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**Social Psychology of Conspiracy Beliefs: antecedents, consequences, and online communication.**

**Coordinatore:** Ch.mo Prof. Giovanni Galfano

**Supervisore:** Ch.ma Prof.ssa Caterina Suitner

**Co-Supervisore:** Ch.mo Prof. Luigi Alessandro Castelli

**Dottorando:** Bruno Gabriel Salvador Casara

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## Social Psychology of Conspiracy Beliefs

Conspiracy beliefs appear to be widespread phenomena that occur in several contexts and times. For example, a multinational survey conducted by YouGov<sup>1</sup>, which considered 21 countries, highlighted that the share of the population agreeing with this conspiratorial statement “Regardless of who is officially in charge of governments and other organizations, there is a single set of people who secretly control events and rule the world together” ranged from 19% (in Japan) to 78% (in Turkey). Moreover, several conspiracy theories appeared in different historical periods, for example, scholars reported that conspiracy theories were frequent in Ancient Rome (Pagán, 2008), and conspiracy theories against Jews were used for the Nazis’ propaganda (Fay, 2019).

Moreover, conspiracy beliefs appear to have consequences in many domains. For example, conspiracy beliefs have been linked to detrimental behaviors for public health, civic engagement, and social cohesion. These and other societal consequences of conspiracy beliefs have become a public concern, with international organizations like the World Economic Forum and the World Health Organization highlighting that conspiracy beliefs are a threat to civil liberties, democracies, and public health (World Economic Forum 2020<sup>2</sup>, World Health Organization, 2020<sup>3</sup>).

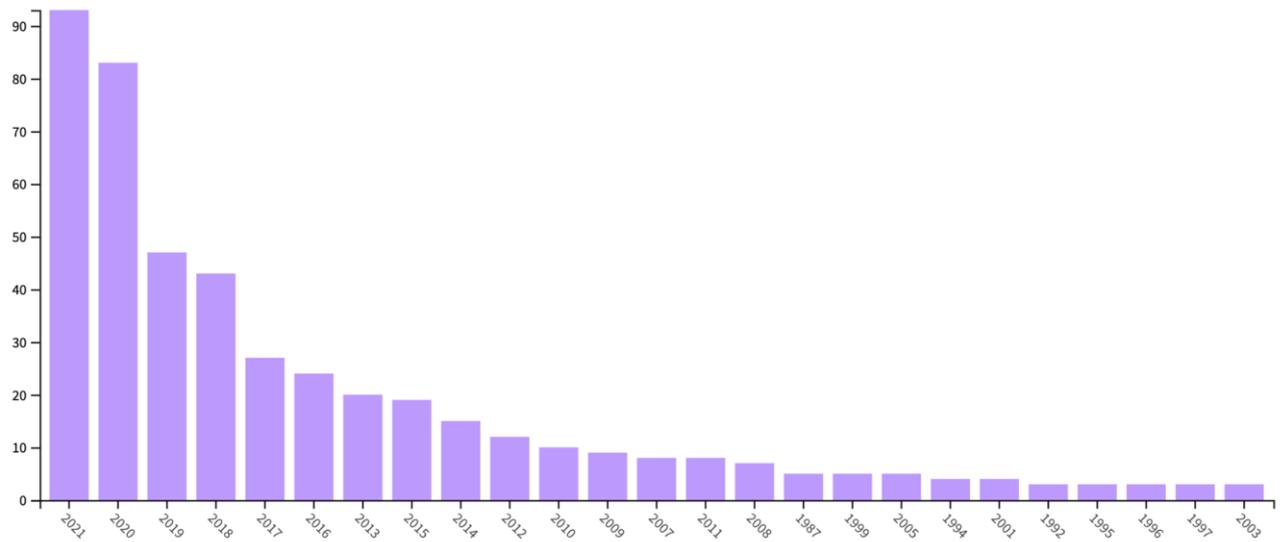
Not surprisingly, the topic of conspiracy beliefs has become increasingly popular among psychology researchers. This is evident in Figure 1 where the publication number on the Web of Science core collection (<https://www.webofscience.com>) about the topic “conspiracy” in the category “Psychology” has steeply raised in the last 40 years.

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<sup>1</sup> <https://yougov.co.uk/topics/international/articles-reports/2021/01/18/global-where-believe-conspiracy-theories-true>

<sup>2</sup> [http://www3.weforum.org/docs/WEF\\_Global\\_Risk\\_Report\\_2020.pdf](http://www3.weforum.org/docs/WEF_Global_Risk_Report_2020.pdf)

<sup>3</sup> <https://www.who.int/news-room/feature-stories/detail/fighting-misinformation-in-the-time-of-covid-19-one-click-at-a-time>



the popularity of conspiracy beliefs can largely vary among individuals and societies. The efforts of conspiracy beliefs researchers are on detecting individual features to tease apart people with a stronger tendency to believe in conspiracy theories, as well the situational and socio-environmental predictors that lead to the increase of conspiracy beliefs.

Moreover, another important key aspect of conspiracy beliefs is related to their consequences. Most of the research about conspiracy beliefs' consequences focused on the negative impact of conspiracy beliefs, whereas studies investigating positive or neutral consequences are still very few. Finally, once conspiracy theories are endorsed, it is important to understand how their content is communicated. Conspiracy theories are attempts to explain social events claiming that they are the results of secret plots organized in order to achieve some malevolent goal by powerful actors (Goertzel, 1994). Relevant research questions concern the communication of conspiracy theories regarding how they are spread in the social environment, which language is used for their communication, and what makes a conspiracy theory persuasive.

The goals of this dissertation were defined by these three key aspects of the study of conspiracy beliefs. In chapter 1, I formalized the theoretical framework behind the studies reported.

In chapter 2, I focused on the antecedents of conspiracy beliefs and, in particular, on the role of economic inequality on conspiracy beliefs. Specifically, in a set of 7 studies, I tested whether objective (Studies 1a, 1b, and 1c), perceived (Study 2), and manipulated (Studies 3a, 3b, 4a, 4b, and 5) economic inequality are associated and prompt conspiracy beliefs. Moreover, I tested whether the perception of anomie can explain this relationship (Studies 2, 3a, 3b). Furthermore, considering personality differences, I investigated the role of conspiracy worldview in moderating the impact of economic inequality on conspiracy beliefs

(Studies 4a and 4b). Finally, I tested whether social class affects the endorsement of conspiracy theories (Study 5).

In chapter 3, I explored the consequences of conspiracy beliefs. First, I tested the association between conspiracy beliefs and the intention to address the economic inequality issue by supporting collective action (Study 6) and taxation (Study 7). Finally, I investigated whether conspiracy beliefs affect the trust in scientists with detrimental effects on COVID-19 vaccination compliance (Studies 8a and 8b).

In the final chapter 4, I focused on the online communication aspects of conspiracy theories. In Study 9 I explored whether and how conspiracy theories are a component of fake news narratives. In Study 10, I investigated the use of conspiratorial rhetoric in political discourse. Specifically, I analyzed a corpus of messages shared by Italian political leaders on the social media Twitter. Moreover, in Study 11, I explored the differences in terms of psycholinguistic features, between messages coming from conspiratorial message boards vs. other types of message boards (political, casual, and skeptical) retrieved from the social media Reddit. Finally, in Study 12 I experimentally tested whether the use of conspiratorial rhetoric has an impact on messages' popularity.

## Chapter 1. Introduction

Humanity has never been on the Moon. Pharmaceutical Industries promote poisonous vaccines to control the world population. The 2021 U.S. Presidential elections were fraudulent. The COVID-19 does not exist. These are just a few of the conspiracy theories that can easily be found on social media. Even if these theories relate to very different topics, from technology and science to politics, all of them try to explain social events by invoking secret malevolent organized acts from powerful groups (Goertzel, 1994). In other words, conspiracy theories share important content features. First, they assume that the acts are perpetrated by groups. Second, the perpetrated plan is kept secret. Third, the impact of the secret plan is deliberately negative to those that are unaware of it, and advantageous for the conspiratorial group.

While conspiracy theories refer to the specific explanations of social events, conspiracy beliefs refer to the beliefs that conspiracies are occurring or occurred. It is important to highlight that general beliefs have at least three important features (Boghossian, 2010). First of all, all beliefs have a propositional content, namely, an assertion about what it is the reality like if the belief is true. Second, every belief can be true or false, meaning that the belief reflects a state of reality or not. Third, beliefs can be justified or unjustified, referring to the existence of reasons to endorse a specific belief. Conspiracy beliefs can be true or false, justified or unjustified, but they differ from other types of beliefs because of their propositions. Conspiracy beliefs have received considerable attention from social scientists and psychologists, which found important elements characterizing conspiracy beliefs. In particular, van Prooijen and Douglas (2018), highlighted four basic principles of conspiracy beliefs, namely, that they are universal, have important consequences, are grounded in affective processes, and entail a core social aspect. Below, each principle is further described.

**Conspiracy beliefs are universal.** As actual conspiracies are widespread in different times and cultural contexts, so conspiracy beliefs are. For example, we have evidence of people believing in conspiracy theories in ancient times. Conspiracy theories were present in Ancient Athens, during the Roman Empire (Pagán, 2008), and they were used in the Nazis' propaganda against Jews (Fay, 2019). Moreover, people believing in conspiracy theories are spread all over the world (YouGov, 2020). These results imply that conspiracy beliefs are neither specific to the Contemporary Age, nor are unique to socio-cultural contexts.

**Conspiracy beliefs are consequential.** Another important principle of conspiracy beliefs is that they have consequences. Independently from the veracity of conspiracy theories, people drive their behavior based on their beliefs. For example, believing in COVID-19 conspiracy theories has an impact both at the individual and societal level. When people believe that public authorities are dramatically exaggerating the consequences of the virus, they plausibly act coherently with this belief by defying medical and scientific guidelines (Bierwiazzonek et al., 2020). On the one hand, conspiracy beliefs' consequences are related to their content, therefore leading to content-specific consequences. Indeed, while people believing that COVID-19 is a hoax are less likely to act to avoid contagions, people believing that the virus was purposely produced in the laboratory increase self-centered protecting behaviors. On the other hand, the extant literature suggests that the presence of a general tendency in believing in conspiracy theories, independently of their content, is sufficient to predict a large variety of behavioral consequences. In particular, conspiracy beliefs reduce trust and reduce prosocial behavior (Van der Linden, 2015; Lewandowsky et al., 2013). The large variety of behavioral responses prompted by conspiracy beliefs may be due to two distinct aspects. First, all conspiracy theories share some semantic aspects. Indeed, all conspiracy theories refer to perceived powerful groups and assume their malevolent coordination. These common aspects plausibly prompt general consequences, for example, they can derogate the conspiracy theory-

targeted group members. At the same time, different conspiracy theories have a specific content that can drive specific behaviors. For example, believing in conspiracy theories about a specific political party can reduce the intention to vote for that party, whereas conspiracy beliefs related to multinational enterprises can reduce the intention to buy their product. The content of conspiracy theories can also interact with individual attitudes and values: people supporting the Democrat or Republican Parties are more attracted to conspiracy theories that refer to political rivals (Furnham, 2013).

From the reported examples, it is possible to notice that conspiracy beliefs were associated mostly with negative outcomes. Indeed, based on previous research, it seems that conspiracy beliefs lead mostly to negative consequences, yet it is still unclear whether this result is due to the focus of psychology researchers on the negative side of conspiracy beliefs. Moreover, as the consequences are driven by the content of conspiracy beliefs, it is possible that more bizarre and apparently irrational conspiracy beliefs received over-proportionate attention. Preliminary studies are showing that conspiracy beliefs can be beneficial for social movements, increasing governments' transparency and support for democracy (Moore, 2018). More research is required to understand whether conspiracy beliefs may prompt negative, positive, or neutral behavior, and to understand what forms conspiracy theories tend to take.

**Conspiracy beliefs are emotive.** Generally, conspiracy beliefs are grounded in emotional and intuitive mental processes. Anxiety plays a relevant role in the etiology of conspiracy beliefs. In particular, previous research has found that conspiracy beliefs are associated with anxiety. For example, Leibovitz and colleagues (2021) found that people believing in COVID-19 conspiracy beliefs are characterized by higher have more symptoms of anxiety disorders than nonbelievers. Similar results were corroborated by experimental evidence: in two independent samples of students, Grzesiak-Feldman (2013) found that participants endorsed more conspiracy beliefs after a high-anxiety situation and that the effect of the experimental

condition was mediated by state anxiety. However, the connection between conspiracy beliefs and emotions seems to go beyond anxiety. Van Prooijen and colleagues (2021) proposed that people believe in conspiracy theories because of their entertainment value. In other words, people believe in conspiracy theories when they elicit emotional responses (independently of emotion valence) and conspiracy beliefs can be seen as an outcome of sensation-seeking-based processes. Once again, it is interesting to discuss how these results relate to the general and specific contents of conspiracy theories. It is possible that sensation seeking can represent an individual characteristic able to predict the belief in a wide range of different conspiracy theories. Similarly, eliciting emotional responses may represent a general outcome of conspiracy theories, while the valence of such emotional responses can be shaped by the specific content of conspiracy theories.

Conspiracy beliefs are also used to justify prior attitude beliefs, coherently they are associated with confirmation bias (Salvador Casara et al., 2019): People holding conspiracy beliefs related to vaccination are more prone to search for negative keywords when they look for information on the Internet, and they tend to visit more anti-vax webpages. In other words, people do not challenge their beliefs and they prefer to look for information already aligned with their intuitions. This happens because analytic thinking requires higher effort than intuitive thinking, and people are not motivated to take this effort to counterargument their ideologies and positions. Thus, skeptical inquiries of conspiracy theories are unlikely when people agree with the overall message.

