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Rumours and Fake News – Effects of Message Credibility on Human Behaviour during the Corona Pandemic

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Abstract: Recessionary situations such as the current Corona pandemic affect people's behaviour, since most people react to them with fear. Nowadays, social media is used by many people all over the world, thus, people as well as public and private organizations and groups share, post and comment messages on social media. This way, many people can be reached in a very short time. However, not all posts on social media can be defined trustworthy. Instead, a lot of people, groups and organizations make use of social media to spread rumours, fake news and conspiracy theories. There are three main motivations increasing people's beliefs in these types of news: desire to feel security for themselves as well as the groups they belong to; making sense of their specific environment and /or striving for safety and control in times of severe recessionary situations. Among the current demonstrators against the Corona policy of the German government, one can often identify supporters of specific groups that share their beliefs. However, it is not easy to differentiate between true and fake news or rumours. The present paper uses the quantitative data collection method to investigate the reasons why people may change their behaviour in recessionary situations and why some people are more prone to believing rumours and fake news on social media than others. In this context, message credibility plays an important role. The results show that rumours, fake news and conspiracy theories are able to decrease people's trust in health agencies and / or governments.

Keywords: Corona pandemic, recessionary situation, conspiracy theories, rumours, fake news, human behaviour

оригинальная статья

Слухи и фальшивые новости – влияние достоверности информации на поведение человека в условиях пандемии коронавируса

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Аннотация: Кризисные ситуации, такие как пандемия новой коронавирусной инфекции, влияют на поведение человека; ответная реакция на них для большинства людей – страх и соответствующее поведение, вызванное страхом. На современном этапе социальные сети насчитывают огромное число пользователей по всему миру, поэтому люди, а также государственные и частные организации и группы пересылают, размещают и комментируют сообщения в социальных сетях. Таким образом, можно охватить большую аудиторию за очень короткое время. Однако не все сообщения в социальных сетях можно классифицировать как настоящие новости. Напротив, многие индивидуумы, группы и организации используют социальные сети для распространения слухов, фальшивых новостей и теорий заговора. Существует три основных причины, которые формируют и усиливают доверие людей к этим типам новостей: 1) людям приятно верить в лучшее в самих себе и сообществах, к которым они принадлежат; 2) люди хотят разобраться в своем окружении; 3) и / или люди хотят чувствовать себя в безопасности и держать все под контролем во время

серьезных кризисных ситуаций. Среди нынешних демонстрантов, выступающих против политики правительства Германии, направленной на противодействие распространению новой коронавирусной инфекции, часто можно выделить сторонников конкретных групп, разделяющих их убеждения. Однако отличить правдивые новости от фальшивых новостей и слухов нелегко. В данной работе используется метод количественного сбора данных для изучения причин, по которым люди могут менять свое поведение в кризисных ситуациях и по которым некоторые люди более склонны верить слухам и фальшивым новостям, распространяемым в социальных сетях, чем другие. В этом контексте достоверность сообщения играет важную роль. Результаты показывают, что слухи, фальшивые новости и теории заговора способны снизить доверие людей к медицинским учреждениям и / или правительствам.

Ключевые слова: пандемия коронавируса, кризисная ситуация, слухи, фальшивые новости, поведение человека

Introduction

In December 2019, the first patient developed symptoms of the Wuhan Corona virus. As a result, China informed the World Health Organization (WHO) about several pneumonia cases. On March 11th 2020, the WHO declared the outbreak of the Corona virus a pandemic[1].

The outbreak of COVID-19 at the end of 2019 in China reached more than one hundred other countries in only two months. Media daily reported up-to-date news regarding the number of infected people, the number of those recovered and, finally, the number of the deceased [1]. Up to now, the COVID-19 disease has become the fifth pandemic documented since the Spanish flu pandemic in 1918 [2]. The Corona pandemic can be considered as an unprecedented event, compared to other epidemic events in recent years. At least, the last pandemic of such scale happened more than 100 years ago: the Spanish flu. Scientists such as M. Honigsbaum (2013) mention that the Russian flu killed approximately one million people in Europe between 1889 and 1893. However, the Spanish flu killed 50 million people, which made around three percent of the world's population. The fear associated with these diseases was amplified by the mass-market press and the invention of the telegraph – this again can be compared to the rise of social media platforms in recent years [3].

