The health of a democracy and its people: How does misinformation affect health and political participation?

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The health of a democracy and its people: How does misinformation affect health and political participation?

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1. Introduction

The highly political nature of public health matters can be observed through many examples, one of which dates back to 1848, when the pathologist Rudolf Virchow was asked to investigate the typhus epidemic in Silesia, a region that nowadays lies mostly in Poland. He reported that the root of the epidemic could be found in the unequal distribution of economic and political power in the area. In result, Dr. Virchow proposed political reforms to promote equity and improve living conditions for the poorer classes. The authorities took personal offense in this political approach to the matter and disregarded it after banishing Dr. Virchow from Silesia (Daher-Nashif, 2021). Since then, the political approach to public health issues has become less of a risqué undertaking for experts. Nowadays, it is a more commonly accepted fact that public health and politics are intertwined, seeing as health can both affect and be affected by politics.

A more recent example that demonstrates the relationship between public health and politics is the 2020 Covid-19 pandemic. The fast spread of the virus presented itself as an unprecedented challenge to the governments in power. This public health issue was very political in nature because it forced world leaders to choose between widespread disease with a high death-toll and economic shutdown. Furthermore, the pandemic prompted governments to implement strict national policies that drastically changed the lives of their citizens. In turn, these adjustments have been found to influence the public, their political views and political participation. For example, Bol et al. (2021) conclude that the strict confinement rules that were enforced in response to the pandemic actually corresponded with higher levels of trust in government and satisfaction with democracy, alongside an increase in vote intention for the party of the incumbent Prime Minister/President.

The Covid-19 policies that were implemented also sparked many political debates among the population regarding their ethics and effectiveness. In these debates, misinformation played quite a large role (Roozenbeek & Schneider, 2020). Online media was an important medium of communication during the pandemic, but it also facilitated the fast spread of misinformation (Muric et al., 2021). The speculation and fake news online played right into the lack of empirical experience with the virus (Ohme et al., 2021) and fuelled the discussion around vaccines, face masks, and other preventive measures.

However, the Covid-19 pandemic is not the first public health issue to fall victim to misinformation. To this day, the antifluoridation movement has an active following online that does not approve of the fluoridation of drinking water. It is interesting that such a movement still exists, despite the longstanding scientific consensus on the safety and efficacy of fluoridation in preventing tooth decay (Seymour et al., 2015). Another medical issue that suffers from misinformation, especially in more conservative or religious countries, are STD's. It is a lesser discussed and often even taboo topic. Because of this, correct preventive measures are not commonly known, which can gravely affect the health of the population and lead to higher levels of infection, in particular among teenagers and young-adults (Oluyemi, 2015). A well-known example that further highlights the possible negative effects of misinformation regarding health matters, is vaccine hesitancy. Despite the established successes of vaccinations in reducing the prevalence of infectious diseases and sometimes even eliminating them fully, they have been increasingly targeted by misinformation claiming the opposite. The consequences of these developments can undermine the effects of herd immunity, as a decrease in vaccination rates would allow for infectious diseases to spread easily and thus, decrease the health off many (Dubé et al., 2013).

A decrease in the quality of health has been proven to go hand in hand with a decrease in political participation. A growing body of work shows the crucial role that health plays in

enabling the necessary time, money and mobility to participate (Burden et al., 2017, Gollust & Haselwerdt, 2019; Gollust & Rahn, 2015; Haselwerdt & Michener, 2019; Schur et al., 2002). For instance, an individual suffering from disability or illness has less opportunity and independence to go out and vote or join a protest.

The interaction between misinformation and its effects on public and individual health has been increasingly looked into (Carey et al., 2020; Chou et al., 2018; Chou et al., 2020; Lee et al., 2019; Vogel, 2017). In light of the recent Covid-19 pandemic some authors have taken on the question of how different health policies and perceived levels of misinformation affect political participation and attitudes (Bol et al., 2021; Ohme et al., 2021). The results that they find however, leave the question of whether these effects can be generalised outside of the pandemic, as lockdown measures differ vastly from what everyday life looks like after. Furthermore, the fact remains, that it is not an extensively researched topic. Additionally, existing work does not examine the relationship between holding misperceptions and its effects on participation through the worsening of health.. To fill this information gap this thesis will research this area through the following question:

What is the effect of misinformation regarding health on political participation?

To investigate this relationship this paper conducts a linear regression analysis using survey data from the United states. The findings from this statistical analysis show that while controlling for age, gender, disability, having children, survey mode, education, and ethnicity, being misinformed on health has a negative effect on political participation.