**Conspiracy beliefs are social.** The social facet of conspiracy beliefs is already suggested by their propositional content: By definition, a conspiracy belief is related to the actions of **groups** perceived as powerful and malevolent. Indeed, the existing body of research on conspiracy beliefs provides broad evidence related to the role of psychological processes that have their roots in intergroup dynamics. People are motivated to care about the ingroup

members, to protect them from hostile outgroups, to have positive images of themselves and their group, and to emerge favorably in comparison with the outgroup (Turner & Tajfel, 1979). Conspiracy narratives match these motivations, first because they can signal the intention to be aware of the outgroup and act to defend the ingroup (van Prooijen & van Vugt, 2018), second because they justify the shortcomings of the ingroup derogating the outgroup, as they explain power differences by assuming that powerful groups are acting in secret and immoral ways. Coherently, as already mentioned, confirmation bias is related to conspiracy beliefs, implying that people tend to endorse conspiracy theories that are aligned with previous attitudes, which generally entail positive information related to the ingroup and negative information related to the outgroup (Turner & Tajfel, 1979). Congruently, both correlational and experimental research has shown that key factors of intergroup conflict, ingroup positivity, and intergroup threat, are associated with conspiracy beliefs (Chayinska & Minescu, 2018; Swami, 2012). For example, conspiracy beliefs are related to collective narcissism (Cichocka et al., 2016), namely the “individual’s emotional investment in an unrealistic belief in the exaggerated greatness of an in-group” (De Zavala, 2011, p. 310), a concept that taps into both in-group bias and hostility toward the outgroup. Similarly, social dominance orientation and authoritarianism, individual characteristics related to intergroup conflict, and positive attitudes towards social hierarchies, are linked to conspiracy beliefs (Grzesiak-Feldman & Irzycka, 2009). Finally, Mashuri and Zaduqisti (2015) found that intergroup threat increased conspiracy beliefs when social identity was salient.

### **Why do we believe in conspiracy theories?**

Understanding the main features of conspiracy beliefs is particularly relevant for understanding why people believe in conspiracy beliefs. As conspiracy beliefs are universal, it has been hypothesized that individual tendencies in believing conspiracy theories are rooted in stable individual features. Indeed, an important predictor for believing in a specific conspiracy

theory is to believe in another conspiracy theory. In other words, there is an individual tendency in believing in different conspiracy theories, even when they are in contradiction (Wood et al., 2012). For example, people may believe that Osama Bin Laden is still alive and believe in the fact that Osama Bin Laden was already dead when the US government declared to have killed him.

In order to understand these associations, it has been theorized that there exists a general and stable attitude toward the acceptance of conspiratorial narratives, labeled conspiracy worldview (e.g., Dagnall et al., 2015), conspiracist ideation (e.g., Brotherton et al., 2013), or conspiracy mentality (Bruder et al., 2013). This stable attitude is viewed as a latent factor able to explain, at least partially, the belief in different specific conspiracy theories: People who believe that conspiracies happen frequently in the world will coherently interpret novel specific events and situations as characterized by conspiratorial features. Individual differences in the tendency of believing in conspiracy beliefs may be due to differences in the predisposition to apply analytic thinking, detect patterns, attribute agency, and attachment style (Mikušková, 2021; Brotherton et al., 2013; Douglas et al., 2016; Leone et al., 2018). Moreover, socio-structural characteristics of contexts, and how people give meaning and interpret their social environment, represent other important key factors in the etiology of conspiracy beliefs. As I already mentioned, conspiracy beliefs are based on emotional, intuitive, and intergroup processes. Coherently, conspiracy beliefs arise where information is ambiguous and characterized by intergroup conflict. For example, Salvador Casara and colleagues (2019) found that participants believed more in conspiracies after reading a text presenting opposite points of view related to vaccination, in comparison to one-sided (both pro- and anti-vax) texts. Moreover, historical evidence highlights that conspiracy beliefs flourish in times of societal crisis, when people are plausibly invested by strong feelings of fear and anxiety, and when it is hard to give meaning to personal and social experiences (van

Prooijen & Douglas, 2017). In sum, evidence suggests an interaction between individual and environmental features: People with a predisposition to believe in conspiracy beliefs are more likely to apply this preference when the environment is threatening and prompts uncertainty. In line with this reasoning, Uscinski and colleagues (2016) found that participants with a high conspiracy worldview believe in the proposed conspiracy theory only when conspiratorial informational cues were provided.

In line with this interactionist perspective, Van Prooijen and Van Vugt (2018) theorized that this general tendency for believing in conspiracies is the result of evolutionary adaptive processes. According to this theoretical account, the tendency to believe in conspiracy narratives is the result of natural selection. Specifically, in ancient societies, it was not uncommon to die because of hostile coalitions (Chagnon, 1988; Walker & Bailey, 2013). Therefore, people who tended to recognize these hostile coalitions were also more likely to avoid them and ultimately survive. This is especially true if one considers that false positives led to less tragic consequences than false negatives. The tendency to believe in conspiracy narratives is therefore viewed as part of human nature and a piece of psychological human repertoire, which is applied when specific environmental cues are triggered. Overall, this evolutionary perspective explains why conspiracy beliefs are universal in different times and cultural contexts and provides predictions about which environmental factors should trigger conspiracy beliefs. However, it does not suggest which psychological needs drive individuals to embrace such explanations.

This limit has been overcome by a popular and modern framework proposed by Douglas and colleagues (2017), which highlighted that conspiracy beliefs are an attempt to satisfy three main psychological needs: existential, epistemic, and affiliation needs. Below, I will detail each need.

**Existential needs.** People need to feel safe and secure in their environment. Coherently, when humans face stressful situations and threats, they apply several psychological mechanisms with the aim to maintain or restore their psychological well-being (Harding & Sibley, 2013). Conspiracy beliefs can be one of the psychological responses to the perception of existential threats. Indeed, conspiracy beliefs may be a precursor of intentions to engage in actions that are aimed at solving stressful situations (Manza et al., 2010). Moreover, some conspiracy theories can imply reassuring narratives of negative situations and experiences. For example, the belief that the COVID-19 is not happening is less threatening than facing the real severity of the virus. Moreover, beliefs in conspiracy theories can be a way to justify the system, as only members of small secret groups are blamed for dysfunctions of societies (Jolley et al., 2018). To sum up, evidence suggests that people use their conspiratorial worldview as a psychological buffer against the threats of the social system in which they live (Federico et al., 2018; Franks et al., 2013; Jolley et al., 2018).

**Epistemic Needs.** People need to understand their social environment or at least they need to give meaning to what they experience (Heider, 1958). The advent of the Internet and social media has provided us the chance to be spectators of a vast amount of events. Data and information are becoming increasingly relevant aspects of modern societies, which sometimes are even called “Information Society”. In such globalized societies, there are many complex issues that require complex explanations to be addressed (e.g., Global Warming, the COVID-19 pandemic, terroristic attacks). Differently, conspiracy theories propose simple explanations for a wide range of complex events. In line with this epistemic need hypothesis, conspiracy beliefs increase when messages highlight contradictory perspectives on a scientific topic (Salvador Casara et al., 2019), and when events are large in scale and significant but only small-scale explanations are available (Leman & Cinnirella, 2013).

**Social needs.** People need to have a positive image of themselves and of their groups. Low-status group members are motivated to believe in conspiracy theories because the latter generally blames powerful groups. Moreover, conspiracy theories can also provide justification for the ingroup members, which can be viewed as competent and moral but sabotaged by the conspiracy's actors. This reasoning is consistent with findings that members of lower status groups tend to endorse more conspiracy theories (Goertzel, 1994; Uscinski & Parent, 2014), and conspiracy beliefs are associated with prejudice toward powerful groups (Imhoff & Lamberty, 2018) and with intergroup threat (Mashuri & Zaduqisti, 2014).

Overall, conspiracy beliefs are seen as attempts to cope with existential, epistemic, and social threatening situations. Once again, it is important to highlight the potential interaction between individuals and the socio-environment: While psychological needs are intended to be present to a certain degree of individual differences in all humans, socio-structural features of the environment can prompt and frustrate these needs. Moreover, even when psychological needs are triggered, conspiracy beliefs represent just one potential response. Indeed, other strategies are available to address psychological needs (e.g., justify the economic system, Goudarzi et al., 2020; trust in science, Farias et al., 2013; religious beliefs, Solt et al., 2011). Indeed, it is still unclear which conditions lead people to believe in conspiracy beliefs instead to adopt other types of beliefs.

Based on this corpus of evidence, in this thesis I tested whether a specific socio-environmental context feature, namely, economic inequality, can trigger conspiracy beliefs. In particular, I hypothesized that economic inequality triggers anomie, a social perception that frustrates psychological needs (Teymoory et al., 2017), resulting in an increasing of conspiracy beliefs. Moreover, taking into account individual differences, I also tested whether this link between the economic inequality threat and conspiracy beliefs is stronger when people already endorse a stronger conspiracy worldview.

## **Consequences of conspiracy beliefs**

As already mentioned, one of the basic features of conspiracy beliefs is that they are consequential, meaning that people act in line with their beliefs and their acts have consequences both for themselves and their social environment. An important question related to the consequences of conspiracy beliefs is whether they can produce negative or positive outcomes. Most of the research pertaining to the consequences of conspiracy beliefs focused on the negative consequences (Douglas et al., 2019). The extended literature highlights that conspiracy beliefs have a negative impact in several domains, including health-related behaviors, political engagement, work engagement, and trust in science. Furthermore, conspiracy beliefs seem to increase violent, radicalized, and extreme behaviors (Levinsson et al., 2021).

Even if conspiracy beliefs should be particularly appealing when existential, epistemic, and social needs are frustrated, evidence suggests that conspiracy beliefs do not satisfy them but rather exacerbate them. For example, conspiracy theories about vaccination are particularly attractive for people already worried about it. Yet, believing in conspiracy theories about vaccines increases the fear of vaccination (Romer & Jamieson, 2020), implying that the existential need is not satisfied. Similarly, epistemic needs seem not successfully addressed by conspiracy beliefs as experimental evidence showed that exposure to conspiracy beliefs increases uncertainty (Jolley & Douglas, 2014a). Finally, even if conspiracy beliefs are appealing to people with frustrated social needs, evidence shows that conspiracy beliefs increase distrust towards others, reduce intentions to engage in prosocial behaviors, and increase prejudice towards other groups (Jolley & Douglas, 2014b, Lee, 2017). Thus, it is possible that endorsing conspiracy beliefs may facilitate negative interactions with others, alienation, and marginalization (Bilewicz et al., 2019).

It is unclear whether this negative portrait of conspiracy beliefs represents a complete representation of the phenomena, or it is the result of the focus on the negative consequences of conspiracy beliefs. Indeed, the consequences of conspiracy beliefs are at least partially influenced by the specific content of conspiracy theories. For example, Imhoff and Lamberty (2020) found that conspiracy theories related to COVID-19 can prompt different behaviors. In fact, during the COVID-19 pandemic different conspiracy theories arose, some of them focused on the idea that COVID-19 is actually a hoax, whereas other theories suggest that the virus was purposely fabricated in laboratories. While beliefs in the former conspiracy theories are associated with noncompliance with health-protecting behaviors, beliefs in the latter conspiracy theories showed the opposite relationship. Other research supports the idea that conspiracy theories can have positive effects as they can challenge hierarchies, encourage governments to be more transparent, highlight official versions of events, open new discussions, and uncover real conspiracies (Clarke, 2002; Miller, 2002; Swami & Coles, 2010). In sum, previous research did not exclude that conspiracy beliefs can lead to positive behaviors and highlighted that beliefs in different conspiracy theories can lead to different behavioral outcomes. However, it is possible that conspiracy beliefs prompt tribalism, intended as favoritism for the ingroup and prejudice toward a specified outgroup. Conspiracy theories indeed highlight the presence of hostile coalitions and derogate members of outgroups. Thus, behavioral responses follow the logic of tribal biases: information provided by outgroup members is neglected or challenged, and collective actions are taken to challenge the derogated outgroup. For example, conspiracy beliefs about pharmaceutical industries may lead to vaccine hesitancy, but at the same time, conspiracy beliefs about economic élites can lead to collective actions against their power. Thus, in addition to focusing on whether conspiracy beliefs lead to positive or negative consequences, it may be interesting to understand the features of the process that leads to a behavioral outcome from conspiracy beliefs. Indeed, based on the tribal bias hypothesis (Clark et al., 2019), the prediction is that

conspiracy beliefs lead to decisions based on group affiliation and social influences rather than on a cold analysis of the retrieved information. In this thesis, I tried to provide preliminary evidence for a link between conspiracy thinking and tribalism. Indeed, in Chapter 3 I tested whether conspiracy beliefs are associated with specific collective actions that challenge specific outgroups. Moreover, I tested whether the attitude toward a specific policy, namely, taxation, is differently associated to conspiracy beliefs based on the targeted outgroup (i.e., government vs. economic élites). Finally, I tested whether conspiracy beliefs are associated with reduced COVID-19 vaccine compliance through distrust toward another targeted outgroup, namely, scientists, independently from the degree of risk perception.

### **Communicating conspiracy theories**

Conspiracy beliefs are a psychological concept related mostly to the receivers of conspiracy theories. However, to fully understand the conspiracy-related phenomena, it is important to highlight the important aspects of the other actors involved in the communication process, including the senders, those that create and/or share conspiracy theories, the messages, namely conspiracy theories, and the means of communication. While there is rich scientific literature about antecedents and consequences for those who endorse a proposed conspiracy narrative, little is known about the characteristics of people that actively communicate conspiracy theories and conspiratorial messages. While it is plausible that conspiracy theories are shared and spread by people who believe in them, historical evidence shows that conspiracy theories are used for propaganda (Fay, 2019). Indeed, politicians may use conspiracy narratives in order to attract voters that have epistemic, existential, and social needs. Moreover, the use of conspiracy theories can be based on the intention of confronting dominant ideologies or political rivals. Finally, the spreading of conspiracy theories may be a strategy to signal loyalty to ingroup members, and conspiracy theories can be used to

communicate potential common values, and the intention to coordinate to achieve common goals (Clark et al., 2019). However, it is unclear whether this strategy is applied deliberately.