The ongoing global COVID-19 pandemic challenges all countries. As a result, many countries react with different measures in order to prevent a further dissemination of the virus. However, to stop the continuing Corona virus dispersion countries react differently. It's estimated that without Corona mitigation strategies COVID-19 would have resulted in approximately 7 billion infection contaminations as well as 40 million deaths worldwide in 2020 [4]. At the time of the Corona virus outbreak, there was no reliable vaccine against COVID-19 and even nowadays, COVID-19 vaccines cannot provide 100% protection. Hence, the Federal Republic of Germany ordered lockdown on March 16th 2020

and public life was shut down: shops had to close immediately, events were forbidden, aircrafts had to remain on the ground and the population was instructed not to leave their houses except for emergency cases such as essential purchases or visits to the doctor. Social distancing very soon became one of the most used terms in the media. Now, almost two years after the outbreak of the Corona pandemic, there are some vaccines on the market, but none of them can provide people 100% protection from COVID-19. In this context, it must be mentioned that Corona mitigation measures are not widely popular. Indeed, the major aim of Corona mitigation measures is to save people's lives. Nevertheless, for some people, the negative aspects of mitigation measures overcome the positive ones. D. A. Moser et al. (2020) for instance, concentrated on years of life lost (YLL) due to the psychosocial consequences of COVID-19 mitigation strategies. Governments are forced to implement social mitigation measures to reduce mortality and morbidity. However, these strategies carry significant risks for people's mental health – this again might lead to short- and long-term mortality. Impacts like these are not considered in modeling the pandemic's impact. Due to this, the so-called years of life lost and influencing factors such as depression, childhood trauma, domestic violence, suicide, alcohol abuse, social isolation and changes in marital status are in the focus of attention [5]. Other analysts state that the Corona pandemic ravages both health and economic metrics globally, which also includes progress in terms of maternal and child nutrition. As a consequence of COVID-19, impacts on essential medical interventions, poverty, and access to nutritious foods can be observed. Thus, incomes, social protection, food supplies as well as health care services are somehow affected by the Corona pandemic [6].

Regarding the media, there hardly was any space for other topics. Controversial, heated discussions and debates on the virus' danger, the efficiency of Corona mitigation

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[1] Kretchmer H. Key milestones in the spread of the coronavirus pandemic. 22 Apr 2020. *World Economic Forum.* URL: https://www.weforum.org/agenda/2020/04/coronavirus-spread-covid19-pandemic-timeline-milestones/ (accessed 11 Jan 2022).

Социология управления

measures and the Corona policy of the German government spread quickly, especially on social media. With the development of the Internet and, especially, social media, many social media users tend to spread information without checking its trustworthiness [7]. News has been dominated by virologists and, up to now, there is no consensus among experts, whether the German government's assigned measures can be called reasonable and justified or not. Moreover, there is no consensus whether and to what extent these measures are proportional to the threat of the Corona virus.

Misinformation is not a modern-age phenomenon. Quite the opposite, it is known as coming from all types of media such as newspapers, radio or TV. In fact, misinformation in media is as old as writing systems. Nowadays, online platforms, especially social media evolved into the main source for a still increasing number of users and so, misinformation has found a completely new channel, known as citizen-journalism [8]: social media platforms allow non-journalists to reach a multitude of people. Hence, non-journalists began to conduct journalistic activities with the goal to produce specific output such as news [9]. Initially, citizen journalists were mainly active in blogs, but social media platforms offered a much wider space [10].

Even at the pandemic's beginning, the establishment of specific groups or rather resistance movements against the imposed measures could be observed. Not only there were demonstrations, but on social media one could find a flood of statements, calculations, statistics, videos and calls for participation in demonstration events. The media daily reported on broken regulations from the repertoire of mitigation measures.

In their empirical study, S. Kühne et al. state that the Corona crisis has changed nearly all areas of social life. First of all, people are frightened, since a new and unpredictable virus stepped into their life [11]. Another aspect is that mitigation measures such as limitation of contacts and shutdown of institutions significantly affected social community. This applies to organizations, associations and groups, but also to life within the family as well as the circle of friends and acquaintances. The radical changes during the Corona pandemic thus affect the society's perception: people's view on government institutions may change the same as experience and perception of the society's solidarity. At least, mitigation measures can affect people's satisfaction with the democracy of the Federal Republic of Germany and, consequently, trust in governmental institutions.

