The babies have no options" (NYT, 02.05.2019). This is a way of conveying that refusal to vaccinate is in fact, an *individual* choice.

Similar to the context of HPV vaccination, the issue of vaccination was personalized by use of this type of framing. The frame was more frequently used in the context of MMR vaccination. The framing builds on the concept of benefit to others as a motivator for the public to vaccinate their children. Researchers have found that parents tend to the role of immunization in building herd immunity in a positive light, although it was mainly a consequence the perceived individual benefits for their own children (Dubé et al., 2013). It follows that if a person does not perceive vaccines as beneficial to themselves or their children, it would perhaps be unlikely that people would vaccinate their children at the benefit of other children. Nevertheless, the threat that measles outbreaks pose to some will likely be a factor in how individuals evaluate vaccines. Researchers have found that a nearly half of the new mothers in that study perceived the MMR vaccines as more important after a measles outbreak (Cataldi et al., 2016).

6.2.2.4. Social disruption – the anti-vaccination ‘crusade’

The frame *social disruption* was specific to coverage on MMR vaccination and featured the anti-vaccination movement, local and global, and its spread of misinformation as the threat to moral order in the US. The main problem definitions in this frame relate to the agitation that the anti-vaccination movement is causing. In that sense, the framing was conflict-ridden, which also characterizes the political conflict framing, but this framing was so focused on the anti-vaccination movement as the causal agents, that it had to be categorized separately. If anything is portrayed as a threat to the cultural authority of science in modern society it is the misinformation and propaganda spread mainly by the anti-vaccination movement. There was a strong emphasis on the problem definition, the causal agent and consequences, and moral evaluations throughout. Thus, it seems the main purpose was to convey a sense of societal threat. In instances where solutions are suggested, public authorities with and without the help of religious leaders are expected to counter the spread of propaganda and promote the vaccine.

Most such frames occurred in the New York Times articles, anti-vaccine parents were called “outsiders” and “well-off bohemians ... who might send their children to Waldorf schools, where an anti-vaccination culture is baked in the warm ovens of so many sprouted-wheat snacks” and Orthodox Jewish parents were claimed to be “resisting incursions of modernity” (NYT, 12.04.2019).

Many outbreaks occurred in Orthodox Jewish communities which are, according to the logic of the frame, victims of the anti-vaccination movements crusade. For instance, the New York Times reported that anonymous persons supported by national anti-vaccine organizations were targeting ultra-Orthodox Jews, “exploit[ing] fear and anxiety within relatively insular communities [...] to undercut scientifically sound warnings from health experts” (NYT, 14.05.2019). Fox News also reported of handbooks filled with “misinformation and discredited science about why it says vaccines are unsafe” that were distributed in tight-knit communities “susceptible to misinformation” (Fox, 29.04.2019) and that “anti-vaxxers” spread misinformation and “stymied” vaccination facts (Fox, 29.04.2019).

Public authorities were put forth as the countermeasure to the spread of propaganda with their strategies bearing potential to halt the spread of disease.

These articles can only be described as multi-faceted. Beyond attributing cause to this specific movement, the consequences of their actions were multiple. The spread of propaganda

had consequences for this particular community and posed a threat to public health as a whole.

Another interesting consequence is the threat that the anti-vaccination movements rhetoric seemed to pose toward the cultural authority of science. Both the New York Times and Fox News noted that vaccine skeptics “cloak their rhetoric with scientific language” while questioning the vaccine (NYT, 09.04.2019) and that “vaccination facts [were] stymied” (Fox, 29.04.2019).

Further, the framing did not portray Jewish communities as the main causal agent. The Jewish communities are depicted as victims of the anti-vaccination movements propaganda and Jewish leaders as frequently used as sources to suggest that they are attempting to “counter the crusade” (NYT, 09.04.2019). Because the outbreaks were centered in Jewish communities, and fueled by *some* Jewish leaders in the communities, there is at least on one level a perceived conflict between religion and science. But as a consequence of attributing responsibility to the anti-vaccination movement, the framing has the potential to diffuse the notion of a perceived conflict between science and religious principles that could otherwise form, by suggesting that vaccination is compatible with religious doctrine. Secondly, it might be understood as an active attempt of the media outlet to diffuse such stereotypes, seeing as the media have been accused of reinforcing harmful stereotypes in general (Nisbet, 2010).