Research related to the communication of conspiracy theories reported that several persuasive strategies are frequently used. Vaccine skeptical sites tend to use false balanced information, as they proposed to the users both the mainstream scientific version and the conspiracy theory (Grant et al., 2015). Moreover, it appears that people advocating conspiracy theories focus their communication on appearing rational and open-minded (Wood & Douglas, 2013). However, it is important to highlight that many scholars criticized the conceptual fuzziness related to the definition of conspiracy theories, which are often used interchangeably with the concept of false information (Rojecki & Meraz, 2016; Schatto-Eckrodt et al., 2020). More research is needed to understand what the relationship between conspiracy theories and fake news is. In this thesis I started to explore the shapes of how conspiracy narratives are spread in online communication. First, I analyzed the prevalence of conspiracy narratives within fake news articles about COVID-19. After that, I explored how conspiracy rhetoric is used in political social media communication, and whether these narratives are linked to populist rhetoric and the popularity of messages. Then I was interested to explore the psycholinguistic differences among the communication used in a Reddit conspiracy community in comparison with other Reddit communities related to the topics of politics, debunking, and casual conversation. Finally, I experimentally tested whether messages adopting a conspiracy rhetoric were more likely to be appreciated, commented, and shared.

## **Chapter 2. Environment and individuals: antecedents of conspiracy beliefs**

The endorsement of conspiracy narratives and theories is based on interactions between the individuals and social contexts. In other words, conspiracy beliefs can be conceptualized as individuals' responses to broader socio-structural characteristics. Thus, the understanding of conspiracy beliefs cannot ignore the analysis of individuals' psychological processes and how individuals interpret the environment in which they live.

To understand how the social environment can fuel the belief in conspiracy theories, it is instructive to reconsider the functions that conspiracy theorizing promises to fulfill for individuals. According to Douglas, Sutton, and Cichocka (2017), conspiratorial explanations hold the promise to satisfy three psychological motives. First, conspiracy theories refer to easy-to-understand explanations of complex societal events. As people need to give meaning to social reality, to develop a stable, accurate, and internally consistent understanding of the world (Heider, 1958), they can be particularly attracted by the simple explanations provided by conspiracy theories. Coherently, believing in conspiracy theories increases when people are threatened by uncertainty. Second, conspiratorial thinking fulfills an existential need related to the need to feel safe and secure and to feel in control of the environment. Third, conspiratorial thinking fulfills the social need to maintain a positive image of the self and the in-group. While individuals have different degrees of these psychological needs, the features of the social environment – both actual or perceived – can prompt these needs. In particular, psychological needs are frustrated when people perceive that the society in which they live is characterized by the disruption of the social fabric and when leadership is perceived as illegitimate and ineffective, or, in other words, when people perceive anomie (Abalakina-Paap et al., 1999).

Historically, conspiracy beliefs flourish in times of societal crises (van Prooijen & Douglas, 2017), namely, contexts that are generally characterized by high anomie. Importantly, anomie is related to a lower sense of personal and collective control and security

(Bjarnason, 2009; Hilbert, 1986), reduced perception of meaning in life (Thorlindsson & Bernburg, 2004), reduced sense of community (Fischer, 1973) and lower self-esteem (Dobson et al., 1979). In that sense, anomie provides a fertile ground for conspiratorial thinking to emerge because it holds the promise of fulfilling causal explanation needs for events. Such explanations allow for the development of a stable, accurate, and internally consistent understanding of the world (Douglas et al., 2017; Leman & Cinnirella, 2013; Salvador Casara et al., 2019), the desire to feel safe and secure and to feel in control of the environment (Abalakina-Paap et al., 1999; Grzesiak-Feldman, 2013), and the need to maintain a positive image of the self and the in-group (Graeupner & Coman, 2017; Mashuri & Zaduqisti, 2015). To sum up, I here claim that conspiracy beliefs arise when situations or socio-structural conditions trigger psychological needs because they prompt anomie. To test this statement, I focused on a relevant socio-structural feature of modern societies, namely, economic inequality.

Economic inequality (i.e., the unequal distribution of economic resources) is a worldwide concern. The 2019 Oxfam's annual report states that in 2019 the 2153 world's richest people owned the same amount of wealth as the poorest 4.6 billion (Oxfam, 2020). Furthermore, economic inequality is increasing and, according to the Organization for Economic Co-operation and Development (OECD, 2011), income inequality is at its highest level since 1950 in the OECD countries. Economic inequality has been found to be associated with several negative consequences. First, economic inequality correlates negatively with well-being and health (Wilkinson & Pickett, 2017) and it is linked to higher levels of anomie (Teymoori et al., 2017; Sprong et al., 2019). Indeed, economic inequality highlights social categorization in terms of wealth groups, prompts intergroup conflicts, and ingroup biases. Coherently, when people perceive that wealth differences are large, it is more likely that they perceive the leadership as illegitimate (Sprong et al., 2019). While this may be more relevant for people in the low-status group, it is important to notice that higher economic inequality

implies that fewer people possess most of the wealth, therefore the large majority of the population will belong to the low/middle-status group. Moreover, economic inequality can impact the perception of disintegration of the social fabric even for members of the wealthier group, as the implications for losing status are more relevant when the differences among groups are larger. Indeed, when economic inequality is salient, competition becomes particularly relevant and people are less likely to cooperate (Sánchez-Rodríguez et al., 2019) and trust others (Fiske et al., 2012).

The primary psychological consequence of anomie is that people perceive that important psychological needs are not satisfied. Indeed, anomie is related to a lower sense of personal and collective control and security (Bjarnason, 2009; Hilbert, 1986), reduced perception of meaning in life (Thorlindsson & Bernburg, 2004), reduced sense of community (Fischer, 1973), and lower self-esteem (Dobson et al., 1979). It is important to highlight that I am not arguing that conspiracy beliefs actually satisfy these psychological needs, but rather that they are attractive for people with these needs. In fact, rather than reducing them, conspiracy beliefs have been found to increase uncertainty (Jolley & Douglas, 2014), decrease a sense of control and autonomy (van Prooijen & Acker, 2015), and increase distrust toward other people and groups (Einstein & Glick, 2015). In other words, I argue that conspiracy theories are responses to unsatisfied psychological needs, whereas it is unclear whether they solve or exacerbate them.

However, it is important to acknowledge that other strategies are available to satisfy psychological needs and to cope with the psychological consequences of economic inequalities (e.g., justify the economic system, Goudarzi et al., 2020; believe in science, Farias et al., 2013; believe in religion, Solt et al., 2011), and that individuals vary in their tendency to hold conspiracy beliefs (Brotherton et al., 2013). Thus, it is plausible that the impact of economic inequality on conspiracy beliefs is particularly relevant for people already holding a

conspiracy worldview. Coherently with the adaptive-conspiracism hypothesis (van Prooijen & van Vugt, 2018), conspiracy beliefs are the result of an interaction between a more stable conspiracy attitude and socio-structural economic inequality.

Based on this corpus of evidence, I predict that economic inequality increases conspiracy beliefs, and I further argue that anomie mediates this relationship. In the following studies, I first investigated whether actual economic inequality is associated with stronger conspiracy theorizing at the country-level (Study 1a, 1b, 1c). Then, I tested the same relationship using a cross-sectional design at the individual level, and I tested the potential mediation role of anomie (Study 2). Moreover, I experimentally tested if perceived economic inequality affects conspiracy beliefs and if anomie mediates this effect (Study 3a, and 3b). Furthermore, I investigated the role of individual characteristics, and in particular the conspiracy worldview, and therefore I tested if participants' conspiracy worldview moderates the effects of perceiving economic inequality (Study 4a and 4b)<sup>4</sup>. Finally, I tested whether social class is associated with endorsement of conspiracy theories (Study 5).

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<sup>4</sup> I want to give some special thanks to prof. Jetten for her fundamental help she provided in Studies 1a, 1b, 1c, 6, 7a, 7b, 8a, and 8b.

## **Study 1a, 1b and 1c. Country-level economic inequality and conspiracy beliefs**

*Another analysis of this study is published in:*

Salvador Casara, B. G., Suitner, C., & Jetten, J. (2022). The impact of economic inequality on conspiracy beliefs. *Journal of Experimental Social Psychology, 98*, 104245.

The goal of these studies was to explore the relationship between actual economic inequality and conspiracy beliefs (H1).

### **Method**

In Study 1a, 1b, and 1c, I reanalyzed existing data sets to cross indices of structural economic inequality, measured with the GINI index, with country-level scores of conspiracy beliefs retrieved from different studies and using different measures. Specifically, In Study 1a, I retrieved conspiracy beliefs scores from a dataset including data from 25 countries (see Hornsey et al., 2018). In Study 1b, I retrieved conspiracy beliefs scores from a dataset including data from 18 countries (see Adam-Troian et al., 2020, Study 2b). Finally, in Study 1c, I retrieved conspiracy beliefs scores from the YouGov-Globalism Project 2020 from a dataset including data from 20 countries.

### **Measures**

#### ***Economic Inequality***

Economic inequality was measured using the GINI index estimates of the World Bank. The Gini index is a measure of statistical dispersion of income which is widely used to represent economic inequality (e.g., Holland, Peterson, & Gonzalez, 2009; Nishi, Shirado, Rand, & Christakis, 2015; Pickett & Wilkinson, 2015). Its scores range from 0 to 1, with higher scores indicating higher economic inequality. In particular, for each study they were used the most available GINI score matching the year of the conspiracy beliefs measurement. Therefore, for Study 1a were used the most recent available GINI scores from 2016 ( $M =$

37.17,  $SD = 6.36$ ), for Study 1b ( $M = 32.83$ ,  $SD = 6.65$ ) and Study 1c ( $M = 35.5$ ,  $SD = 6.17$ ) I used the most recent available GINI scores from 2020. These years were used to match the year of measurement for conspiracy beliefs scores.

### ***Conspiracy Beliefs***

The three studies used different measures of conspiracy beliefs. Specifically, in Study 1a, conspiracy beliefs were measured with items based on worldwide popular conspiracy theories (i.e., about the assassination of President John Kennedy, the death of Princess Diana; the existence of a New World Order, and about the 9/11 terrorist attacks; 5-point Likert from 1 “*strongly disagree*” to 5 “*strongly agree*”,  $M = 3.01$ ;  $SD = 0.28$ ) from Lewandowsky and colleagues (2013). In Study 1b, conspiracy beliefs were assessed with the Conspiracy Mentality Questionnaire (Bruder et al., 2013). This measure contains 5 items on an 11-point Likert scale (e.g., “events which superficially seem to lack a connection are often the result of secret activities”; from 1 “0% completely unlikely” to 11 “100% completely likely”). Finally, in Study 1c, conspiracy beliefs were measured with five items based on worldwide popular conspiracy theories (about a single secret group in charge of all the world; global warming; alien contact; AIDS virus; and moon landing; 5-point Likert from 1 “Definitely false” to 5 “Definitely true”).

## **Results**

Non-statistically significant positive correlations between GINI and conspiracy beliefs scores were found in all three studies (Study 1a,  $r = .35$ ,  $p = .131$ ; Study 1b,  $r = .40$ ,  $p = .10$ ; Study 1c,  $r = .32$ ,  $p = .17$ ). It is due to notice that the access to only country-level data limited the number of observations, which limited the achieved power. According to a post-hoc sensitivity analysis, with  $1-\beta = .80$  and these sample sizes, it was possible to detect only  $r > .46$ . Thus, I conducted a meta-analysis to overcome this limit and whether the studies collectively support the hypothesized association between economic inequality and conspiracy

beliefs. Consistent with the hypothesis, the meta-analysis revealed that, across the three studies, GINI was reliably associated with conspiracy beliefs ( $r = .36, p = .009$ , see Figure 2).

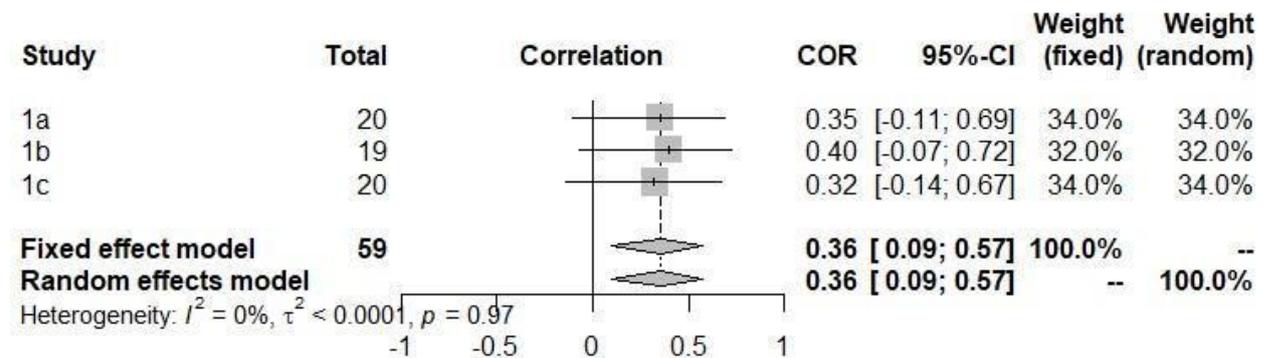


Figure 2. Meta-analysis of the association between economic inequality and conspiracy beliefs.

Moreover, a closer inspection of the three datasets revealed that Brazil’s GINI scores were outliers and influential cases (scores were higher than 2 standard deviations from the mean, all Cook’s distances  $> 1.49$ ) in all three studies. After the elimination of these outliers, GINI scores were reliably and strongly associated with conspiracy beliefs in all three studies (Study 1a,  $r = .64, p < .001$ ; Study 1b,  $r = .49, p = .02$ ; Study 1c,  $r = .54, p = .009$ ).