Social media definitely can be seen as an additional and valuable source of information for people during the Corona pandemic. A huge proportion of the population can be reached by means of social media. On the other hand, the population has also been confused by numerous fake news [12]. Hence, the question is, whether people are able to differentiate between truth and fake news.

In academic literature there is no unified definition for 'fake news' and 'rumours'. A suggestion is: "Fake news is the presentation of false claims that purport to be about the world in a format and with a content that resembles the format and content of legitimate media organizations" [13].

R. Rini has another suggestion and states that "A fake news story is one that purports to describe events in the real world, typically by mimicking the conventions of traditional media reportage, yet is known by its creators to be significantly false, and is transmitted with the two goals of being widely re-transmitted and of deceiving at least some of its audience" [14].

'Fake news' and 'rumour' must be differentiated as, according to some authors, a rumour is distorted, irrational, inauthentic and exaggerated information. According to others, a rumour can be seen as an unconfirmed or unverified message, which is passed between humans [15]. It becomes clear that a rumour can be verified at a later time to be either true or false, whereas fake news can never be true. Credibility of a message thus determines whether people believe in news or not. The Macmillan dictionary, for instance, defines credibility as "Qualities that someone has that make people believe or trust them"[2].

Credibility is believability; thus, credible people are believable people. Credibility can be described as a perceived quality, comprising multiple dimensions [16]. Regarding the connection between digital media and credibility, M. S. Eastin et al. state that, on one hand, there is credibility of the message itself, and, on the other hand, there is credibility based on the recipient's perception. It is the message's credibility, which typically puts to trial the way a message influences perception [17].

A. Appelman and S. S. Sundar focused on measuring credibility of a message in the context of news specifically, which is highly important for the matter at issue [18]. They found that credibility can be measured by asking people to determine the extent to which the three adjectives: accurate, authentic, and believable describe a specific content by rating these adjectives. Hence, the perceived message importance and people's well-being could be identified as variables, influencing behavioural intentions for rumour verification as well as sharing. H. G. Oh and H. Lee, for instance, found out that 660 Twitter users responded to unverified information with regard to the influenza vaccine by either sharing the information or commenting upon it with their own posts [19].

Considering the fact that people have difficulties distinguishing between truth and fake news, it can be assumed that rumours and fake news regarding the Corona

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[2] Credibility. *Macmillan Dictionary*. URL: https://www.macmillandictionary.com/dictionary/british/credibility (accessed 21 Jun 2021).

virus and its consequences affect human behaviour. At least, the development of media reporting gives the impression that with time, more and more people rebel against the imposed mitigation measures, demonstrate and fight for freedom and human rights. In view of this, national newspapers, for instance, reported on the Corona demonstration in Berlin on August the 29th that the authorities initially encroached on the law of freedom of assembly and prohibited the event[3].

According to A. Sternisko et al., conspiracy theory beliefs are somehow linked to prejudice, anti-democratic attitudes and non-normative political behaviour. For instance, partisans of the right-oriented AfD (Alternative fuer Deutschland) feel more freedom-restricted due to the Corona policy of the German government than the partisans of any other party. There are three main motivations, which increase people's beliefs in conspiracy theories [20]:

(1) people want to feel secure themselves as well as the groups they belong to,
(2) people want to make sense of their specific environment or
(3) people want to feel safe and in control.

Among the Corona demonstrators, one can often identify supporters of specific groups. The media, for instance, report on calls of right-wing extremists, the anti-vaccination movement, anti-Semites and supporters of different conspiracy theories to join demonstrations against the Corona measures [11].

Hypotheses

In order to understand human behaviour during recessionary situations such as the Corona pandemic and the role of rumours and fake news spread on social media, it must be clarified how rumours and fake news can influence people's behaviour and to what extent theories and models of human behaviour can explain the influence of human beings in the times of rumours and fake news. It is also essential to establish how credibility of a message can influence human behaviour and understand the role of social media regarding the spread of rumours and fake news on the Corona pandemic. It might be possible that individuals possess specific characteristics, attitudes or even group memberships that make them more susceptible to rumours and fake news on Corona.