The name of the frame is a reference to the type of framing that was used in a classical study on framing effects of the Ku Klux Klan (Nelson, Clawson & Oxley, 1997). The public order frame portrayed the Ku Klux Klan rally as a significant threat to public order and civic harmony, as a compelling reason for limiting the Klan’s public appearances. Here, the *social disruption* frame was used in a similar way to portray the anti-vaccination movement and its agenda as a threat toward certainties of modern society: the legitimacy of scientific facts, as a reason to stop the movement’s crusade. Following the reasoning of the classical framing study (Nelson et al., 1997), this type of framing might be expected to lower the tolerance of anti-vaccination sentiment or the anti-vaccination movement, as it seems to be disrupting societal fundamentals upon which we rely to make sense of the world, namely, scientific facts. However, it may overshadow the complex and varied political, economic, and social causes of vaccine hesitancy (Capurro et al., 2018). Public shaming is perhaps not the best approach if the goal is to advance the public’s understanding of what causes low vaccination rates and in turn, measles outbreaks.

6.2.2.5. Summary and discussion

Overall, political conflict framing was more prominent in the context of the MMR vaccine, than in the context of the HPV vaccine. In some instances, it seemed the sole purpose of the conflict frame was to convey that the issue of mandatory vaccination involves competing interests, without suggesting a treatment to the problem. In such instances, the public are left with little but the sense of controversy. Also, on that note, the conflict framing involved some discredited claims that if left unattended might be understood as valid concerns in the debate on mandatory vaccination.

For example, Fox News conflict framing contains elements of raising minority voices of parental groups purporting that vaccines are harmful, and their benefits overstated. This perspective is contrasted with references to the scientifically-based recommendations of public health officials but could still have consequences for how audience perceive the issue of vaccination. The tendency may be a consequence of the media's preoccupation of balanced reporting. However, when framing falls into such persistent patterns of journalist practice, it can serve to amplify asymmetrical power by providing coverage to a minority viewpoint (Boykoff, 2007). Keeping in mind that the 'erosion of trust' regarding climate change is in part a consequence of the vocal minority of climate sceptics (Oreskes & Conway, 2010).

Another interesting aspect of the conflict framing is that elite stances were referenced to some extent. Partisan stances in media coverage seemed to play a considerable role in how the public and different ideological groups understood the HPV vaccine (Constantine & Jerman, 2007; Reiter et al., 2011; Gollust et al., 2013). This connection has not been examined in the context of MMR vaccination, to the best of the authors knowledge, but these results might give researchers reason to examine how elite positions affect vaccination attitudes. In fact, some argue that "Trump could have motivated an ideological gap in public attitudes about vaccination" (Baumgaertner, 2018: 3).

Other frames must also be taken into account to provide a complete picture of the way vaccine is are framed. Both Fox News and the New York Times featured the public accountability frame, which promoted legal action to realize the children's 'right to choose' vaccination. According to this framing, parental liberties must give way to the rights of children. What is more, the framing was found in a Fox op-ed that favors national government action to promote MMR-vaccinations nation-wide. This type of framing is expected to prompt considerations of unity rather than polarization and move the issue away from personal causes and solutions to structural solutions. By contrast, morality framing found in both outlets attributed the causes of non-vaccination to individuals as well as the moral obligation to solve it.

Finally, the social disruption frame was found predominantly in the New York Times, and in one of the Fox News articles. It is closely connected to this faceless group of members which might oversimplify the issue of vaccine hesitancy, by blaming and shaming. This frame is most interesting against the background of previous studies showing that interest groups can set the tone of the debate, as did the religious group in the case of the HPV vaccine. Here, in the case of the MMR vaccine, the anti-vaccination movements agenda is thoroughly discredited in the social disruption frame. The threat of the anti-vaccination movement is clearly formulated, and their interests denounced in such a way that it would be unlikely that the audience would consider the anti-vaccination movements interests as a valid perspective on vaccinations.

Taken together, the framing of the vaccine is much more value-infused than the framing of the HPV vaccine, which is cast in more technical terms of scientific and social progress. While there are some indications that the legislative debates may provoke partisan motivated reasoning (alignment with the party position) (Bolsen et al., 2013), the rest of the frames demonstrate a range of different perspectives on vaccination. Public accountability framing promoting the right to vaccination and the need for state action to fulfill these objectives, moral obligation framing promoting the collective benefits of vaccination, and social disruption framing denouncing anti-vaccination sentiment. In all, the vaccine does not seem to be politically contested beyond the legislative debates.

7 Discussion

The following chapter engages in a discussion of the results as well as a general discussion on the study's contributions, limitations and future directions.