### Discussion

Overall, the results provide converging evidence toward the hypothesis that economic inequality leads to more conspiracy beliefs at the country-level. From three independent datasets, which used different measures of conspiracy beliefs and involved somewhat different countries and different years, we found effect sizes consistently around  $r = .35$ . Moreover, all datasets shared the same outlier, namely, observations from Brazil. Once Brazil’s data were removed, all effects were statistically significant with a stronger and consistent association.

## **Study 2. Perceived economic inequality and conspiracy beliefs**

*Another analysis of this study is published in:*

Salvador Casara, B. G., Suitner, C., & Jetten, J. (2022). The impact of economic inequality on conspiracy beliefs. *Journal of Experimental Social Psychology, 98*, 104245.

In this study, my goal was to establish the link between economic inequality and conspiracy beliefs. Moreover, I wanted to explore whether the association between these variables is mediated by anomie. Thus, I predicted that the perception of economic inequality should correlate positively with anomie (H1), which in turn will mediate the association between subjective economic inequality and conspiracy beliefs (H2).

### **Method**

#### **Participants**

In total, 515 Australian citizens took part in the study<sup>5</sup>. Participation was voluntary and anonymous. Data were collected online via Qualtrics Panels LLC. The age of the sample ranged from age 19 to 80 ( $M = 43.47$ ,  $SD = 16.41$ ) and included 263 women and 252 men. The sample size was determined by financial considerations: Qualtrics charged AU\$11.50 per participant and the budget allowed for 500 participants. The results of a post-hoc sensitivity power analysis with  $N = 515$  and  $1-\beta = .80$  showed that the minimum effect detectable was  $r = .11$  for correlations. The study was approved by the University of Queensland Ethics Committee of Psychological Research.

#### **Measures**

##### ***Economic inequality***

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<sup>5</sup> The study was part of the same data collection reported in the Study 2 of Sprong and colleagues (2019).

We measured *perceived inequality* using the measure reported in Sprong et al. (2019). Participants were presented with a table of five rows showing five wealth categories: “very poor”, “poor”, “average in wealth”, “wealthy”, and “very wealthy”. They were asked to “think of 100 citizens in their country” and asked “how many of these 100 people would be classified into different wealth categories.”. Participants estimated the number of people in each wealth category and wrote the number in a box at the end of each row, with the five estimates adding up to 100 people. The perceived inequality index was calculated in the same way as the calculation of the Gini coefficient, and the scores could range from 0 to 1, with a higher score indicating that participants perceived more economic inequality in their country. Specifically, four steps were taken to calculate the subjective Gini (see also Sprong et al., 2019 Supplementary materials). First, the five wealth categories were valued as 1, 2, 3, 4, and 5 units of wealth. Second, using the responses to the wealth distribution measure (i.e., how many people fall in each wealth category), a histogram of the cumulative wealth distribution was plotted. Third, both a line of equality and the Lorenz curve were drawn. Given the fact that there were only five observations per participant (i.e., people only had to estimate the size of 5 wealth groups), the Lorenz curve was simulated by connecting the diagonals of each column’s protruding part. Finally, the subjective Gini coefficient was calculated as the ratio of area A over (area A + area B).

In this sample, the perceived inequality index was on average .20 and ranged from .00 to .36 ( $SD = 0.07$ ), with higher scores indicating that participants perceived higher levels of inequality in Australia.

### ***Conspiracy beliefs***

In order to assess conspiracy beliefs, participants responded to a single item. This item was validated in French and English, and 3 studies recognized its reliability and convergent, discriminant, and predictive validity (Lantian et al., 2016; “Some political and social events

are debated, for example: 09/11 attacks, the death of Lady Diana, the assassination of John F. Kennedy. It is suggested that the “official version” of these events could be an attempt to hide the truth from the public. This “official version” could mask the fact that these events have been planned and secretly prepared by a covert alliance of powerful individuals or organizations, for example, secret services or government. What do you think?”). Participants had to indicate to what extent the following sentence exemplifies how they think about this: “I think that the official version of the events given by the authorities very often hides the truth”. Responses could range from “completely false” (1) to “completely true” (9). In this sample, conspiracy beliefs scores were on average 6.18 ( $SD = 2.01$ ).

### ***Anomie***

A 12-items on a 7-points Likert scale was used to assess anomie (Teymoori et al., 2016). The following are 4 examples of the items: “In Australia today, everyone thinks of him/herself and does not help others in need”, “In Australia today, people think that there are no clear moral standards to follow.”, “In Australia today, the government laws and policies are effective (reverse-coded)” and “In Australia today, the government is legitimate (reverse-coded)”. Reliability was good ( $\alpha = .80$ ). In this sample, the levels of anomie were on average 4.43 ( $SD = 0.81$ ).

### ***Political orientation, gender, age, education, and income***

Political orientation (two items on a scale ranging from “left-wing” to “right-wing” and from “very liberal” to “very conservative”,  $r = .57$ ,  $p < .001$ ,  $M = 3.99$ ,  $SD = 1.19$ ), gender, age, education, and personal annual income were also measured.

## **Results**

A Pearson’s  $r$  confirmed a positive association between perceived economic inequality and conspiracy beliefs (H1),  $r = .15$ ,  $p < .001$ ,  $CI = [.06, .23]$ . This correlation is statistically

significant even after controlling for political orientation, gender, age, education level and personal annual income (partial  $r = .13$ ,  $p < .001$ ,  $CI = [.04, .22]$ ).

Moreover, I ran a mediation model using the software JASP (Love et al., 2019) with bootstrapping for 5,000 resamples and 95% confidence intervals (Preacher & Hayes, 2008). The mediation model supported that mediation hypothesis: subjective inequality had an indirect effect via anomie on conspiracy beliefs: indirect effect:  $b = 1.55$  ( $SE = 0.30$ ), 95%  $CI = [1, 2.19]$ . The total effect was fully mediated: direct effect:  $b = 0.66$  ( $SE = 0.67$ ), 95%  $CI = [-0.54, 2]$ , total effect;  $b = 2.21$  ( $SE = 0.63$ ), 95%  $CI = [1.05, 3.61]$  (see Figure 3).

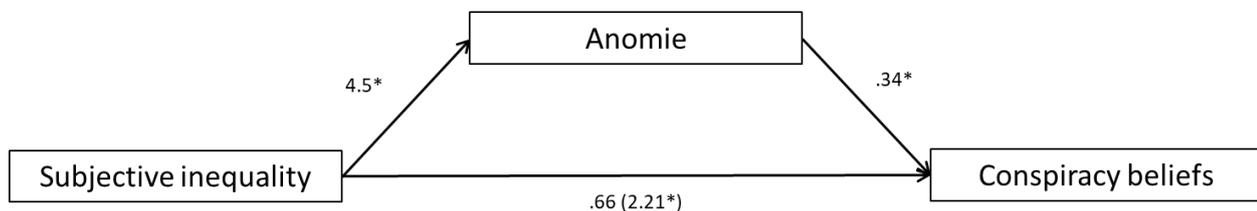


Figure 3. Path model for conspiracy beliefs with standardized coefficients.

## Discussion

The hypothesis that the perception of economic inequality (calculated in the same way as the Gini coefficient) is positively associated with conspiracy beliefs in a real-world context was supported by this study. Moreover, the association was fully mediated by anomie.

While the study has good ecological validity, causal evidence cannot be provided for the inequality-conspiracy beliefs link. To overcome this limit, I ran four experiments.

### **Study 3a. Manipulation of economic inequality and conspiracy beliefs**

In this experiment, perceived inequality was manipulated using the Bimboola paradigm (Sánchez-Rodríguez et al., 2019; Sprong et al., 2019): An experimental procedure where participants have to imagine their life in a fictional scenario characterized by high (vs. low) levels of economic inequality. I expected that participants assigned to the high inequality (vs. low inequality) condition would have higher levels of conspiracy beliefs (H1). Moreover, I predicted that the high inequality condition would increase the perception of anomie, which will mediate the effect of the manipulations on conspiracy beliefs (H2).

#### **Method**

##### **Participants**

A sample of 96 (63 females, 33 males) undergraduate students (age  $M = 21.11$ ,  $SD = 6.03$ ) were recruited for this experiment, during the same data collection and experiment reported in Study 3a of Sprong and colleagues (2019). Participants were rewarded with course credit. Using a post-hoc sensitivity power analysis, I estimated that, with  $N = 96$  and  $1-\beta = .80$ , the minimum effect detectable was  $d = .58$  for t-tests, and  $r = .28$  for correlations. The study was approved by the University of Queensland Ethics Committee of Psychological Research.

##### **Manipulation of Inequality**

The study was conducted online via Qualtrics Panels LLC. After participants gave their agreement to take part of the experiment, they were requested to imagine that they were going to live in a fictional society named Bimboola (Sánchez-Rodríguez et al., 2019; Sprong et al., 2019). Participants were acknowledged that Bimboola is a society where citizens can be members of one of three income groups. All participants were informed to think of themselves as belonging to the middle-class group, which earned 40,000 Bimbolean Coins (BC) per month. Participants were then randomly assigned to one of two possible conditions (high vs.

low inequality condition). In the high inequality condition ( $N = 45$ ), the wealthiest group was presented as extremely wealthy and the poor group as extremely poor, whereas, in the low inequality condition ( $N = 51$ ), there were small differences in income among the three groups in Bimboola. Furthermore, to improve the realism of the experiment, participants had to imagine their life in Bimboola and they were asked to pursue the essentials in life such as a place where live, a holiday, and a means of transport. Participants were able to pick only the articles that the middle-income group could afford and the houses, cars, and holidays available were the same in the low and high inequality conditions. However, the two experimental conditions manipulated the quality and disposal of items for the poorest and the wealthiest groups.

In the low inequality condition, the items for the poor group were only marginally lower quality than those obtainable by the middle class, and similarly, the choices available for the wealthy group were only a little better quality than those available to the middle class. However, in the high inequality condition, the differences in terms of quality for the items available to the different wealth groups were extremely large (Sánchez-Rodríguez et al., 2019; Sprong et al., 2019).

## **Measures**

### ***Perceived economic inequality***

Two items were used for the manipulation check of the perception of economic inequality: “To what extent is Bimboola’s economic distribution unequal?” ( $1 = \textit{not unequal at all}$ ,  $9 = \textit{very unequal}$ ) and “To what extent is Bimbooleen society equal?” ( $1 = \textit{not equal at all}$ ,  $9 = \textit{very equal}$ ). Moreover, I checked whether participants correctly remembered which group they had been assigned to using the question “which income level have you been assigned

to?”. In this sample, perceived economic inequality scores were on average 4.61 ( $SD = 1.80$ ), and perceived economic equality scores were on average 3.10 ( $SD = 1.63$ )

### ***Conspiracy beliefs***

Sixteen items on a Likert scale ranging from 1 (minimum agreement) to 7 (maximum agreement), adapted from Brotherton et al. (2013), measured conspiracy beliefs (i.e., “New and advanced technology which would hurt current industry is being suppressed”, “Certain significant events have been the result of the activity of a small group who secretly manipulates world events”, “A lot of things get covered up here in Bimboola”;  $\alpha = .92$ ). As they had good reliability, I averaged the items to compute a measure of conspiratorial thinking. In this sample, conspiracy beliefs scores were on average 4.34 ( $SD = 1.15$ ).

### ***Anomie***

As in Study 2, anomie was measured using 12-items on a 7-points Likert scale (Teymoori et al., 2016). Reliability was good ( $\alpha = .91$ ). In this sample, anomie scores were on average 4.14 ( $SD = 1.12$ )

## **Results**

### **Manipulation check**

Participants in the high inequality condition perceived higher levels of economic inequality in Bimboolean society ( $M = 5.43$ ,  $SD = 1.75$ ),  $t(95) = 5.4$ ;  $p < .001$ ;  $d = 1.1$ , and lower levels of economic equality ( $M = 2.29$ ,  $SD = 1.38$ ),  $t(95) = -6.55$ ,  $p < .001$ ;  $d = -1.33$ , compared with those in the low inequality condition ( $M = 3.71$ ,  $SD = 1.33$ ;  $M = 4.11$ ,  $SD = 1.37$ , respectively).

### **Conspiracy beliefs**

Participants in the high inequality condition reported higher levels of conspiracy beliefs ( $M = 4.11$ ,  $SD = .87$ ) compared to those in the low inequality condition ( $M = 3.3$ ,  $SD = 1.04$ ),  $t(95) = 7.52$ ,  $p < .001$ ;  $d = .8$ ); thus, supporting H1.

## Mediation analysis

Similar to Study 2, it was tested whether anomie mediated the relation between manipulated levels of inequality and conspiracy beliefs. The mediation model supported that the economic inequality condition had an indirect effect via anomie on conspiracy beliefs: indirect effect:  $b = .43$  ( $SE = 0.13$ ), 95%  $CI = [.17, .76]$ . The total effect was fully mediated: direct effect:  $b = 0.33$  ( $SE = 0.20$ ), 95%  $CI = [-0.90, .83]$ ; total effect;  $b = 0.76$  ( $SE = 0.19$ ), 95%  $CI = [0.40, 1.14]$  (see Figure 4).

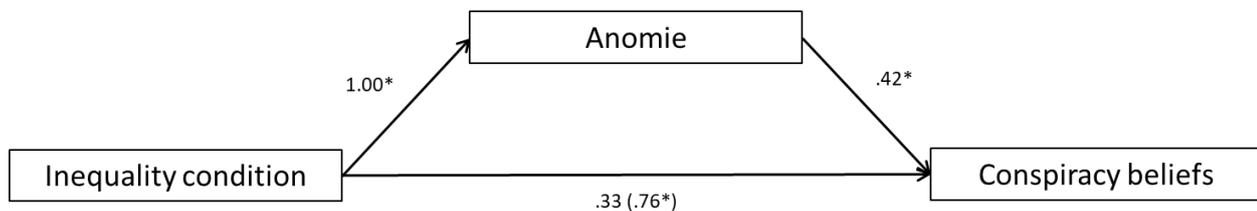


Figure 4. Path model for conspiracy beliefs with standardized coefficients.