2. Theory

Political Participation

The demos in a democracy, and their participation even more so, are crucial for the system to function. The extent to which a population participates however can vary. An approach to explaining this variance that has been widely employed is the use of the socio-economic (SES) model. In this approach scholars such as Lindquist (1964) identify the socio-economic status of an individual as a predictor for their political participation. A higher socioeconomic standing is related to higher participation levels in the political sphere. To explain this relationship other scholars look at what might lie beyond the SES model. This can be illustrated by how an individual with a higher SES receives a higher quality education, which in turn allows them to develop civic skills that improve their political sophistication and participation. Brady et al. (1995) look behind the SES theory by investigating how certain resources that they deem necessary for political participation, differ among socio-economic groups. In their research the authors conclude that time, money and civic skills are attributes that are of great importance for political activity. Furthermore, Brady et al. (1995) find the resources to be distributed in such a way, that explain the relationship between a higher SES of an individual and higher levels of political participation. The definition provided by this work will be further used in this study to conceptualizee political participation, as it is often used in other research that includes health in relation to political participation (Haselwerdt & Michener, 2019). The aspects of political participation that will be taken into account in my research are ‘giving time, donating money and voting’ (Brady et al., 1995, p. 271).

Alongside with SES, motivation has been explored as a predictor for political participation. Individual motivation has been found to be an important factor that stimulates one to engage politically. The identified incentives are very diverse and include expression of

personal values, the acquiring of further knowledge, and sense of community (Omoto & Snyder, 1995). Furthermore, the cost of politically participating has been found to be of influence (Paler et al., 2018). For instance, political action such as signing a petition or protesting can be motivated or discouraged through social pressure. Many other underlying explanatory variables have been researched and identified for political participation. For example, news consumption, (Moeller et al., 2014), social norms (Shulman et al., 2017) or religion (Mclendon et al., 2019) have all been found to influence the political involvement of a population as they affect the knowledge and environment of an individual, which in turn influences their motivational drives.

Misinformation

With the rapid development of technology, the spread of information and data is easier and faster than ever. Studying these novel processes is of great importance, as they change the manner in which humans communicate and process information. Researching these developments can reveal processes that help better understand political participation because according to some authors, information is a crucial element of being politically engaged. For instance, Wolfsfeld et al., (2016) establish that individuals who are interested in politics, have a higher chance of developing vast political information repertoires. These in turn have been found to better allow said individuals to be politically engaged. Goldstein (2020) in particular emphasizes the importance of being informed to be able to effectively participate in a democratic society. According to the author, the act of being politically engaged in itself is underpinned by being able to reach an informed viewpoint regarding a certain topic. An example of the significant role that information plays in promoting participation can be observed from an example provided by Martzoukou (2020). This work shows the way in which public libraries in Scotland help refugees from Syria build up their knowledge. This then promotes their capacity to actively contribute and participate in the new environment they come

to live in. In the context of social media similar findings have been presented. Beam et al. (2016). The authors show how information shared and posted by family and friends promotes further seeking of information among social media users, which consequently increases their political engagement.

However, the fast spread of information has consequences for the quality and truthfulness of the information that people consume online, as technological advances simultaneously facilitate the dissemination of misinformation (Muric et al., 2021). Online platforms such as Facebook are full of unchecked facts on a wide array of topics. What also makes these changes in communications notable is the fact that the public plays an active role in producing, accessing and spreading information (Waisbord, 2018). An event that illustrates both the prevalence of misinformation and the role that the public played in spreading it is the 2016 presidential election in the United States. During this time the circulation of fake news on social media had a significant impact on voters (Grinberg et al., 2019).

To understand the dynamics of misinformation it is necessary to establish a definition what misinformation is. A commonly used definition is offered by Southwell et al. (2018). This work describes misinformation as a type of claim which is contested about whether it is truthful while judged by the widest possible range of observers. In essence, misinformation regards claims that are not accurate, certain, ambiguous or vague and are not accepted as factual by the majority of societally accepted evidence adjudicators.

Aside from a definition of misinformation, it is important to be a aware of how people treat new knowledge. Human beings are not as rational as we might believe ourselves to be and there are complex underlying processes at work when being presented with new information. One of these processes that is necessary to take into account when analysing misconceptions is directionally motivated reasoning. This concept addresses the tendency of people to seek out

facts that enforces their existing beliefs and opinions (Flynn et al., 2017; Jerit & Barabas, 2012). This dynamic can be magnified by social media algorithms which ensure that users are being presented with pre-selected content that fits their perspectives and beliefs. Users can then fall into an environment in which constantly reinforces their opinions and political beliefs, that is, an echo chamber. The amplification of humanity's innate perception bias poses an important challenge to correctly informing the public and preventing polarization (Cinelli et al., 2021).

Despite these well documented effects of increased accessibility and algorithms, the actual extent of exposure to misinformation is disputed. Some studies find that people from older age groups and conservative leaning individuals are more susceptible to online misinformation and are more likely to engage with it, thus increasing exposure within this demographic (Grinberg et al., 2019; Guess et al., 2019). The root of this issue can be deduced from the fact that older generations lack the level of digital media literacy that is required to discern trustworthy online sources from unreliable ones (Guess et al., 2019). Other research however argues that to fully grasp exposure to misinformation online, non-contextual content needs to be examined (Chou et al., 2020). The internet is an environment in which allows information to travel in many different forms such as images, memes and videos and these are often disregarded. The same can be said about online platforms. There are still many different platforms, websites and forums that remain understudied but are being used by millions, especially by younger generations, and studying these might offer novel insights (Chou et al., 2020).