7.1 Result discussion

First, this section turns to the frames featured in the media discourse and connects to the first research question: what frames are featured in media coverage on the MMR- and HPV vaccine in the selected online media outlets respectively? The framing was similar in both outlets, although the frequency of each frame may have varied. In the context of the HPV vaccine, four frames were found in Fox News: *social progress*, *scientific uncertainty*, *political conflict* and *professional integrity* and four slightly different in the New York Times: *social progress*, *public accountability*, *moral obligation*, and *professional integrity*. The main difference here was that Fox News featured the frames *scientific uncertainty* and *political conflict*, and the New York Times featured *public accountability* and *moral obligation* instead.

In the context of the MMR vaccine, both outlets featured the same four frames: *political conflict*, *public accountability*, *moral obligation*, and *social disruption*. The main difference was that the political conflict frame was more prominent in Fox News than in the New York Times, while the social disruption frame was more frequent in the New York Times.

Turning to the second research question: how might the framing be understood against the background of an ideological divide in the support for two different vaccines? In the context of the HPV vaccine, frames that mention the political sphere were few. Only the *political conflict* frame in Fox News and the *public accountability* frame in the New York Times mention the political sphere explicitly. Public health researchers and social scientist have expressed hopes that the vaccine would become a routine, or even mundane, component of young adult health care, compared to a public and medial discussion fraught with controversy (Gollust et al., 2016). This is perhaps not entirely the case. It seems that some of the controversial elements of the discussion have lingered in public discourse and are still attended to in the media discourse. More specifically, the *professional integrity* frame is understood as a response to the lingering parental misconceptions that the vaccine could promote riskier sexual behavior. As a whole, the framing was positive of the benefits of research.

In the context of MMR vaccinations, frames that mention the political sphere were predominant. Conflicting political positions and competing arguments were most accentuated in the *political conflict* frame. The *public accountability* frame also made claims toward political actors to act in the public's interest, and so did the *social disruption* frame to some extent. In that sense, it seems the MMR vaccine and vaccination are subject to more political attention and political framing than the HPV vaccine. In particular, the *political conflict* frame indicates that some political elites are polarized in their stances on mandatory vaccination, which at least has the *potential* to affect views on vaccination laws (Bolsen et al., 2014b). Research has found that in polarized environments, partisans tend to move in the direction of the stance endorsed by their party (Bolsen et al., 2014b). It remains to be examined if false statements from individual legislators, such as the one about antibiotics curing measles (NYT, 06.03.2019), would have any tangible effect on the public's attitudes toward the vaccine.

Further, some different public perspectives on the vaccine and vaccination laws were put forth in the frames, but these cannot be assumed to reflect the general populations attitudes toward the issues. Some frames put forth parental groups voicing concerns of the infringement on parental liberties and the safety of the vaccine, but they were portrayed as being in minority. Other frames featured members of the public urging others to vaccinate their children, in addition to frames that depicted the willingness of minors to achieve vaccinations on their own. The 'facelessness' of the anti-vaccination movement made it difficult to identify the group and their actual motivations for resisting vaccines, but it cannot be assumed that they are driven by an ideological agenda based on the information in the articles.

In all, the *political conflict* frame indicates that the issue of mandatory MMR vaccination prompts concerns of ideological character, e.g. limited government regulation, freedom religion and individual liberties. Conversely, the *public accountability* frame and *moral obligation* frame emphasized the importance enabling vaccination and vaccinating children for collective benefit. Thus, framing or frame building studies focusing specifically on (1) the distribution of political and moral arguments for and against the vaccine and/or mandates (2) the position of actors regarding the potential action, and subsequent framing effects studies, will want to examine if the issue of MMR vaccination is morally or politically charged to a level of sufficient momentum that could turn the vaccine risk perception controversy into a proxy for moral or political contentions among members of society (Song, 2014).

7.1.1 Summary of results

In Table 1 below, the level of abstraction of the frames was raised further than in the analysis considering that scholars tend to operationalize frames in different ways (Vliegenhart & van Zoonen, 2011) especially in content analyses compared to experimental studies. Thus, the typology below will allow for researchers to study how public health issues are framed in the media while also allowing for experimental studies to operationalize these frames in studies of media effects. The first six frames are assumed to be generalizable in across public health issues. The last one, *social disruption*, might be valuable in studies examining discourse on the anti-vaccination movement in particular and social movements in general.

Table 1.

Frames that appear in media discourse on vaccines and vaccinations

Frame	This frame...
Social progress	... is enthusiastic about research progress and health benefits for the public.
Scientific uncertainty	... acknowledges the inherent uncertainty in the scientific process and calls for further research.
Professional integrity	... calls for action of health experts, as representatives of scientifically grounded conduct, to improve individual/public health.
Public accountability	... calls for action of public officials/legislative bodies, to improve public health.
Moral obligation	... emphasizes the moral duty of citizens to take individual action at the benefit of others, for the 'public good.'
Political conflict	... cast the issue as a matter of conflict between groups and/or elites (e.g. Democrats and Republicans battling over legislation; legislators and interest groups with competing claims).
Social disruption	... portrays a social movement as a deviant group, a threat to status quo, with invalid, disruptive and unscientific claims.