## Discussion

As expected, the high (vs. low) economic inequality condition led to stronger support of conspiracy beliefs about the imagined society of Bimboola via anomie. However, this study has a number of limits. First, our sample was small and even though we found strong effects, the effect size may have been overestimated by the inadequate sample size (Levine et al., 2009). To overcome these limits, I tried to replicate the results by conducting another sufficiently powered study.

### **Study 3b. Economic inequality and conspiracy beliefs: a first replication**

*Another analysis of this study is published in:*

Salvador Casara, B. G., Suitner, C., & Jetten, J. (2022). The impact of economic inequality on conspiracy beliefs. *Journal of Experimental Social Psychology, 98*, 104245.

This study was conducted to replicate the previous one and therefore to corroborate the hypothesized causal relationship between the perception of economic inequality and conspiracy beliefs (H1), and to confirm the mediation role of anomie (H2), using a larger sample and involving a different population.

#### **Method**

##### **Participants**

A sample of 296 U.S. residents were collected online via MTurk, during the same data collection and experiment reported in Study 3b of Sprong and colleagues (2019). Participants' age ranged from age 23 to 80 ( $M = 41.53$ ,  $SD = 11.11$ ), and the sample included 161 women and 135 men. From a post-hoc sensitivity power analysis with  $N = 100$  and  $1-\beta = .80$  emerged that the minimum effect detectable was  $d = .32$  for t-tests.

##### **Measure and Procedure**

The procedure was the same as Study 3a. Specifically, in Study 3b, I used an identical manipulation of economic inequality and the same variables and measures were used as in Study 3a. In this sample, conspiracy beliefs scores were on average 3.30 ( $SD = 1.40$ ), and anomie scores were on average 3.65 ( $SD = 1.40$ ). Like in the previous study, the reliability of the conspiracy measure and anomie were adequate ( $\alpha = .97$ ;  $\alpha = .96$ ).

## Results

### Manipulation check

Participants in the high inequality condition perceived higher levels of economic inequality in Bimboolean society ( $M = 6.5$ ,  $SD = .92$ ),  $t(294) = 30.17$ ;  $p < .001$ ;  $d = 3.50$ , and lower levels of economic equality ( $M = 1.66$ ,  $SD = 1.03$ ),  $t(95) = -25.45$ ,  $p < .001$ ;  $d = -2.96$ , compared with those in the low inequality condition ( $M = 2.94$ ,  $SD = 1.10$ ;  $M = 4.89$ ,  $SD = 1.03$ , respectively).

### Conspiracy beliefs

Participants in the high inequality condition reported higher levels of conspiracy beliefs ( $M = 4.01$ ,  $SD = 1.3$ ) compared to those in the low inequality condition ( $M = 2.60$ ,  $SD = 1.30$ ),  $t(294) = 10.00$ ,  $p < .001$ ;  $d = 1.16$ ); thus, supporting H1.

### Mediation analysis

As I did in the previous studies, I examined whether anomie mediated the relation between manipulated levels of inequality and conspiracy beliefs. The mediation model supported that the economic inequality condition had an indirect effect via anomie on conspiracy beliefs: indirect effect:  $b = 1.09$  ( $SE = 0.10$ ), 95%  $CI = [.88, 1.31]$ . The total effect was fully mediated: direct effect:  $b = -0.08$  ( $SE = 0.12$ ), 95%  $CI = [-0.31, .14]$ ; total effect;  $b = 1.00$  ( $SE = 0.10$ ), 95%  $CI = [0.80, 1.20]$  (see Figure 5).

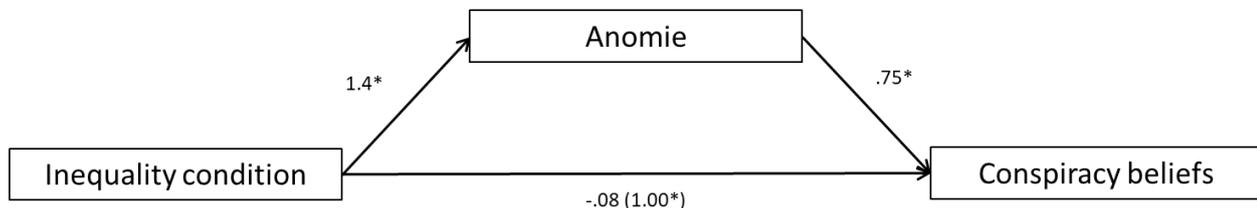


Figure 5. Path model for conspiracy beliefs with standardized coefficients.

## Discussion

Overall, Study 3b was a successful replication of Study 3a, and it confirms once again that the perception of economic inequality has a strong effect on conspiracy beliefs. The strong effects found in these studies provide evidence that socio-structural factors such as economic inequality cause and increase conspiracy beliefs. Social cues are thus used by participants when they have to attribute the presence of conspiracies in that environment. The results of these studies suggest that economic inequality is a social asset that stimulates conspiracy thinking, through the increased anomie.

However, as already mentioned, there is robust evidence that people differ in their tendency to believe in conspiracies and that a more general conspiracy worldview is highly predictive of conspiracy beliefs (Uscinski et al., 2016). Based on the adaptive-conspiracism hypothesis, the attribution of conspiracies to a situation or a context is the result of environmental cues and individual preferences toward conspiracy narratives. For this reason, in Studies 8a and 8b, I included and tested conspiracy worldview as possible moderator, in order to consider this individual difference.

**Study 4a. Exploring the interaction between economic inequality and conspiracy worldview on conspiracy beliefs**

*Another analysis of this study is published in:*

Salvador Casara, B. G., Suitner, C., & Jetten, J. (2022). The impact of economic inequality on conspiracy beliefs. *Journal of Experimental Social Psychology, 98*, 104245.

In Study 4a, I used a shorter and simpler version of the Bimboola paradigm and I assessed conspiracy beliefs with four new items. This new experiment provides the advantage to test a conceptual replication of previous findings, and therefore provides evidence for the generalizability of previous results. Furthermore, as this study involves a third population, namely, Italian students, it provided an initial test of the cross-cultural generalizability of the findings.

Once again, I expect that perceiving high economic inequality enhances the belief in conspiracies (H1). Moreover, in line with Van Prooijen and van Vugt (2018), conspiracy beliefs are affected by more stable individual features (conspiratorial worldview) that functions as a conspiracy-detector system that is activated by socio-structural cues (i.e., economic inequality). Conspiracy worldview is here defined as a general attitude about how frequent conspiracies happen in the real world. Different from the conspiracy beliefs measures, which here refer to context-specific evaluations of a given scenario, conspiracy worldview is about a more general and stable attitude (Albarracin & Shavitt, 2018).

I, therefore, expected that people with higher levels of conspiratorial worldview should be more sensitive to economic inequality, providing further support that beliefs associated with a conspiratorial worldview help explain the relationship between inequality and conspiracy beliefs.

## Method

### Participants

This experiment was conducted online using Qualtrics survey software. Sixty-four Italian psychology students took part in the study. Eight participants failed the manipulation check and were excluded. The final sample comprised 56 participants ( $M_{\text{age}} = 20.75$ ;  $SD_{\text{age}} = 2.96$ ). The sample included 45 women and 11 men. The results of a post-hoc sensitivity power analysis with  $N = 56$  and  $1-\beta = .80$  showed that the minimum effect detectable was  $d = .76$  for t-tests and  $f^2 = .21$  for regressions. The Padua Ethics Committee of Psychological Research approved the study.

### Measures and Procedure

A simplified version of the Bimboola paradigm was used in this study. Participants first read the informed consent and had to agree to participate, then they were randomly assigned to be part of one of two experimental conditions. Participants read a short text portraying the fictional Western society of Kalo. In both conditions, participants were asked to imagine their life in Kalo. In the high (vs. low) inequality condition, the society was described as characterized by the presence of a high (vs. low) wage gap between business owners/managers and workers, with an economy based on few multinational companies' activities (vs. based on several small and medium companies' activities), and as having a flat tax (vs. progressive) rate. We included a two-item manipulation check assessing the perceived economic inequality in Kalo ("There are strong differences between the managerial and the working class in Kalo"; "The wealth differences among Kalo's citizens are small";  $r = .92$ ). Participants were excluded when they answered these items inconsistently (e.g., marking "Totally agree" to both the questions). Furthermore, because the manipulation states that managers earn one hundred times more than the workers, participants were also excluded when they gave a response lower than 51, on a scale ranging from 0 ("Totally disagree") to 100 ("Totally agree"). After that, we asked participants to answer to items related to conspiracy beliefs in Kalo and to attribute

features to Kalo's society (level of democracy, interpersonal trust, ecologism, and religiosity), the order of these items was randomized. Finally, participants had to answer the items about conspiracy worldview, political orientation, sex, age, and education.

### ***Conspiracy Beliefs***

Conspiracy beliefs were operationalized as beliefs about powerful groups acting in secret in order to achieve their goals even when they are deliberately harmful to the population of Kalo. Participants were asked to indicate the extent to which they agreed with the following four items on a scale ranging from 0 (minimum agreement) to 100 (maximum agreement): “Politicians of Kalo aim to maintain their power and pursue their interests even when this deliberately harms the rest of the population”; “In Kalo society, the pharmaceutical industry aims to meet their economic and political goals, even when they are aware that their actions will harm citizens”; “Multinational companies secretly and deliberately exploit the workers and the resources of Kalo's society in order to increase their profit”; “Scientists in Kalo fabricate or exaggerate several issues in order to maintain their social status, even when they are aware that their actions have a dramatic negative effect for the citizens” ( $\alpha = .89$ ; inter-item correlation = .67). Given the good reliability and inter-item correlation, I averaged the items to compute an index of conspiracy beliefs. In this sample, conspiracy beliefs scores were on average 51.68 ( $SD = 18.69$ )

### ***Conspiratorial worldview***

General conspiratorial worldview was assessed with one question (“In the world, powerful groups secretly act in order to achieve their goals, even if they are aware that their plans will harm the rest of the population”). Responses were on a scale ranging from 0 (almost never) to 100 (very frequently). In this sample, conspiracy worldview scores were on average 67.14 ( $SD = 18.22$ ).

## Results

### Manipulation check

Participants in the high inequality condition perceived a higher wage gap between the managerial and working class ( $M = 93.73$ ,  $SD = 11.11$ ),  $t(41.85) = 8.95$ ;  $p < .001$ ;  $d = 2.342$ , and among citizens ( $M = 89.58$ ,  $SD = 14.84$ ),  $t(51.39) = 7.94$ ,  $p < .001$ ;  $d = 2.10$ , compared with those in the low inequality condition ( $M = 49.47$ ,  $SD = 24.30$ ;  $M = 50.57$ ,  $SD = 21.70$ , respectively).

### Conspiracy beliefs

Participants in the high inequality condition reported higher levels of conspiracy beliefs ( $M = 65.89$ ,  $SD = 12.27$ ) compared to those in the low inequality condition ( $M = 39.37$ ,  $SD = 13.95$ ),  $t(54) = 7.52$ ,  $p < .001$ ;  $d = 2.00$ .

### Conspiracy worldview

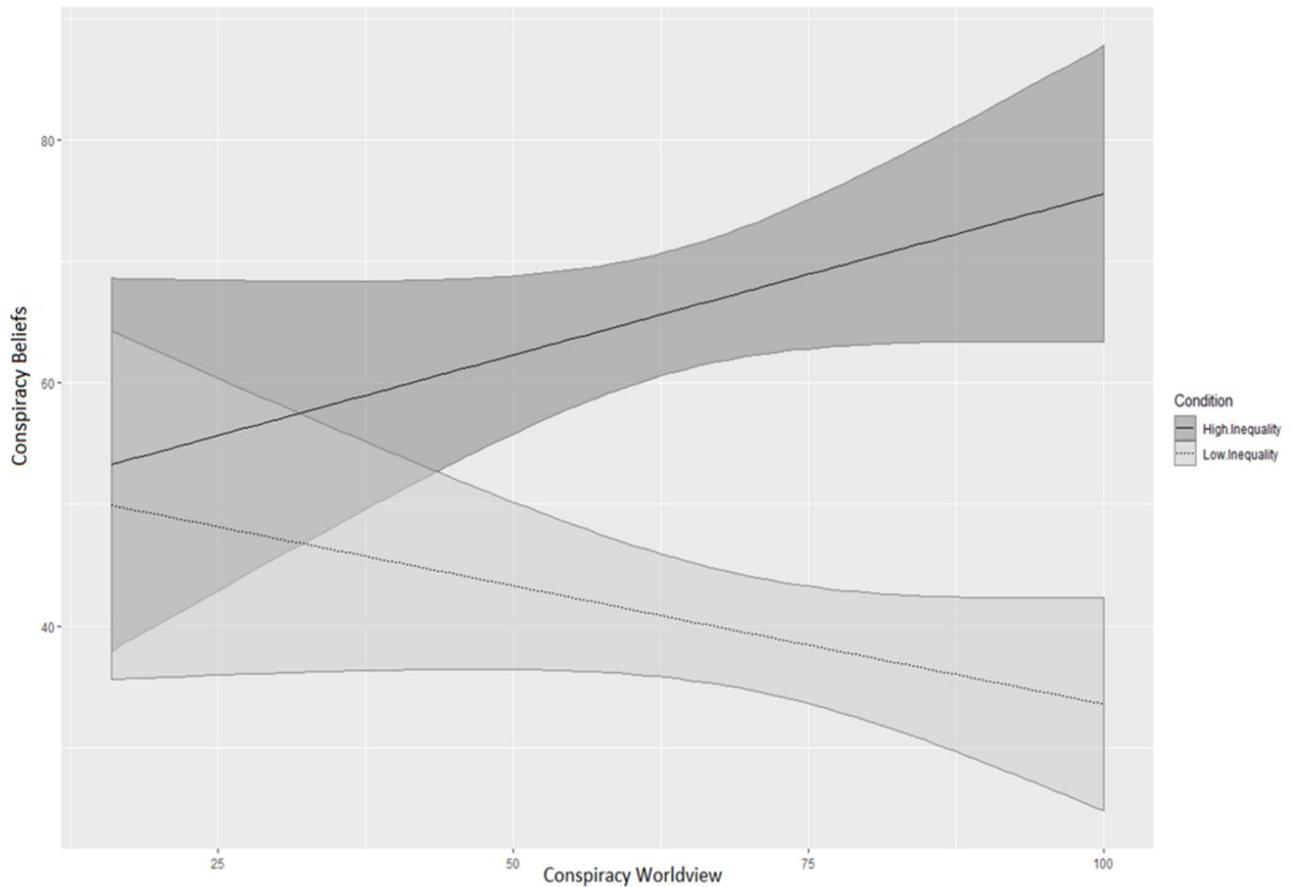
Conspiracy worldview scores did not differ between conditions ( $M_{HI} = 63.58$ ,  $SD_{HI} = 16.83$ ;  $M_{LI} = 70.23$ ,  $SD_{LI} = 19.08$ ),  $t(54) = -1.39$ ,  $p = .171$ ;  $d = -.37$ ), providing reassurance that randomization had been successful.