To manage severe recessionary situations, it is important to know if people, influenced by rumours and fake news on social media follow lockdown rules and mitigation measures such as wearing a mouth/nose protection, keeping quarantine or prohibition to meet friends more seldom. The above-explained research goals result in the following hypotheses.

Germany's Corona mitigation measures significantly affected the health of children and adolescents, since they more frequently suffer from contact restrictions than older people. Due to this, it can be assumed that people with children under the age of 12 initially possess or develop a more critical attitude towards Corona mitigation measures:

H1: People with children under the age of 12 in the same household do more frequently believe in rumours and fake news as compared to childless people.

Scientists, such as K. L. Milkman et al. emphasize that some groups could be identified as being more critical than others [21]. This, for instance, is the case of young females – many of them have been found to be more skeptical about the COVID-19 vaccine. Hence, the following hypothesis will be checked:

H2: During the Corona pandemic, younger people are more prone to believing rumours and fake news on social media.

M. Marchlewska et al. showed that people's belief in conspiracy theories might also result in hostility towards specific groups, since they are made responsible for the outbreak and / or further spreading of the virus [22]. So, it can be assumed that people who believe in rumours, fake news, conspiracy theories and misinformation spread on social media are more likely not to follow governmental Corona mitigation measures and public health authorities' advice:

H3: People follow lockdown rules and mitigation measures more seldom, if they believe in rumours and fake news spread on social media.

J. J. Van Bavel et al. showed that people who rate national identity as being important are more likely to support governmental health policies and that national identification positively correlates with national narcissism as well as right-wing political ideology [23]. This implies that there might be several characteristics, attitudes or even group memberships, which make people susceptible to rumours and fake news on social media:

H4: People are more susceptible to rumours and fake news on Corona, if they possess specific characteristics and attitudes such as risk-seeking behaviour and being a critical person.

B. Umeogu identified the three main dimensions of source credibility: trustworthiness, competence / expertise and goodwill [24]. M. Eisend summarized various dimensions of source credibility, which are, for instance, competence, expertise, knowledge, ability, experience, qualification and smartness, trustworthiness, personal integrity and character [25]. It can be assumed that people perceive information given on social media or via other channels as credible, if this information is accurate and rich in detail:

H5: Whether people perceive information as credible or not strongly depends on the information's accurateness or amount of detail.

Социология управления

Anxiety can result in two different ways: on the one hand, there are people who strive for seeking as much information as possible on the specific topic to reduce anxiety [26]. On the other hand, there are people who refuse seeking for information and thus stay ill-informed. Hence, a connection between anxiety and believing in rumours and fake news on social media can only be assumed, which leads to the following hypothesis:

H6: The more people fear the Corona virus, the more they believe in rumours and fake news.

Due to the findings of K. L. Milkman et al., it can be assumed that women and men react differently to rumours and fake news spread on social media. These rumours and fake news can fuel already existing skepticism [21]:

H7: Susceptibility to rumours and fake news on social media is connected with gender differences.

A critical person is inclined to be skeptical to a certain extent. Thus, it can be assumed that a critical person does not believe in everything they are confronted with on social media, but checks its trustworthiness first. Due to this, it can also be assumed that a critical person generally does not change their behaviour during a pandemic so as to refuse or oppose the mitigation measures:

H8: The more people describe themselves as a critical person, the lower the risk they change their behaviour in terms of developing a negative attitude towards the government's Corona mitigation measures during the pandemic.

People who are more likely to trust information coming from the government are also more likely to accept administering the COVID-19 vaccine [27]. A connection between people's trust in information given by governmental institutions or other sources and their belief in rumours and misinformation can be estimated as:

H9: The less people trust in politicians and the government, the more they believe in fake news and rumours spread on social media.

Some people do not agree with the Corona mitigation measures instigated by the government, which might be explained by several aspects. For this reason, it can be assumed that some people have developed a more critical attitude towards the Corona mitigation measures, which changed their behaviour during the pandemic.

H10: People, who believe there is some truth in rumours and fake news spread on social media, have developed a more critical attitude towards Corona mitigation measures during the pandemic.

Methods
A quantitative online-survey by means of a standardized and structured questionnaire was used to generate data on people's behaviour, characteristics, attitudes and beliefs.