Misinformation clearly has the ability to shape and change belief systems of human beings, so how does this affect political participation? This question has yielded different views. On one hand, misinformation is largely seen as a hindering factor for political participation. High levels of misinformation have been found to negatively affect the quality of informed political discussion, trust in media and trust in political systems which

subsequently reduces the extent to which people are inclined to participate (Bennett & Livingston, 2018). Together with this, exposure to misinformation has been related to higher levels of political cynicism which is generally thought to reduce people's engagement in politics (Lee & Jones-Jang, 2022). On the other hand, some authors find that perceived high levels of exposure to misinformation are found to actually be associated positively with political participation, especially when it comes to online activities such as actively posting about political topics (Ahmed et al., 2022). This effect is particularly strong among older age groups.

Similar findings are also observed by Ohme et al. (2021), who research the relationship between holding misinformation beliefs and political participation during the early stages of the Covid-19 pandemic in the Netherlands. The authors conceptualize political participation as a lists of behaviours that holds similarities to what Brady et al. (1995) propose in their work with the SES model. Their used definition is however slightly augmented to fit the reality of the pandemic, as the actions had to be realistic to engage in during the initial weeks of the pandemic and thus are mostly based on giving time and money. The behaviours included volunteering, donating money or goods, expressing public opinion and promoting social causes. The study interestingly concludes that perceived higher levels of misinformation regarding Covid-19 corresponded with more participation among the respondents. A possible explanation offered is that the more uncertainty and doubt people see surrounding the pandemic, the more it is perceived as a crisis, and the more they are willing to act upon it. The study however, despite adjusting the participatory measures to the pandemic, does not take into account that the strict confinement measures that were implemented because of the pandemic. Staying at home during the first lockdown, shops, restaurants and venues closing could have significantly affected the time and money that citizens had to spare for political participation. Lockdown measures also influenced the spread of other diseases as the lockdowns made sure

people had as little contact as possible. This could have notable effects on political participation as health has been found to play an important role in research regarding political engagement.

Health and political participation

In recent years, even pre-pandemic, health has been increasingly explored as a predictor for political participation and is proven to be quite significant. As mentioned in the introduction, public health and politics are intertwined and there is a growing body of research that provides proof of this relationship and illustrates the importance of health of the people for participatory behaviour. Some even go so far as to state that the impact that health is found to have on political participation actually might rival the previously observed effects of socioeconomic predictors such as education and income (Burden et al., 2017). An interesting result that studies on the topic have established is the effect that disabilities (Schur et al., 2002) and diagnoses of certain illnesses (Gollust and Rahn, 2015) have on voter turnout. Both have been confirmed to reduced likeliness of voting compared to individuals who do not face mobility limitations or are in good health. Furthermore, health factors appear to influence political outcomes as well. For instance, research has shown that areas in the United States with shorter life expectancy had the tendency to increasingly vote for Trump in the 2016 election (Gollust & Haselwerdt, 2019).

An interaction that is also often pointed out when it comes to the relationship between health and political participation, is policy feedback (Gollust & Haselwerdt, 2019, p. 342). Not only can the health of a population affect their involvement in participatory activities and political outcomes, but public health policies can also affect and change the behaviour of the people. A straightforward example of how this can be observed is government involvement in tobacco use. Since smoking has been linked to a higher risk of cancer, governments have

successfully attempted to reduce smoking among their citizens through many different measures. The same can be said about obesity. Both are issues that developed from being a private matter to needing government interference when they became a threat to public health (Daher-Nashif, 2022). The influence of policy changes on the public and their health can reveal interesting dynamics in the political sphere. For example Bol et al. (2021) uncover the effects of the enforcement of strict lockdowns during the Covid-19 pandemic. Their research shows that the ability of governments to implement drastic measures which prioritised the health of the population and ensured the safety of vulnerable citizens increased the trust in government and satisfaction with democracy.

Policy feedback has also been analysed in regard to political participation. Haselwerdt and Michener (2019) explore the effect of changes in public health insurance policies in different counties in the United states. They do this by linking public health back to the SES model and follow the resource focused interpretation of this model by Brady et al. (1995). As mentioned before, this approach proposes that for citizens to participate politically, they require the necessary resources to do so such as time, money and civic skills. The Haselwerdt and Michener (2019) article then argues that change in health policy redistributes these resources in such a way, that affects political participation. They find that higher levels of insurance coverage allows citizens to have more time and money to politically participate and evolve their civic skills, once more proving that the health of an individual needs to be taken into account when exploring the facets of their political participation.

Misinformation in health

A relationship that however has not been researched much, is the effects of misinformation on health in regard to political participation. Despite this, it is a connection

worth exploring as it has been proven that in areas such as health, misinformation can have severe consequences for the health of a person. Despite these known consequences, matters of public health have long suffered from misinformation. For instance, vaccine hesitancy dates back to the 1800s, when vaccines were a novel discovery. Due to a lack of verified proof of effectiveness and scientific consensus, they were met with scepticism and many did not believe the treatment would be successful (Muric et al., 2021). This effect can be particularly strong during early stages of public health crises such as a pandemic, as can be observed during the 2020 spread of Covid-19 (Ohme et al., 2021). In literature on the topic, misinformation in the area of health is usually conceptualized as "a health-related claim of fact that is currently false due to a lack of scientific evidence" (Chou et al., 2018, p. 2417).