### *Conspiracy worldview as moderator*

I conducted a multiple linear regression to test whether conspiracy worldview moderated the effect of economic inequality on conspiracy beliefs. The result was in line with H2; the higher the conspiratorial worldview, the stronger the differences between high and low inequality in conspiracy beliefs (see Figure 6). However, the single slopes for the high economic inequality condition ( $\beta = .27$ ,  $p = .09$ ), and the low economic inequality ( $\beta = -.19$ ,  $p = .12$ ) were not statistically significant. Finally, economic inequality had a main effect on conspiracy beliefs for participants holding both low (-1SD,  $t(52) = 3.89$ ,  $p < .001$ ) or high (+1SD,  $t(52) = 6.88$ ,  $p < .001$ ) levels of conspiracy worldview.

Finally, based on the Bayes Factor, the model including conspiracy worldview as a moderator was to be preferred in comparison with the model including experimental

conditions and conspiracy worldview as independent factors ( $BF = 3.20$ ) but was equal to the model including only the experimental conditions as a predictor ( $BF = 0.83$ ).



*Figure 6.* Interaction plot of conspiracy beliefs by conspiracy worldview for high inequality and low inequality conditions.

## Discussion

As expected, the high (vs. low) economic inequality condition led to a higher endorsement of conspiracy beliefs about the society of Kalo (H1). The results of this study are in line with studies previously reported, showing a strong effect of the perception of economic inequality on conspiracy beliefs. Moreover, manipulated inequality did not affect all participants in the same way, as participants with a stronger conspiratorial worldview were

more sensitive to the high inequality manipulation in comparison with the low inequality manipulation, supporting the notion that conspiracy beliefs arise in the interaction between a conspiracy-detector system and socio-structural factors.

However, even if the findings of previous studies were corroborated and we found strong effects for most of our hypotheses, the evidence about moderation was rather inconclusive. Thus, I ran another pre-registered study whereby the sample size was decided on the basis of an a-priori power analysis.

## **Study 4b. Confirming the interaction between economic inequality and conspiracy worldview on conspiracy beliefs**

*Another analysis of this study is published in:*

Salvador Casara, B. G., Suitner, C., & Jetten, J. (2022). The impact of economic inequality on conspiracy beliefs. *Journal of Experimental Social Psychology*, 98, 104245.

The aim of Study 4b was to replicate the results of the previous study. This study was preregistered on OSF.

### **Hypotheses**

According to the pre-registered hypotheses ([https://osf.io/pa3t7/?view\\_only=c8e8afdbf7e44f648e9e8812728c0c27](https://osf.io/pa3t7/?view_only=c8e8afdbf7e44f648e9e8812728c0c27)), we predicted that participants in the high (compared to low) economic inequality condition would be more likely to endorse conspiracy beliefs about the fictional scenario (H1) and that the effect of experimental conditions would be moderated by participants' conspiratorial worldview (H2).

### **Method**

#### **Participants**

Based on a prior power analysis aimed to detect an effect size, in a mono-directional t-test, of at least  $d = .5$ , with  $1-\beta = .80$ , and  $\alpha = .05$ , we administered an online questionnaire to 104 Italian participants recruited via social media (e.g., Facebook, LinkedIn). Nine participants were excluded as they failed the manipulation check (see pre-registered procedure). The final sample consisted of 95 Italian participants ( $M_{age} = 30.12$ ;  $SD_{age} = 12.6$ ). The sample included 64 women, 28 men, 2 non-binary people, and 1 participant who did not specify the gender. The study was approved by the Padua Ethics Committee of Psychological Research.

## Measures and Procedure

The procedure was identical to Study 4a. Specifically, Study 4b incorporated the same manipulation task, stimuli, and the same measures as used in Study 4a. Again, the reliability index of the conspiracy measure was good ( $\alpha = .84$ ). In this sample, conspiracy beliefs scores were on average 53.98 ( $SD = 24.26$ ), and conspiracy worldview scores were on average 73.24 ( $SD = 23.04$ ). Moreover, the following measures, which related analyses and discussion are available in the next chapter (Study 6), were collected.

### *Situational collective action intentions*

Participants responded to 10 items asking them to rate their agreement to engage in collective action aimed at improving the society of Kalo. Agreement with these statements was provided on a scale ranging from 0 (minimum agreement) to 100 (maximum agreement). The reliability of these items was not high ( $\alpha = .59$ ), therefore, I ran an explorative factor analysis, where parallel analysis was used as the extraction method, and Promax was used as the rotation method. The output of the analysis provided a three-factor solution which explained 47% of the variance. Two items (“To improve the society of Kalo, citizens should protest to be free to interrupt their education, in order to shorten their school period”, “To improve the society of Kalo, I would protest in order to reduce State intervention”) were eliminated because they did not contribute to a simple factor structure.

Factor 1 was related to support for Kalo’s welfare policies (such as increasing compulsory schooling years, the implementation of a wage cap, the implementation of a minimum wage, and support for state interventions in the economy) and it comprised 4 items that explained 32% of the factor variance with factor loadings from .432 to .692 ( $M = 64.10$ ,  $SD = 19.03$ ; e.g., “To improve the society of Kalo, citizens should protest for the implementation of a minimum wage.”). Factor 2 was related to support for charitable initiatives and it comprised 2 items that explained 81% of the factor variance with .902 of factor loading ( $M = 58.64$ ,  $SD = 28.33$ ; e.g., “To improve the society of Kalo, I would

organize a charity funding”). Finally, Factor 3 was related to tax compliance and it comprised 2 items that explained 48% of the factor variance with .689 of factor loading ( $M = 45.94$ ,  $SD = 22.16$ ; e.g., “To improve the society of Kalo, I would protest for stronger taxation in order to allow the Government to implement better social welfare policies”). Analyses and discussions related to this variable are available in the next chapter (Study 6).

### ***General collective action intentions***

Participants responded to nine statements adapted from van Zomeren, Spears, and Leach (2010) aimed at assessing general behavioral intentions to engage in collective actions to counter economic inequality ( $M = 75.65$ ,  $SD = 19.41$ ,  $\alpha = .85$ ), gender inequality ( $M = 80.86$ ,  $SD = 21.48$ ,  $\alpha = .93$ ), and illegal immigration ( $M = 46.35$ ,  $SD = 28.52$ ,  $\alpha = .94$ ) (e.g., “I would sign a petition in order to support measures against economic inequality”, “I would vote for a political party that fights gender inequality”, “I would like to participate in collective action in order to fight illegal immigration”). Analyses and discussions related to this variable are available in the next chapter (Study 6).

## **Results**

### **Manipulation check**

Participants in the high inequality condition perceived a higher wage gap between the managerial and working-class ( $M = 97.24$ ,  $SD = 7.13$ ),  $t(42.57) = 12.53$ ;  $p < .001$ ;  $d = 2.77$ , and among citizens ( $M = 91.78$ ,  $SD = 18.48$ ),  $t(67) = 12.08$ ,  $p < .001$ ;  $d = 2.57$ , compared with the low inequality condition ( $M = 39.5$ ,  $SD = 28.50$ ;  $M = 34.2$ ,  $SD = 25.70$ , respectively), confirming the success of the economic inequality manipulation.

### **Conspiracy beliefs**

Participants in the high inequality condition reported higher levels of conspiracy beliefs ( $M = 66.24$ ,  $SD = 18.19$ ), compared to those in the low inequality condition ( $M = 37.13$ ;  $SD = 21.40$ ),  $t(93) = 7.15$ ,  $p < .001$ ;  $d = 1.5$ .

### **Conspiracy worldview**

Responses on the conspiratorial worldview in the real world did not differ between conditions ( $M_{HI} = 77.00$ ,  $SD_{HI} = 18.15$ ;  $M_{LI} = 68.08$ ,  $SD_{LI} = 27.85$ ),  $t(62.51) = -1.77$ ,  $p = .08$ ;  $d = .38$ ), providing reassurance that randomization had been successful.

### ***Conspiratorial worldview as moderator***

To test the moderation effect of conspiratorial worldview, I computed a multiple linear regression. The result was in line with H2; the higher the conspiratorial worldview, the stronger the differences between high and low inequality in conspiracy beliefs (Figure 7). Moreover, based on the Bayes Factor, the model including conspiracy worldview as a moderator was to be preferred both compared with the model including only the experimental conditions as predictor (BF = 9.25), and with the model including experimental conditions and conspiracy worldview as independent predictors (BF = 13.68). Specifically, while the single slope for the high economic inequality condition was statistically significant ( $\beta = .46$ ,  $p = .002$ ), it was not significant for the low economic inequality condition ( $\beta = -.08$ ,  $p = .48$ ). Finally, economic inequality had a main effect on conspiracy beliefs for participants holding both low (-1SD,  $t(91) = 2.70$ ,  $p = .008$ ) and high (+1SD,  $t(91) = 7.13$ ,  $p < .001$ ) levels of

conspiracy worldview.

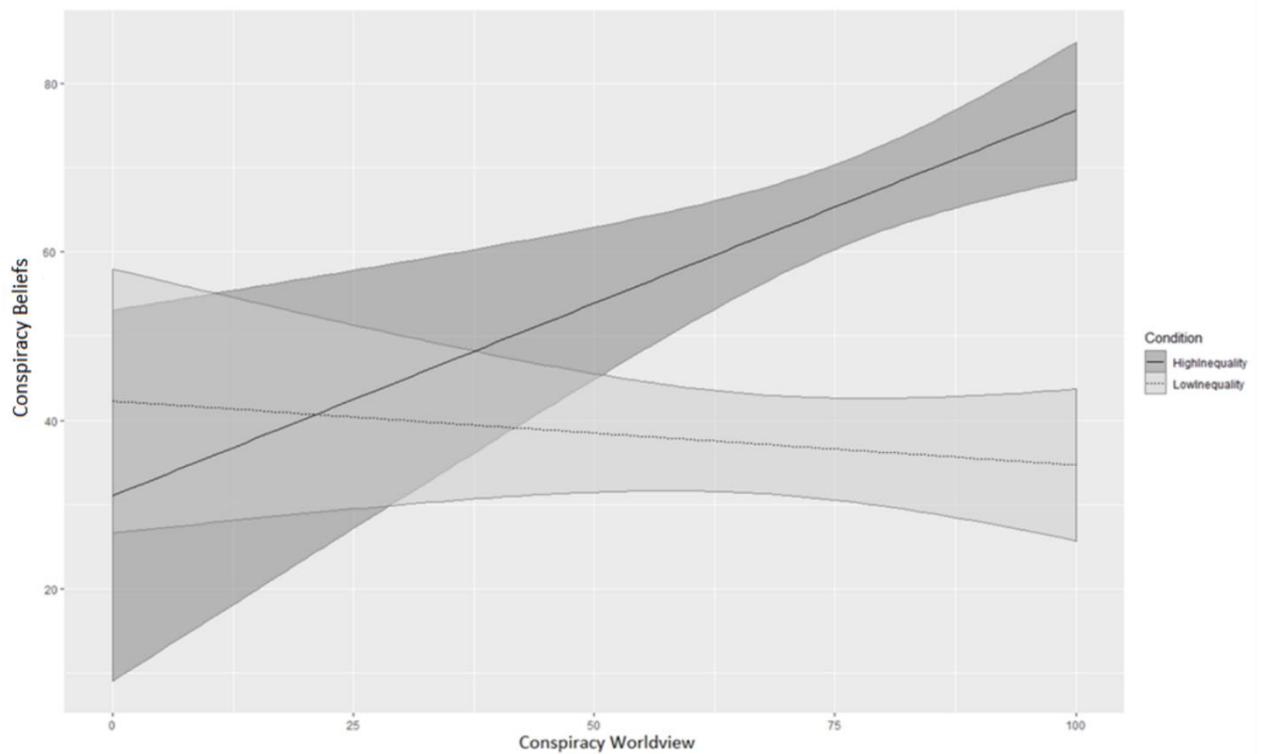


Figure 7. Interaction plot of conspiracy beliefs by conspiratorial worldview for high inequality and low inequality conditions.