The standardized questionnaire contained five sets of questions. Sociodemographic data was to be collected at the end of the questionnaire, since people might have been discouraged if they had been questioned on their personal information first. To motivate participants, the first section explained the research topic briefly. All questions were presented in German, since the online-survey was only conducted in Germany and participants could have had problems understanding questions in a different language. To help international readers, all questions were translated into English.

Additionally, many questions contained answer options presented below. Some other items had to be rated by the participants by means of the following four-point-scale:
- 1 (fully correct)
- 2 (rather correct)
- 3 (rather incorrect)
- 4 (incorrect at all)

The reason for choosing a four-point-scale instead of the more popular five-point-scale is that participants tend to choose the middle, if they are not sure of their answer. In the case of a four-point-scale, participants must choose one side.

The standardized questionnaire contains five question parts:
- Introduction into the research topic
- Evaluation of specific Corona statements found on social media platforms
- Evaluation of Corona mitigation measures of the Federal Republic of Germany
- Personal attitudes
- Sociodemographic data.

Each part contains several items and, in sum, 42 variables can be defined. A sample calculation was run to identify the minimal number of participants. Within this research, a sample size of 380 participants could be questioned. By means of the questionnaire, a sample of 324 inhabitants of the Federal Republic of Germany could be questioned during 2021 springtime.

The survey was conducted by means of SurveyMonkey online platform. An Internet search could show that other researchers also used the platform for academic research, for instance, N. Johansen et al., who used SurveyMonkey to distribute their questionnaire [28]. Thanks to this service, a link to the survey can be created and subsequently easily distributed using several social media platforms such as Facebook, Instagram[4] and Twitter.

The survey was active for three months and aggregated a sufficient number of participants. However, it was not possible to reach more than 324 people. Having in mind the sample calculation, it becomes clear that the calculated 380 cases could not have been accumulated within

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[4] Meta Platforms, the parent company of Facebook and Instagram, is banned in the Russian Federation as an extremist organization. *Компания Meta Platforms, владеющая социальными сетями Facebook и Instagram, признана экстремистской организацией, ее деятельность запрещена на территории РФ.*

the time stated. However, the sample is big enough to gain first insights into people's behaviour during recessionary situations. As is further explained in the limitations section, the study should be conducted within a larger scale.

To analyze the gathered data, appropriate statistical data analysis methods were used. For instance, calculation of correlations, Chi-square test, variances and standard deviation as well as average values. The present paper uses the IBM SPSS software analysis to calculate the above-mentioned values and check the hypotheses presented above.

Results

The major aim of the paper was to analyze the effects of social media and fake news on human behaviour during the Corona pandemic. Regarding the research goals and online survey analysis data, the results are as follows.

The main difference between rumours and fake news on the topic of the current Corona pandemic spread on social media is the following: A rumour must not necessarily be false – firstly, it is unclear whether or to what extent a specific rumour is true or not. After some time, a rumour can be identified as being true or false. Secondly, this is, for instance, the case when scientists were able to give empirical evidence on a specific rumour: then, the rumour is no longer a rumour, but accurate information. With the upcoming of the Internet and the worldwide Web, rumours and fake news found a new way to be spread around the world in a very short time. This happens due to the fact that people can use social media platforms such as Facebook, Twitter and Instagram to reach millions of others with their posts. Especially in times of global crises such as the present Corona pandemic, people use the Internet to gather information. Due to the enormous flood of information, many people are overwhelmed and have problems differentiating between true and false information.

The list of rumours and fake news on the topic of the Corona pandemic is quite long and not all types of misinformation could be presented in the present paper. However, here are some examples that can be found on social media, such as "drinking chlorine dioxide kills the virus", "interval-fasting helps against the virus", "consumption of antiseptics kills the virus", "masks are dangerous because of the accumulation of CO_2" or "nicotine protects against COVID-19".

Human behaviour in recessionary situations such as the current Corona pandemic is hard to predict or model, since there is a huge variety of different influencing factors. Some scientists focused on the development of human behaviour prediction models, but these models have their limitations and must be considered with caution. The following summary of the trial results is presented below:

H1: People with children under the age of 12 in the same household do more frequently believe in rumours and fake news than childless people.