There are of course may more examples of cases where misinformation plays a role in deteriorating health. For instance, poor knowledge and incorrect facts on the practice safe sex as a preventive measure, causes teenagers in Nigeria to be exposed to be unnecessarily exposed to sexually transmitted diseases (Oluyemi, 2015; Carey et al., 2020). The failure to protect oneself from disease as a result of misinformation have been a major concern during outbreaks such as the Zika epidemic in Brazil and Ebola outbreaks in West Africa (Carey et al., 2020). This can have detrimental effects on public health as a whole.

As with information and misinformation generally, technological advances have accelerated and simplified the dissemination of misinformation in the field of health. There been distinct changes in the sources of health information since the introduction of the first vaccines. In the past, medical advice was traditionally spread by experts (Di Sotto & Viviani, 2022). But with nowadays 8 of 10 people turning to the internet for medical advice (Vogel, 2017), scholars stress the importance of researching incorrect medical information online and the influence of social networks and finding ways to counter it (Seymour et al., 2016). This is critical, as the vast exposure to misinformation has been linked to less engagement in

preventive behaviour that protects an individual's health (Lee et al., 2020). An example of this, is the trend among parents to opt out of vaccinating their children. Since the publication of an article by Wakefield in 1998 falsely reporting a causal relationship between vaccinations given to children to prevent the measles, mumps and rubella and autism, the myth has continuously circulated online despite multiple studies proving it wrong (BMJ, 2011).

The effect of misinformation regarding health on political participation

The effects of misinformation on political participation have been quite extensively researched but with outcomes that show evidence for both an negative and a positive relationship. Research that is conducted on this topic however, has left out health as a mediating factor in this equation, and this study aims to fill this gap. The negative effects that misinformation has on health has been a longstanding issue and has been well documented (Oluyemi, 2015; Carey et al., 2020; Lee et al., 2020; Muric et al., 2021). Furthermore, the importance of good health for a citizen to be able to participate in a democratic system has recently been established to be quite significant (Schur et al., 2002; Gollust and Rahn, 2015; Burden et al., 2017; Gollust & Haselwerdt, 2019). If then the example of Haselwerdt and Michener (2019) is followed in using the resource model by Brady et al. (1995) to analyse political participation, it is to be expected that individuals who are misinformed on topics regarding health will have lower quality of health and subsequently will participate less politically. The lower quality of health will take up the resources of this individual and leave less time and money to spend on learning, donating, protesting and voting. This study thus states the following hypothesis:

H1: Individuals who are misinformed on the topic of health will participate less politically.

3. Research Design

Case Selection

In order to analyse whether the influence of health misinformation on political participation can be established, a within-case, survey-based analysis is the most suitable approach. In this situation, a within-case study should be interpreted as an analysis conducted within a country. This will allow the thorough analysis of the necessary elements of an individuals' beliefs and actions. As this is the first research looking into this relationship, it is of importance to first explore the possible existence of the phenomenon within one country before attempting to find generalisable patterns across cases. Commencing this research by comparing respondents from, although possibly similar, yet unidentical political systems might pose problems to researching the existence of the phenomenon.

Several factors should be taken into account in this research. Firstly, to measure political participation the survey used in this thesis should be conducted in a political system that allows democratic participation that. If this is not the case, the measurement of participatory activities cannot be seen as significant. Secondly, there should be free media access for all citizens, whether this is media spreading misinformation or not. Countries that are known to spread propaganda or purposefully misinform their citizens cannot be used as no comparison can be made with citizens who are not misinformed. Finally, this thesis aims to explore this relationship outside of Covid-19 pandemic repercussions. For this reason, the survey utilised in this research should include measurements that stand detached from the pandemic.

Based on these criteria, the United States in 2020 was selected. The aforementioned characteristics generally allow for many countries to form a potential case, but a crucial detail of picking a country, is the availability of data. The measurement of both participation and

health misinformation is not often found within the same survey and the American National Election Survey (ANES) 2020 survey provides exactly that, which is why it has been selected to be used in this study. Moreover, the survey contains questions regarding the behaviour of the respondent before the pandemic.

Data

The ANES 2020, is part of a continued series of studies that have been conducted since 1948 to facilitate the analysis of voter behaviour and public opinion in U.S. presidential elections and asks a wide variety of questions to American voters regarding participatory activities as well as misinformation on vaccines and Covid-19. Data is collected in two waves, pre- and post-election, and potential respondents are approached through three different channels. Firstly, a sample of respondents from all 50 states are contacted through address-based sampling using the US Postal Service Computerizes Delivery Sequence File. Secondly, the sample includes re-interviews of individuals who took part in the ANES 2016, which is the predecessor of the 2020 version. Lastly, respondents from the 2020 General Social Survey are also recruited to participate in the ANES 2020. All participants were initially approached by mail or email. The survey then makes use of multiple ways of data collection, namely self-administered web questionnaires, telephone interviews and video interviews. The sample (N ca. 8000) that this approach yields is largely representative of the portion of the U.S. population that is eligible to vote.