7.2 General discussion

Media frames might help set the terms for how citizens understand issues, but they are not expected to exclusively determine public opinion (Nisbet & Scheufele, 2009). The media is unlikely to be the most important factor in shaping public views on vaccines, for instance, research supports the importance of provider recommendation in influencing vaccine decisions at the individual level (Gollust et al., 2016). Even so, clinicians, public health researchers and

social scientists will have an interest in how these issues are framed in the media, since the media also shape how members of the public think about public health issues (Gollust et al., 2016; Krakow & Rogers, 2016).

Entman's (1993) definition of media frames used in this report was fruitful in some instances, while it seemed to reduce the complexity of an article in other instances. Longer, more intricate articles seemed to involve multiple frames. Thus, assuming that articles contained a single frame structured around the organizing principle, may have forced a format upon the articles that reduced their complexity.

Moreover, it became clear that some frames are more suitable for indicating the origins of an issue, and others the consequences, or causal agent and so on. One main take away from the applying of this frame definition, is that in the context of disease and medical research, not all frames define the issue as problematic. The frame element 'problem definition' seems to imply that there is a negative bias in media coverage. Health scholars and other commentators on the media, including health professionals, tend to assume that journalist have a preference for negative news, controversy and conflict (Briggs & Hallin, 2016). But this is only partly true.

Scholars that operationalize Entman's (1993) definition of frames, should be aware that the cause of an issue could be defined as natural (caused by environmental circumstances) or neutral (no specific actor attributions of blame) (Kensicki, 2004). On that same note, scholars should acknowledge that evaluations can be positive, negative or even neutral, that is, neither clearly positive nor clearly negative, to reach better evaluations of media frames (Matthes & Kohring, 2008).

7.2.1 Contributions

The results speak to the importance of the policy cycle and framing cycle for media framing (Nisbet et al., 2003; Nisbet & Huye, 2006; Fowler et al., 2012), although it did not track the coverage chronologically. Nevertheless, the MMR-vaccine and vaccinations were understood as being in an overtly political arena, which seemed to involve a diversity of actors granted access and input (Nisbet & Huye, 2006). The intensity of competing interests and conflict were also more pronounced in the coverage of the MMR-vaccine. Conversely, the HPV vaccine was understood as being in a more technical stage of the policy development in which few actors are generally granted access to the media (Nisbet & Huye, 2006). This was demonstrated by the fact that scientific perspectives dominated, highlighting research development, and that physician responsibility was emphasized.

Scholars that have researched the development and prevalence of controversy and conflict in the framing of the HPV vaccine (Fowler et al., 2012; Fowler & Gollust, 2015) will be interested to know that, judging from this sample, the HPV vaccine was not subjected to this type of framing to any large extent. On the other hand, the MMR vaccine was subjected to more political elements in framing, including elite positions on the issue of mandatory vaccination and to some extent the vaccine itself. Future studies will want to follow up on how the coverage of the issue progresses and what effects elite positions on the issue might have for public perceptions.

Further, it provided insight to the workings of the news production. In the absence of powerful political and social actors pushing a frame, the media had to rely common ways of portraying an issue. For example, in the context of HPV vaccine, the media had to rely on the actors were engaged with the issue at that point in time, namely, science actors.

Finally, a main merit of this study is that it can formulate the focus of future research and determine the feasibility of conducting research in this way. Some suggestions have already been lifted and will be discussed further in a following section. Hopefully, the typology can provide some guidance for future studies in approaching how public health issues are framed in the media.

7.2.2 Limitations

As with any academic study, this study has limitations which must not be left unacknowledged. The small sample size is undoubtedly the largest limitation of this study. As aforementioned, small samples and case studies do not allow for strong generalizations (Matthes, 2009). It follows that these results cannot speak for the national media discourse on these issues during these periods. The small sample will plausibly explain why few politically-oriented frames were found in the context of the HPV-vaccine. This goes for the infrequency of the *scientific uncertainty* frame as well. As mentioned, scientific uncertainty is a part of the scientific process and will likely be a part of media discourse as well. The prevalence of promotional science frames could be a consequence of that fact that the issue was not subjected to political attention. However, if one would look at the period of 2015 when legislation was enacted, one might find more coverage of political debates and conflicts. Furthermore, political conflicts in media coverage is likely to be determined by proximity. Meaning that if one would look specifically at local media during the time of Rhode Island legislation, competing interests and political

conflicts might be more prevalent. By consequence, the author is reluctant in making any wide generalizations about the national media discourse.