Hypothesis 1 must be rejected, since there is no significant relationship between the number of children under the age of twelve and the participants' belief in rumours and fake news. However, there is one noteworthy exception:

People with one or more child under the age of twelve more frequently believe that the COVID-19 vaccination changes genetic material than childless people do. Although the number of participants with more than two children is relatively small, the results show an important tendency and should be checked with a greater continuous sampling.

H2: During the Corona pandemic, younger people are more prone to believing in rumours and fake news on social media.

All rumours and fake news of Q1 were investigated regarding any major differences depending on people's age, but there was no significant relationship between people's age and their susceptibility to rumours and fake news on social media. Thus, H2 is rejected.

H3: People follow lockdown rules and mitigation measures more seldom, if they believe in rumours and fake news spread on social media.

The correlation is noticeable only at 0.01 significance level. In other words, there is a positive relationship between both variables: The more people believe in the truth of rumours and fake news spread on social media, the more seldom they follow the Corona mitigation measures. Thus, H3 was accepted at 0.01 significance level.

H4: People are more susceptible to rumours and fake news on Corona, if they possess specific characteristics, attitudes or group memberships.

The standardized questionnaire collected several different characteristics and attitudes, but only the correlation between Q16 and Q29 could be identified as being highly significant at 0.01 significance level. In summary, this leads to the following results:

- People who rate themselves as being risk-seeking show a higher tendency to believe in rumours and fake news spread on social media.
- The more people are convinced that economic and social consequences of mitigation measures are destructive rather than beneficial, the stronger they believe in rumors and fake news spread on social media.
- The stronger people believe that the Corona mitigation measures interfere with civil rights and liberty and thus are unconstitutional, the more likely they believe in rumours and fake news spread on social media.
- The stronger people are convinced that virologists and specialists with a critical attitude against Corona measures can only use social media as an information channel and are quickly called conspiracy theorists, the more likely they believe in rumors and fake news spread on social media.

In summary, specific characteristics and attitudes have influence on the extent to which people believe in rumours and fake news spread on social media.

H5: Whether people perceive information as credible or not strongly depends on the information's accurateness or richness of detail.

The highest ratings that could be collected depended on a person's expertise or knowledge, their trust and the information's accurateness or richness of detail. Thus, H5 can partly be accepted, but has to be extended by such influencing factors as "a person's trust" and "a person's expertise or knowledge".

H6: The more people fear the Corona virus, the more they believe in rumours and fake news.

According to the results, the following conclusions can be summarized:
- The stronger people believe the Corona virus is not more dangerous than conventional influenza, the stronger they believe in rumours and fake news spread on social media.
- The stronger people are convinced that the virus is very dangerous and the stronger the virus frightens them, the less they believe in rumours and fake news spread on social media.

Thus, H6 can be accepted at 0.01 significance level.

H7: Women are more susceptible to rumours and fake news on social media than men.

There is no significant difference between both genders regarding their belief in rumors and fake news and thus, H7 must be rejected.

H8: The more people describe themselves as a critical person, the lower the risk they change their behaviour during the pandemic.

Regarding the hypotheses check, the following results can be summarized:
- The higher people rate themselves as being critical, the less likely they are to change their behaviour during the pandemic in terms of rejecting mitigation measures.
- The higher people rate themselves as a critical person, the more likely they follow Corona mitigation measures.

Hence, the hypothesis H8 can be accepted.

H9: The less people trust in politicians and the government, the more they believe in fake news and rumours spread on social media.

Checking H9 included consideration of several variables. Due to this, the following results can be summarized:
- The stronger people believe in rumours and fake news spread on social media, the less they trust in information coming from politicians.
- The stronger people believe in rumours and fake news, the less they trust in information provided by federal authorities.
- The stronger people believe in rumours and fake news, the more convinced they are that the government lets the pandemic seem more dangerous than it actually is.
- The stronger people believe in rumours and fakes news, the more they have the impression that political decisions are becoming more and more incomprehensible.

- The stronger people believe in rumours and fake news, the more convinced they are that the government is hiding facts sharing information with the public.
- The stronger people believe in rumours and fake news, the more convinced they are that reports on Corona topics are too biased and dictated by the government.
- The stronger people believe in rumours and fake news, the more convinced they are that information, released by the government, does not adequately meet the truth.