There are however certain concerns that can be raised with the ANES 2020. Not interviewing respondents face-to-face but by telephone when it comes to long questionnaires, can potentially affect the answers they give because of social desirability bias and satisficing (Holbrook, Green & Krosnick, 2003). This causes respondents to answer questions more quickly and less carefully when being presented with a long questionnaire that is being

conducted through the telephone. Furthermore, respondents are more inclined to give socially acceptable answers, which leads to the over-reporting of socially desirable behaviour in telephone interviews (Halperin & Heath, 2017). The data from the ANES 2020 could potentially underestimate the amount of people that are believe that vaccines cause autism, if the respondent is aware of the fact that this is not a generally accepted fact. Similarly to telephone interviews, video interviews have been found to be inferior to face-to-face interviews because respondents tend to give less detailed and informative answers (Krouwel, Jolly & Greenfield, 2019).

There are two advantages of using the ANES: the extensiveness of the questions and timing of the questionnaire. Despite the fact that the survey was conducted during the pandemic, it entails a wide variety of questions that take into account events that might have taken place despite or outside of the pandemic. The survey does not solely focus on participatory behaviour during the pandemic, but also asks about previous elections and events taking place before lockdowns. Furthermore, as opposed to the predecessor of the 2020 survey, the 2016 edition, the latest version of the ANES contains more questions about misinformation regarding health. Additionally, because of the timing of the survey, the possible side-effects of vaccines were an actively discussed topic. Because the ANES 2020 is conducted during the pandemic, respondents are more likely to be engaged with information (or misinformation) regarding vaccines and health.

Variables

The dependent variable in this study is political participation. Because of the conceptualisation of political participation as giving time, donating money and voting by Brady et al. (1995) that this study follows, the dependent variable is measured by four different variables that are coded into one single index variable which ranges from zero actions

performed, to all four actions performed. All variables are measured post-election. The first variable included asks whether the respondent voted in the 2020 election. The second and third variables ask if the respondent has contributed money to either an individual candidate running for public office, or a political party during the election year. Lasty, the fourth variable asks whether the participant has joined a protest march, rally or demonstration in the last 12 months. All four variables are coded as yes or no questions. In the case of an affirmative answer, the variable is coded as 1. If the participant responds with no, the answer is coded as 0. A descriptive analysis shows that 53% of respondents reports participating in one out of four actions, 1.8% took part in two actions, 9.7% participated in three and 1.7% of respondents reported having done all four actions. The mean of these results is 1.230, with a standard deviation of 0.913.

As a predictor for these participatory behaviours this study will utilise a variable that poses the respondent with the following question:

Does most scientific evidence show vaccines cause autism or not? (Mean = 0.975, SD = 0.297)

To this question 8.5% of respondents gave an affirmative answer, and 78.9% answered with no. Out of the participants 1.3% refused to answer this question. There are also multiple variables on Covid-19 in the dataset, however, these will not be included in the analysis as one of the goals of this study is to check whether the results in this field that have been found in relation to Covid-19 misinformation are generalisable. The belief that vaccines cause autism have been around for quite some time, and can be traced back to a fraudulent medical article from 1998 (BMJ, 2011). It has since been proved to be false on many occasions, but the myth continues to exist, which is why it is plausible that using this variable will provide with more generalisable outcomes. The advantage of the time period during which this survey was

conducted is the fact that the pandemic sparked the debates on vaccines. Due to this people were more engaged with the theme which expectedly might lead to more people having a stronger opinion on the topic.

Model

The statistical model that best fits the analysis of the sum of four variables that the dependent variable in this paper consists of is a linear regression. To ensure the internal validity of the model, several control variables need to be added. Firstly, some sociodemographic factors such as age, sex, ethnicity, and education are added to the model. These are all variables that are commonly included in political science research (Kellstedt & Whitten, 2018). Aside from this, age and education are included in the model for additional reasons. Higher age groups have been found to be more susceptible to misinformation (Grinberg et al., 2019; Guess et al., 2019), and education has been extensively researched as a predictor for political participation (see for example: El-Said & Rauch, 2015; Print & Milner, 2009; Croke et al., 2016; Walter & Rosenberger, 2007). In the dataset, age is coded in years of age, and respondents with ages of 80 and above are all coded as "80" (Mean = 51.59, SD = 17.21). As for education, this variable is split into nine dummy categories with the following educational levels:

1 = less than high school credential (Mean = 0.046, SD = 0.209), 2 = high school graduate (Mean = 0.162, SD = 0.368), some college but no degree (Mean = 0.204, SD = 0.403), 4 = associate degree in college – occupational/vocational (Mean = 0.075, SD = 0.263), 5 = associate degree in college – academic (Mean = 0.060, SD = 0.237), 6 = bachelor's degree (Mean = 0.249, SD = 0.433), 7 = master's degree (Mean = 0.144, SD = 0.351), 8 = professional school degree (Mean = 0.049, SD = 0.217) and 9 = other (Mean = 0.012, SD = 0.108).