### Aggregated analyses

As Study 4a and 4b used the same manipulation, the same measures of conspiracy beliefs and conspiracy worldview, I checked whether the increased power due to the aggregation of data substantially changes the interpretation of the results. The results of a post-hoc sensitivity power analysis with  $1-\beta = .80$ , and  $\alpha = .05$ , showed that the minimum effect detectable was  $d = .46$  for t-test,  $r = .16$  for correlations, and  $\eta^2 = .05$  for ANCOVA.

Overall, the aggregation of data did not change interpretation of the results for the single studies: conspiracy beliefs scores were higher in the high economic condition ( $t(149) = 9.87$ ,  $d = 1.61$ ,  $p < .001$ ), whereas conspiracy worldview was not affected by the manipulation ( $t(149) = 1.05$ ,  $d = .17$ ,  $p = .3$ ). Moreover, conspiracy worldview moderated the effect of the

experimental conditions on conspiracy beliefs. While the single slope for the high economic inequality condition was statistically significant ( $\beta = .36, p < .001$ ), it was not significant for the low economic inequality condition ( $\beta = -.10, p = .21$ ). Finally, economic inequality had a main effect on conspiracy beliefs for both participants holding low ( $-1$  SD,  $t(147) = 4.49, p < .001$ ) or high ( $+1$  SD,  $t(147) = 9.67, p < .001$ ) levels of conspiracy worldview.

### **Discussion**

Study 4b confirms the results of Studies 3a, 3b, and 4a, further corroborating that those participants who envisaged their life in a highly (low) unequal society were more likely to assume a higher spread of conspiracies in that society (H1). Overall, the results of Study 4b successfully replicated the results of Study 4a by showing that participants who held a more conspiratorial worldview were more sensitive to economic inequality manipulation (H2).

## **Study 5. A final study about economic inequality, social class, and conspiracy beliefs**

Study 5<sup>6</sup> was designed in order to achieve several goals. First of all, this study allowed to test one more time the impact of economic inequality on conspiracy beliefs with a well-powered sample. Moreover, I was able to test whether the impact of economic inequality on conspiracy beliefs may be influenced by the perceived socio-economic class. Indeed, it is plausible to believe that economic inequality may have a more pronounced effect for people that are low in the social hierarchies. Moreover, conspiracy theories by definition attribute conspiratorial actions to groups that are perceived as powerful, therefore it is possible that high-status group members would defend their group and reject conspiracy narratives. To reach the aims of this study, I used once again the Bimboola Paradigm, and I hypothesized that the high (vs. low) economic inequality condition will increase conspiracy beliefs (H1), and that the low class (vs. middle and high class) condition will increase conspiracy beliefs (H2).

### **Method**

#### **Participants**

A sample of 2637 recruited from the social media (e.g., Facebook, Instagram, LinkedIn) completed the questionnaire individually and voluntarily. One hundred and fifty-three did not provide the second informed consensus and they were therefore excluded from the experiment. Moreover, 365 participants were excluded because they failed the manipulation check. The final sample consisted in 2119 (1649 females, 457 males, 13 non-binary) participants (age  $M = 40$ ,  $SD = 12.73$ ). The results of a post-hoc sensitivity power analysis with  $N = 2119$  and  $1-\beta = .80$  showed that the minimum effect detectable was  $d = .12$  for t-tests and  $\rho = .06$  for correlations. The study was approved by the Padua Ethics Committee of Psychological Research.

#### **Procedure**

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<sup>6</sup> I want to thank Silvia Filippi and Ervin Dollani for their precious collaboration in this Study.

In this study, we used the Bimboola Paradigm (Jetten et al., 2015) to manipulate the perception of economic inequality and social class affiliation. Specifically, each participant was randomly assigned to one of six experimental conditions. As in Studies 3a and 3b, participants had to imagine that they were going to start a new life in the fictitious Bimboola society and make essential choices about housing, transportation, and holidays. Differently from previous studies, participants were assigned not only to a society characterized by high vs. low levels of economic inequality, but also to one of three income groups (low, middle, and high). Therefore, their choices were bounded by their income groups (e.g., participants assigned to the low class could choose only between the items for their income group).

## **Measures**

### ***Manipulation check***

We included a two-item manipulation check assessing the perceived economic inequality in Bimboola (“There are strong wealth differences in Bimboola”; “The wealth differences among Bimboola’s citizens are small”;  $r = -.91$ ). Moreover, we checked whether participants recognize the assigned income level (“At what wealth level you were assigned?”). Finally, we included two items assessing the perceived wealth of participants’ assigned group (“How wealthy is your group”; “How poor is your group”;  $r = -.96$ ).

### ***Conspiracy Beliefs***

Four items on a scale ranging from 1 (minimum agreement) to 7 (maximum agreement) assessed beliefs about conspiracies in Bimboola (i.e., “Politicians of Kalo aim to maintain their power and pursue their interests even when this deliberately harms the rest of the population”; “In Kalo society, the pharmaceutical industry aims to meet their economic and political goals, even when they are aware that their actions will harm citizens”; “Multinational companies secretly and deliberately exploit the workers and the resources of Kalo’s society in order to increase their profit”; “Scientists in Kalo fabricate or exaggerate several issues in order to maintain their social status, even when they are aware that their

actions have dramatic negative effect for the citizens”;  $\alpha = .89$ ; inter-item correlation = .67). In this sample, conspiracy beliefs scores were on average 4.16 ( $SD = 1.57$ ).

### ***Tax compliance***

Seven items, adapted from Kirchler & Wahl (2010), on a Likert scale ranging from 1 to 7 assessed tax compliance (i.e., “I feel a moral obligation to pay my tax”,  $\alpha = .89$ ; inter-item correlation = .67,  $M = 5.27$ ,  $SD = 1.45$ ). Analyses and discussions related to this variable are available in the next chapter (Study 7).

### ***Perception of tax as a contribution vs. a penalization***

One item, developed ad hoc for this study, ranging from 0 to 100, assessed the perception of tax as a contribution (0 = maximum contribution) or a penalization (100 = penalization; i.e., “Some people believe that taxes are a contribution that serves a greater good. Even if they are not happy to pay taxes, they see them as a contribution that they give to society to help its functioning. Differently, other people think that taxes are a penalization. Even if taxes could help society, they see the taxes paid as an imposed penalty. In which measure do you think that taxes are a contribution for Bimboola society or a penalty that the society is imposing?”,  $M = 33.61$ ,  $SD = 27.31$ ). Analyses and discussions related to this variable are available in the next chapter (Study 7).

### ***Support for progressive taxation***

Four items, developed ad hoc for this study, on a Likert-scale ranging from 1 to 7, assessed the support for progressive taxation (i.e., “Bimboola’s government should tax everybody with the same percentage”, “In Bimboola, taxes should be the same amount for everybody”, “In Bimboola, rich people should pay more taxes compared to the rest of the population”, “In Bimboola, the wealthy should be taxed more heavily”; the scores of the first two items were reversed,  $\alpha = .80$ ; inter-item correlation = .51,  $M = 5.78$ ,  $SD = 1.43$ ). Analyses and discussions related to this variable are available in the next chapter (Study 7).

***Political orientation, gender, age, education, socio-economic status, and personal annual income***

Finally, political orientation (on a scale ranging from 1 to 10), gender, age, education, personal and familiar subjective socio-economic status, and personal annual income were measured.

## **Results**

### **Manipulation check**

A t-test confirmed that participants in the high inequality condition perceived a higher wage gap ( $M = 9.15$ ,  $SD = 1.08$ ),  $t(1577.92) = 46.93$ ;  $p < .001$ ;  $d = 1.99$ , than those in the low inequality condition ( $M = 5.27$ ,  $SD = 2.53$ ). Moreover, an ANOVA showed a main effect of the assigned class on the perceived wealth of their socioeconomic class ( $F(2,2116) = 5537.48$ ,  $p < .001$ ,  $\eta^2 = .75$ ). Specifically, participants assigned to low socioeconomic class perceived their group as less wealthy ( $M = 2.64$ ,  $SD = 1.66$ ) compared to participants assigned to the middle class ( $M = 5.53$ ,  $SD = 0.96$ ,  $d = 2.13$ ,  $p < .001$ ), and to participants assigned to the high class ( $M = 8.28$ ,  $SD = 1.20$ ,  $d = 3.87$ ,  $p < .001$ ).

### **Conspiracy beliefs**

To test whether the experimental condition affected conspiracy beliefs, we ran a 2 (economic inequality level: high vs. low) X 3 (assigned socioeconomic class: low vs. middle vs. high) ANOVA. We found a main effect of economic inequality manipulation on conspiracy beliefs,  $F(1, 2113) = 144.89$ ;  $p < .001$ ,  $\eta^2 = .06$ , with participants in the high economic inequality condition reporting higher levels of conspiracy beliefs ( $M_{DIFF} = 0.80$ ,  $SE = 0.07$ ,  $p < .001$ ,  $d = .53$ ). Moreover, we found a main effect of the assigned socioeconomic class manipulation,  $F(1, 203) = 3.34$ ,  $p = .04$ ,  $\eta^2 = .003$ . However, the post-hoc comparison with Tukey correction revealed that no mean difference among classes was statistically significant (all  $M_{DIFF} < 0.19$ , all  $ps > .05$ ). No interaction effects were found which were changed by the interaction of the two factors,  $F(3, 203) = 0.55$ ;  $p = .577$ , see Figure 8).

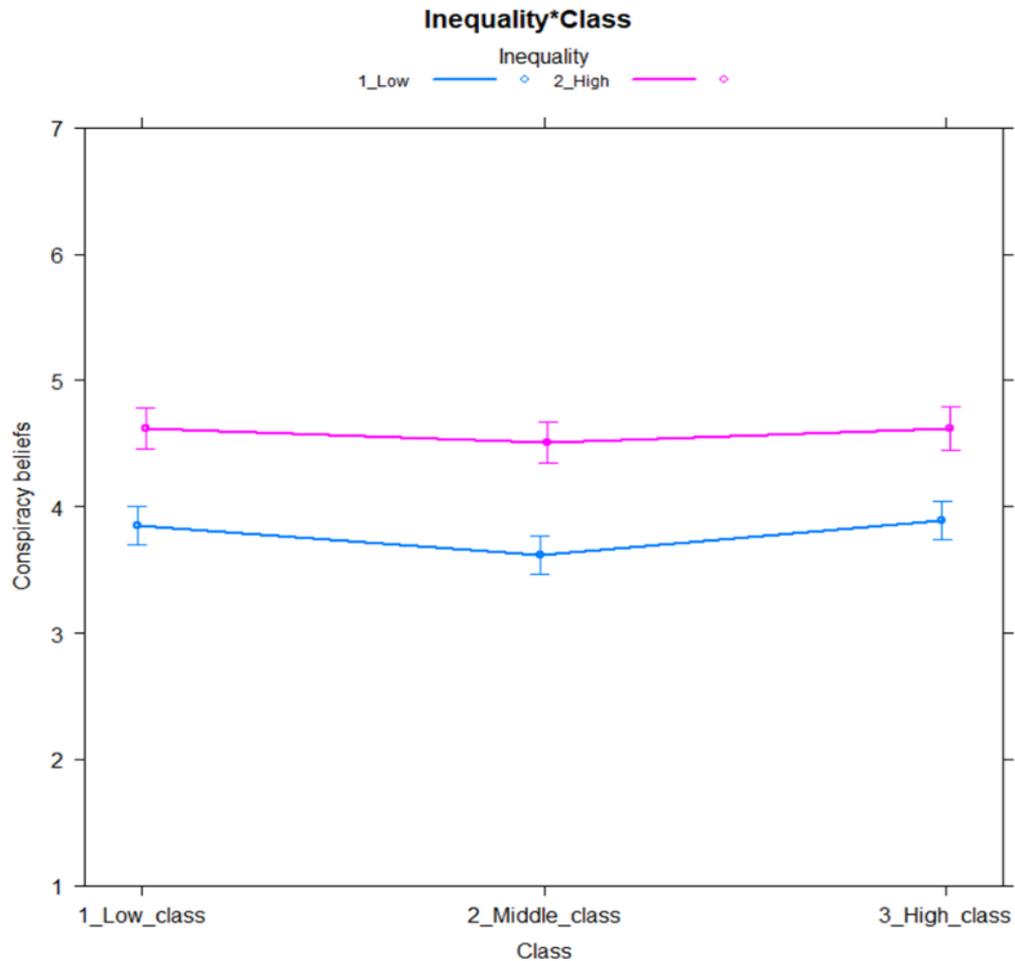


Figure 8. Inequality\*Class effects plot.

As the sample size was very large, it is possible that an effect may result significantly even with very small effect sizes. For this reason, I compared the models using the Bayes Factor. Based on the Bayes Factor, the model that included only economic inequality manipulation as a predictor was to prefer to the models that included both manipulations as independent effect ( $BF = 5.19$ ), and in interaction ( $BF = 295.47$ ). To further test the effect of social class on conspiracy beliefs, I ran a full-factorial ANCOVA with economic inequality level and subjective economic status as predictors. Again, we found a main effect of economic inequality manipulation on conspiracy beliefs,  $F(1, 2113) = 9.26$ ;  $p < .001$ ,  $\eta^2 = .004$ , with participants in the high economic inequality condition reporting higher levels of conspiracy beliefs ( $M_{DIFF} = 0.82$ ,  $SE = 0.07$ ,  $p < .001$ ,  $d = .54$ ). Moreover, we found a main effect of the

subjective economic status,  $F(1, 2113) = 45.43; p < .001, \eta^2 = .021$ , with the participant with higher subjective economic status having less conspiracy beliefs ( $\beta = -.14, p < .001$ , see Figure 9).