Further, the Fox News online does not seem to have the same spending or general assigned effort as the Fox News cable network, which has been the primary research subject of conservative media (Baum, 2011, Feldman et al., 2012). This assumption is based on the fact that many ‘articles’ were in fact television transcripts of host cable shows, which was excluded from the corpus. More importantly for the results of the present study, the online news website indexed a significant number of articles from other large news organizations such as *Reuters* and *Associated Press*, along with science news from *Live Science*. These articles were kept in the sample guided by the rationale that including these perspectives was a conscious choice by the news organization. Additionally, this is the actual real-world content to which consumers are exposed upon reading Fox News online. It does not reflect framing by Fox journalists representing the organization, however. The fact that indexed articles account for most of outlets coverage of the HPV vaccine will affect the conclusions that can be drawn regarding the of these articles. The answer to why such content was indexed, and specifically regarding the HPV vaccine, is only for the author to speculate about. It is assumed, however, that the news events pertaining to the HPV vaccine were not deemed particularly newsworthy or ‘Fox-frame-worthy.’ That said, the indexing did render a lot of *social progress* frames which highlight the benefits of the vaccine.

Moreover, the method for uncovering frames may have obscured some relevant aspects of the articles. The article was treated as the unit of analysis, but from a theoretical perspective it seems more reasonable that there are several frames in an article (Matthes & Kohring, 2008). If frames are conceptualized as strategic views on issues put forth by actors, there most certainly can be different frames in a single article (Matthes, 2009). This is perhaps a more fruitful approach to studies of media discourse by capturing political positions and salient argument in the debates.

Finally, there are both advantages and limitations in labeling the frame in the same as previous studies, especially when the applied method here is inductive. The rationale for labeling the *social progress* frame the same way is, of course, that the defining elements of the frame overlapped. The main advantage in using the same name then, is avoiding ‘reinventing the wheel’ as scholars have a tendency to do so in identifying frames that exist in any debate (Nisbet, 2010). While the main disadvantage is that it may affect the perception of validity of the inductive approach.

7.2.3 Future directions

Building on these specific results, future studies will want to test if media frames during periods on low political contestation has the power to promote personal opinion change on issues that may have been influenced by political predispositions. Take the social progress frame for instance. Previous research has found that an operationalization of the social progress frame in an experimental study that emphasized evolutionary science as a building block for medical advances was the most effective frame among publics that were hesitant about teaching evolution in schools (Nisbet, 2009).

Scholars have already tested the effects of political conflict framing on public support for HPV vaccination (Gollust et al., 2010). But considering that political conflicting was present in the sample of MMR vaccination, future studies will want to test the effects of a political conflict frame or “controversy frame” as the scholars referred to it also in this context, by presenting information indicating that MMR vaccine policies are controversial (Gollust et al., 2010). Building on this, effects studies might also want to include frames with partisan cues (i.e. particular partisan information sources), as citizens tend to interpret politically charged health issues heuristically (Bolsen et al., 2014b). But before that, as mentioned, frame building and framing studies will want to look specifically and more systematically at; the distribution of political arguments for or against the vaccine mandates; and the position of political actors regarding the potential action.

In general, future efforts should continue to track the evolution of the framing of the MMR-vaccine and the HPV-vaccine in the media, by looking beyond online news media. Television, for instance, is still an important source for news in the US, that contributes to public health practice and outcomes (Gollust, Fowler & Nierdeppe, 2019).

If the aim of future studies is to examine the information environments that might lead to ideological differences in attitudes toward vaccines, it might be fruitful to look at social media consumption. More specifically, Facebook groups that spread misinformation, or websites that provide misinformation. Studies have shown that social media propagate vaccine conspiracy theories and can exert a large effect on people’s world views (Featherstone, Bell & Ruiz, 2019). In this context, conservatives were more likely to report consumption of social media to obtain information about vaccines (Featherstone et al., 2019).

Notably, there is recent evidence of a link between conservative news consumption and holding inaccurate beliefs about the MMR vaccine (Stecula, Kuru & Jamieson, 2020). Future efforts will want to examine the content differences between the examined conservative

news sources identified in that particular study: Fox News, Rush Limbaugh, The Drudge Report, and The Mark Levin Show (Stecula et al., 2020).

Finally, future studies should examine how political predispositions and media exposure influence *actual* vaccine uptake. Given political differences in the uptake documented for the swine flu vaccine (Baum, 2011) more research is needed in other samples. Especially, as vaccination uptake remains low in the case of the HPV vaccine.

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