Ethnicity is coded in the same manner, with six categories which allow the respondent to select their ethnicity as:

> 1 = White (Mean = 0.729, SD = 0.444), 2 = Black (Mean = 0.089, SD = 0.284), 3 = Hispanic (Mean = 0.093, SD = 0.291), 4 = Asian/Native Hawaiian (Mean = 0.035, SD = 0.183), 5 = Native American/Alaskan (Mean = 0.021, SD = 0.144) or 6 = Mixed race (Mean = 0.033, SD = 0.179).

The sex of the respondent is coded as 1 for female, and 0 for male (Mean = 0.542, SD = 0.498).

The survey mode of the questionnaire is not randomly assigned, but as previously mentioned, this can affect the extensiveness of answers that are given. As this is the case it is necessary to control for the mode in which the survey was conducted, via video, telephone or web. These variables are subsequently coded as dummies 1 for video (Mean = 0.434, SD = 0.204), 2 for telephone (Mean = 0.017, SD = 0.128) and 3 for web (Mean = 0.940, SD = 0.238).

A moderating variable that is taken into account in the analysis is the possibility of permanent illness or disability. As has been found by authors such as Gollust and Rhan (2015 and Schur et al. (2002) illness or disabilities can significantly hinder the extent to which a person can participate politically. For instance, due to a disability, one might face mobility issues. To control for this in the model, a variable is added which measures whether the respondent mentions not being able to work as a result of disability. The variable has a value of 0 if there is no mention of disability during the interview, and a value of 1 if disability is mentioned (Mean = 0.05, SD = 0.228).

The question of whether vaccines cause autism or not, is a matter that has concerned parents for quite some time. Despite being debunked on many occasions, the myth continues to be raised in conversations when parents decide if they are going to vaccinate their kids. Many hospital and government websites provide a statement saying that there is no need to

worry about such consequences (World Health Organization, 2003; Children's Hospital of Philadelphia, 2018; CDC, 2021). Seeing as this is an issue that predominantly concerns parents, a variable asking how many kids between the ages of 0-17 the respondent has is added as a control variable. If the respondent answers yes, the answer is coded as 1. If the respondent answers with no, the answer is coded as 0 (Mean = 0.3159, SD = 0.4649)

The model and all variables that were included in it was testes for the necessary statistical assumptions for a linear regression (see Appendix A, Figure 1, 2 and Table 2). All assumptions were met.

4. Results

This study argues that being misinformed regarding health, in this case the causal effect between vaccinations and autism, will have a negative effect on political participation. The results of the linear regression that analyses this relationship is presented in Table 1. In the model, political participation is regressed on whether or not the respondent believes that most scientific research shows vaccines to cause autism. Based on the theory, H1 of this paper expects a negative coefficient for believing the theories on vaccines and autism. After running the regression, the coefficient for vaccines causing autism is indeed negative, and statistically significant ($p < 0.001$). Based on Model 1, political participation is expected to decrease by approximately 0.271 [95% CI: -0.347, -0.203] scale points for each one unit increase in partisanship holding constant respondent age, sex, disabilities, having children, survey mode, ethnicity and education. The evidence in Table 1 is thus consistent with Hypothesis 1.

Table 1. Linear regression model for political participation.

	Model 1
Constant	1.257***
	(0.011)
Vaccines cause autism (Ref.: No)	
Yes	-0.271***
	(0.037)
Age	0.009***
	(0.001)
Gender (Ref.: Male)	
Female	0.001
	(0.021)
Permanent hindering disability	-0.107*
	(0.046)
Children	-0.113***
	(0.024)
Survey mode (Ref.: Video)	
Telephone	-0.649***
	(0.094)
Web	-0.199***
	(0.051)
Education (Ref.: Less than high school)	
High school graduate	0.115*
	(0.055)
Some college but no degree	0.339***
	(0.054)
Occupational/vocational associate degree	0.317***
	(0.061)
Academic associate degree	0.374***
	(0.064)
Bachelor’s degree	0.579***
	(0.053)
Master’s degree	0.677***
	(0.056)
Professional school degree	0.844***
	(0.068)
Other	0.461***
	(0.107)

Ethnicity (Ref.: White)	
Black	-0.035
	(0.037)
Hispanic	-0.085*
	(0.037)
Asian/Hawaiian	-0.143*
	(0.057)
Native American/Alaskan	-0.184*
	(0.072)
Mixed	0.048
	(0.058)
R^2	0.089
Adj. R^2	0.342
N	7242

Note: OLS regression coefficients with standard errors in brackets.

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.0$

A possible concern for this model is that almost 20% of the cases that are included in this analysis are missing from the model. When examining descriptive statistics it can be observed that nearly 15% of respondents answers to the question on vaccines causing autism is missing. A potential explanation for this phenomenon is social desirability bias, which is a common issue when it comes to telephone interviews (Halperin & Heath, 2017). Due to this effect it is possible that the model underestimates the amount of people that believe that vaccines cause autism.