In summary, it can be stated that people who believe in rumours and fake news evaluate the way the government provides information as hardly trustworthy.

Additionally, due to rumours and fake news spreading on social media, people have become more critical towards Corona mitigation measures.

H10: People, who believe that there is some truth in rumours and fake news spread on social media, have developed a more critical attitude towards Corona mitigation measures during the pandemic.

According to f H10, the following can be summarized:
- The stronger people believe in rumours and fake news, the more likely these people develop a critical attitude towards Corona mitigation measures.

Thus, H10 can be accepted at 0.01 significance level.

Conclusion

In terms of limitations, it must be mentioned that the present paper only focused on examining rumours and fake news spread on social media platforms. However, there are many conspiracy theories on the Corona topic, circulating via other online and offline channels that further research can concentrate on.

Additionally, the present paper only considers rumours and fake news in English and German. Beside these languages, there are many other rumours and fake news in languages the paper did not cover. As the results are based on an investigation in the Federal Republic of Germany, it must be taken into consideration that they cannot be transferred to other countries' population. Impacts of rumours and fake news on human behaviour may differ depending on a particular country. Another issue that limits the present paper's results is that some COVID-19 rumours, used for confrontation with the people engaged, with time might be classified as accurate information.

Potential for improvement lies in using a greater yield of samples. The survey lasted three months; however, it was not possible to reach the necessary calculated number of participants. It can be assumed that a larger sample size would make results more reliable. Another potential for improvement lies in extending the questionnaire. Extra characteristics and group memberships could be identified from previous studies and/or additional statements could be added to the existing items.

In summary, not only is the COVID-19 pandemic affecting people's behaviour, but also the way scientists study

behaviour. In future, researchers probably will conduct more substantial studies to produce widely applicable findings. The study of J. J. Van Bavel et al. already made the first step towards such international collaborations to study the same topic but within the territory of several countries [23]. It's probable that the COVID-19 pandemic made researchers more willing to share information and collaborate. Instead of running small experiments, mega-studies can be conducted by large groups of scientists. Moreover, bigger sample sizes can be gathered due to new social distancing practices – in future, experiments will mainly work online, which can be seen as an important improvement on scientific methodology. Thus, the COVID-19 pandemic can also be seen as a chance for researchers to rethink the fundamentals of science, since the way people communicate has significantly changed as well as the engagement with collaborators.

The present paper shows that the Corona pandemic must be seen as a serious economic and health crisis – it caused major global disruption and up to now, there is no end in sight. The results obtained show that not everybody agrees with the governmental mitigation measures and for some people negative side-effects, especially with regard to children's health, predominate positive effects of the mitigation measures. Hence, in future, there will be a huge variety of different interesting approaches for scientists in the field of human behaviour.

Investigation of the future of SARS-CoV-2 by S. M. Kissler et al. states that its role will not diminish until 2024 [29]. However, these estimates must be seen in the context of human behaviour. People's psychological condition is affected due to the Corona pandemic, especially, global governmental mitigation measures of social distancing. Therefore, it can be assumed that human behaviour in the course of the pandemic will change in a very different direction – this again leads to a huge variety of research approaches. Some scientists, such as I. A. Cristea and F. Naudet, also emphasize that

research on human behaviour will be significantly influenced by the Corona pandemic – but these authors see the impacts from another point of view [30]. Due to the governmental mitigation measure of strict lockdowns, research laboratories often had to close, too. According to the authors, disruptions like these provide important opportunities for structural reforms.

Human behaviour research is strongly associated with specific data collection methods such as experiments, observations or personal interactions between researchers and participants. In their article on opportunities and challenges for future human behaviour research in the context of the Corona pandemic, C. Gentili and I. A. Cristea postulate that data collection will probably not return to conventional normality [31]. To give an example in the field of human behaviour research, the authors state that in general, neuroimaging studies require placing the participants in a confined space of magnetic resonance imaging scanners. Studies like these, for instance, measure electroencephalography, stress hormones, psychophysiology and/or even require placing of electrodes, collection of salvia or blood samples, which implies that often there is a close contact between researchers and participants. Research in behavioural science is based on interaction. Therefore, experiments can only be conducted in a "socially distant" way, which, for instance, means making both research personnel as well as participants wear masks and/or keep a safe distance [31].

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