5. Discussion

The results obtained in this study appear to confirm the hypothesis that was formulated. This hypothesis was based on the existing literature researching the effects of misinformation on participation and on studies that investigate health as a factor in political engagement of citizens. What is notable, is the negative effect that physical disability is found to have on political participation in this study on political participation. Disabilities have been established

to be a hindering factor by previous authors and the outcomes of the regression performed in this study seem to be in line with these findings. This result once more corroborates the necessity to take health into account in research on political participation in the future.

What the outcomes of this paper also seem to reveal, is that the predicting role of misinformation is not to be neglected in this interaction. Respondents that were misinformed on vaccines causing autism participate less politically than those who were aware of the scientifically correct information. However, this interaction has not been researched as such in previously published works. Despite the fact that the results verify the hypothesis, they also indicate that this relationship needs to be explored further in the future to fully understand it. There are several ways in which future research might improve on the limitations of this study.

Firstly, the focus of this paper lies solely on vaccinations causing autism to test whether an individual is misinformed. However, as mentioned in the theory section there are many different areas of health that suffer from misinformation (pp. 10-11). It might prove to be of value to investigate whether the effect of this relationship holds when it is tested using other incorrect health information. Additionally, this study argues that the underlying logic for the interaction between misinformation, health and political participation can be found in the redistribution of resources. Misinformation has been proven to go hand in hand with a deterioration of health (Oluyemi, 2015; Carey et al., 2020; Lee et al., 2020; Muric et al., 2021), however, this paper does not test for a causal relationship between being misinformed and the quality of health of the respondent, as it lies beyond the scope of this research. A respondent might be misinformed on the effects of vaccines, but this does not necessarily mean that they refrain from getting vaccinated. This is a crucial step towards the worsening of their health, and incorporating it in future research could uncover novel dynamics.

Investigating vaccination behaviour of the parents included in this model can also be a valuable addition to this research. Vaccines possibly causing autism is an issue that lives mostly among parents, as the vaccine that was initially included in the Wakefield article is administered to children (BMJ, 2011), thus putting the decision of getting vaccinated in the hands of the caregivers of the child in question. Even though they might opt out of vaccinating their child based on incorrect information, this does not prove anything about their own vaccination behaviour. Model 1 does show that having children decreases the political participation of the respondent, so maybe parents that do not vaccinate their children tend to refrain from getting vaccines as well. However, having children has been brought up as a decreasing factor for political participation in the resource model by Brady et al. (1995), as parents spend a lot of time taking care of their children.

Lastly, in light of the findings on policy feedback (p. 9) and the results of this study, it might be worth looking into how governments could be involved in battling health misinformation. Political engagement of the people in a democracy is crucial to make the system effective, and their health is a significantly influential factor in this (Schur et al., 2002; Gollust and Rahn, 2015; Burden et al., 2017; Gollust & Haselwerdt, 2019). Haselwerdt and Michener (2019) established the effects that health policy changes had on political participation through the improvement of health. Thus, government interference in the dissemination of health misinformation or active role in spreading correct information might positively influence the health of their citizens and in turn, improve their political participation.

6. Conclusion

The main goal of this paper is to explore the effects of health misinformation on political participation through the worsening of health. This is done by performing a linear regression

using election survey data from the United States. The regression controls for age, gender, disability, having children, survey mode, education, and ethnicity. The results in the model confirm the expectation that individuals who are misinformed on health are less engaged in political actions such as attending a protest, voting, and donating money. Furthermore, the model provides support for earlier findings on disabilities being a prohibiting factor for people to participate. These outcomes underline the importance of including health in research regarding political participation.

While misinformation is taken into consideration in research regarding political participation, there is no consensus about the direction of its effects. Additionally, misinformation can touch upon a wide array of topics and despite being an established issue in the realm of health, it is little researched in this regard. Studies that do include misinformation and health mostly focus on perceived levels of misinformation, without taking into account the negative effects of misinformation on health. This is done, despite the fact that health is significant predictor for political participation. Therefore, by conducting an analysis from the perspective of the deterioration of health of an individual, by asking whether respondents are misinformed instead of their perceived levels of misinformation, this study can be considered as a contribution to the literature.

This paper however, is not without its limitations. It needs to be stated that this study is conducted in the United States, and this topic need further research before it can be generalised to other countries. Moreover, even though this study is conducted from the perspective of the misinformed individual, it does not further explore the actual effect of misinformation on the behaviour of the participant. Another aspect of this relationship that this thesis does not account for, is the actual quality of health of the respondent. A recommendation for future research would be to further investigate this interaction. Furthermore, policy interactions are mentioned

as a possible way for governments to improve political participation through health policies which target misinformation.

This thesis has relevant societal and academic implications. Its first and foremost academic contribution is that it connects the three topics of misinformation, political participation, and health. By highlighting the effects of misinformation on health in relation to participation, this paper provides a novel approach which is focused on the health of the misinformed individual. Furthermore, the results suggest that people who are not aware of the correct information on vaccines, tend to be less engaged in politics than people who are correctly informed. It might be of great value to target health misinformation in an attempt to increase both the health of the population and their participation. As health is a topic that is very susceptible to misinformation, this could have a substantive effect. In sum, for the health of a democracy, it is of great importance for its people to be of good health. However, it is not possible to achieve this without regard for the role that misinformation plays in this.

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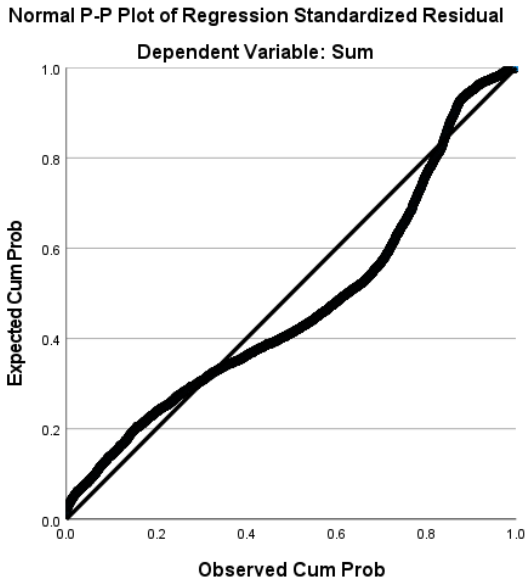
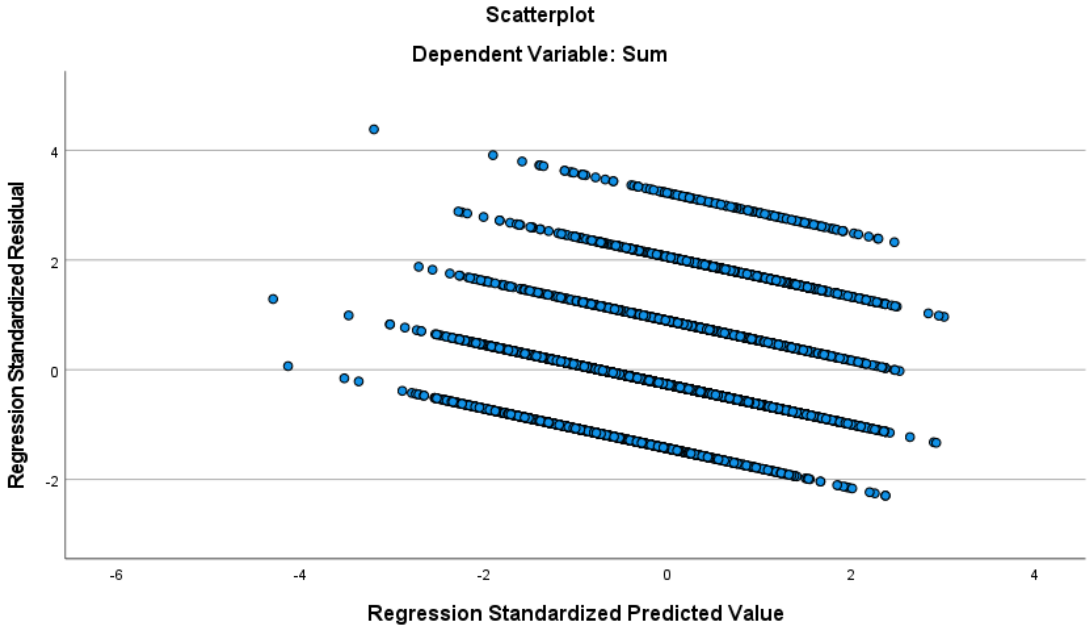
Appendix A

Figure 1. Normal P-P plot of standardised residuals.



The normal P-P Plot in Figure X shows that the data contains approximately normally distributed errors. While some points deviate a little from the normality line, the points generally follow the normality line.

Figure 2. Scatterplot of dependent variable.



The scatterplot of standardised predicted values in Figure X indicates that the data meets linear regression's assumption of homoskedasticity.

Table 2. Testing for multicollinearity.

	Tolerance	**VIF**
Vaccines cause autism (Ref.: No)		
Yes	0.994	1.006
Age		
Gender (Ref.: Male)		
Female	0.999	1.001
Permanent hindering disability		
Children		
Survey mode (Ref.: Video)		
Telephone		
Web		
Education (Ref.: Less than high school)		
High School graduate	0.994	1.006
Some college but no degree	0.998	1.002
Occupational/vocational associate degree	0.999	1.001
Academic associate degree	0.999	1.001
Bachelor's degree	0.995	1.005
Master's degree	0.993	1.007
Professional school degree	0.998	1.002
Other	1.000	1.000
Ethnicity (Ref.: White)		
Black	0.981	1.019
Hispanic	0.995	1.005
Asian/Hawaiian	1.000	1.000
Native American/Alaskan	0.999	1.001
Mixed	1.000	1.000

The results in the table indicate that multicollinearity is not an issue, as all tolerance values are above 0.2 and VIF values are below 5.