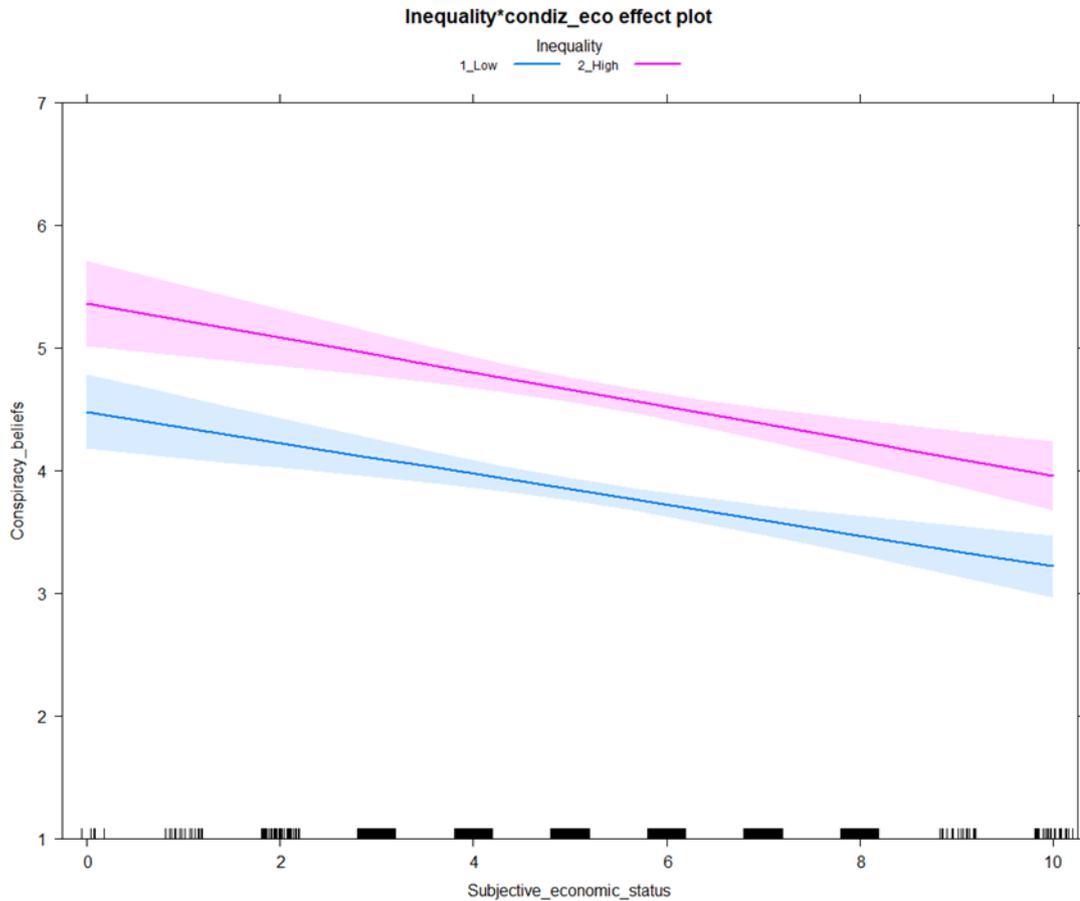


Figure 9. Inequality\*Class effect plot.

Finally, based on the Bayes Factor, the model that included economic inequality manipulation and subjective economic status as independent effects was to prefer to both the model including these predictors in interaction ( $BF = 46.89$ ), and the model including only the economic inequality manipulation or the subjective economic status (both  $BF > 1000$ ).

## Discussion

The correlational studies showed a reliable association between actual (Study 1a, 1b, and 1c) and perceived (Study 2) economic inequality and conspiracy beliefs. Moreover, the experimental studies showed a reliable and strong causal effect of manipulation of economic inequality on conspiracy beliefs. In fact, the perception of economic inequality was consistently associated with conspiracy beliefs across all studies. Previous literature showed that conspiracy beliefs arise in situations characterized by anomie, a feature that is part of a social reality perceived as economically unequal (e.g., Elgar, 2010; Fritsche & Jugert, 2017; Harding & Sibley, 2013; Sánchez-Rodríguez et al., 2019; Sprong et al., 2019). As expected, anomie mediated the effect of our manipulations on conspiracy beliefs. Furthermore, the data from Studies 4a and 4b supported a moderation effect, whereby participants with a stronger conspiracy worldview were more sensitive to a context characterized by high levels of economic inequality. The perception of economic inequality generates a sense of anomie and threat, but different mindsets make people react differently to such threatening stimuli. In particular, people believing that conspiracies are frequent are more likely to apply this worldview when prompted to do so. Finally, Study 5 showed that a higher self-perceived social class is associated with a weaker endorsement of conspiracy beliefs, supporting the idea that conspiracy beliefs are less attractive for people with more power.

These results have important implications. Those who are prone to believe in conspiracy theories are sometimes viewed as driven by irrationality, a vision that is indeed supported by a vast literature about the negative consequences of conspiracy beliefs (e.g., Jolley & Douglas, 2014a; Lewandowsky et al., 2013; Van der Linden, 2015), and findings that conspiracy beliefs are associated with dispositional factors that are prodromal of mental disease, such as schizotypy and delusional thinking (Barron et al., 2018; Darwin et al., 2011). However, the factors that trigger conspiracy beliefs seem to be not entirely random and irrational, rather they can be driven by anomie-prompting socio-structural perceptions about

societies such as economic inequality. As conspiracy beliefs are the results of perceptions about the social environment, and that humans are not just a passive receiver of environmental stimuli, important questions regard what kind of actions and behaviors are taken once people believe in conspiracy theories. In the next chapter I will outline a potential framework aimed at producing predictions about conspiracy beliefs consequences, and initial evidence in support of that.

### **Chapter 3. Consequences of conspiracy beliefs**

Conspiracy beliefs attracted the attention of scientists and international organizations not only because they are particularly diffuse in different contexts, but especially because of their potential social consequences. Indeed, conspiracy beliefs can impact people's decision-making processes. For example, people believing that pharmaceutical industries are conspiring against the population can coherently act avoiding products made by those industries. This decision can have outcomes limited to the individual (e.g., a disease may not be cured), or that may extend to the society (e.g., facilitating the spread of a disease). As soon as the consequentiality of conspiracy beliefs was recognized as one of their main features, many studies were conducted to understand which are these consequences. As already mentioned in Chapter 1, evidence suggests that that conspiracy beliefs cause a large set of attitudinal and behavioral responses, which have an impact on individual and public health, political discourses, and society development (Douglas et al., 2019). However, it is not clear to which degree these responses are consequences of conspiracy beliefs or are rather embedded in the content of such conspiracy beliefs. Indeed, Imhoff and Lamberty (2020) found that believing in different conspiracy theories about COVID-19 leads to different health-related behaviors, suggesting that content is a relevant element to shape conspiracy beliefs-based behavioral responses. Overall, it is not yet clear which general psychological processes are prompted by conspiracy beliefs. Here I propose that an important psychological process prompted by conspiracy beliefs is tribalism, defined as “tendencies to be loyal to and favorable towards one's own tribe (and less favorable toward other tribes)”, and with tribe being “a human social group sharing a common interest”. (Clark et al., 2019; p. 591). From an evolutionary perspective, conspiracy beliefs and tribalism can stem from similar contextual causes. Indeed, both tribalism and conspiracy beliefs can be viewed as a result of coalitional conflicts common in ancient societies. Coalitions that reproduced more prolifically, and thus were more likely to pass their genes and traits, were not only more collaborative and cohesive but also abler to

take appropriate resources from other coalitions. In that context, the higher tendency in believing conspiracy theories would have been strictly related to the tendency to detect hostile coalitions and correctly act in defense of the ingroup. Another interesting analogy between tribalism and conspiracy beliefs is that both increase in a context characterized by anomie and uncertainty. Indeed, while humans are motivated to pursue accurate and unbiased information, when values and facts are ambiguous, and the truth is not easily achievable, the influential role of the ingroup becomes more relevant, as it is more important to signal coherence and loyalty to the ingroup's values (Kurzban & Christner, 2011). Finally, also the behavioral consequences of tribalism appear like that of conspiracy beliefs. In fact, both tribalism and conspiracy beliefs can lead to reduced judgmental accuracy about the ingroup and the outgroup (Kahan et al., 2017), selective exposure to information (Frimer et al., 2017), uncritical acceptance or rejection of information based on group membership (Ditto et al., 2019), and discrimination (Wetherell et al., 2013).

In sum, conspiracy beliefs and tribalism share similar evolutionary origins, similar triggering environmental cues, and similar behavioral responses. However, how do they relate to each other? Conspiracy beliefs may on the one side gather people with similar needs (i.e., need of control, affiliation, certainty) and similar interests, proving a common epistemic ground; on the other hand, they also identify a common enemy which is explicitly blamed as responsible for the ingroup concerns. In other words, conspiracy beliefs represent a call to affiliate and to organize against an outgroup. Indeed, as already mentioned, conspiracy-related online communities flourish when dramatic events happen (Samory & Mitra, 2018), and based on Chapter 4 findings (Study 12), people who believe in conspiracy theories have a higher tendency to engage with social media content. When a group of people believing in conspiracies is formed, then tribal bias leads to congruent behavioral responses, namely, the information provided by outgroup members is ignored and ingroup arguments and beliefs are uncritically defended. Moreover, tribalism may also influence conspiracy beliefs, as the spread

and defense of conspiracy theories can increase the number of people believing in conspiracy by mere exposition processes.

Based on this theorizing, we can expect that conspiracy beliefs may not have only negative consequences, but the valence of the consequences is determined by the specific targets of conspiracy theories. Moreover, we can expect that support for policies and public decisions is influenced by their relationship with the outgroup. For example, it is possible that people believing in conspiracies about the economic élites perceive taxes as a burden, but they may still support progressive taxation because it specifically targets economic élites.

As conspiracy beliefs express control concerns and signal the intention to coordinate with the ingroup against the outgroup, I expect that conspiracy beliefs prompt a) collective actions targeting the issues raised by the outgroup, b) support policies against the status quo, and c) opposition to policies proposed by the outgroup. In the following studies, I tested the impact of conspiracy beliefs and conspiracy ideation on these three outcomes.

In Study 6, I tested whether conspiracy beliefs mediate the impact of perceived economic inequality on a number of different collective action intentions. Then, in Study 7, I tested the different impact of conspiracy beliefs on tax compliance and support for progressive taxation. Finally, in Study 8a and 8b, I tested the association of conspiracy beliefs with reduced vaccine intention and the mediation role of trust in science.

## **Study 6. Conspiracy beliefs and collective actions**

The aim of Study 6 was to explore the link between conspiracy beliefs and collective action against economic inequality. This goal was achieved within the data collection conducted for experiment 8a, of which I here report the portion of results that pertains to the dependent variables of collective actions. As already mentioned, I expect that conspiracy beliefs are used to express the intention to coordinate with the ingroup to challenge the outgroup. As economic inequality prompts the perception of anomie, which in turn leads to conspiracy beliefs, in the present study, I explored whether a conspiratorial appraisal of economic inequality may encourage to collectively act for redistribution.

Moreover, I tested if conspiracy worldview would be associated with general collective action intentions against economic inequality.

Thus, I hypothesized that in high (vs. low) economic inequality condition participants will express more support for collective action aimed at reducing inequalities (H1). Moreover, I expect that conspiracy beliefs about Kalo mediate the effect of the economic inequality manipulation on support for collective actions aimed at improving Kalo's society (H2). Finally, I hypothesized that conspiracy worldview is positively associated with intentions to join collective actions against wealth inequalities.

### **Method**

This study is a secondary analysis of Study 4b reported in Chapter 2, therefore I refer to the previous description of participants and method.

### **Results**

#### **Situational collective action intentions**

To test the effect of the manipulation on the support for collective actions aimed at improving the society of Kalo, I computed a sequence of t-tests, with Benjamini-Hochberg's correction procedure (Benjamini & Hochberg, 1995), a statistical correction that grants more statistical power than Bonferroni's correction (Thissen et al., 2002), for multiple comparisons.

High (vs. low) inequality condition enhanced collective actions' support. Perceiving economic inequality had an effect only on support for collective actions, for welfare policies, but not for charity initiatives, nor tax compliance (see Table 3 for descriptive and t-test statistics).

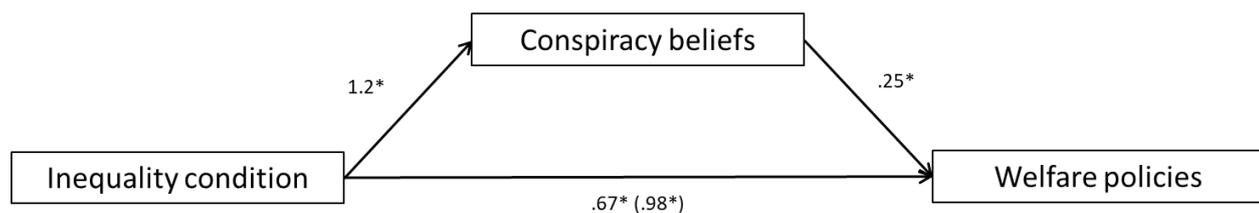
Table 3

Descriptives and t-test for collective action intentions type.

	Condition	Mean	SD	<i>t</i>	<i>P value</i>
Welfare policies	High inequality	71.96	15.44	5.374	<.001
	Low inequality	53.30	18.32		
Charity	High inequality	61.62	29.12	1.206	.31
	Low inequality	54.53	27.04		
Tax compliance	High inequality	43.96	22.65	-1.023	.31
	Low inequality	48.66	21.44		

### Mediation analysis

Mediation models showed that conspiracy beliefs partially mediated the effect of experimental conditions on collective actions aimed to support welfare policies (indirect effect:  $b = .31$ ,  $SE = .14$ ,  $CI = [.04, .63]$ ,  $p = .03$ ; total effect:  $b = .98$ ,  $SE = .18$ ,  $CI = [.61, 1.35]$ ,  $p < .001$ ; direct effect:  $b = .68$ ,  $SE = .22$ ,  $CI = [.24, 1.09]$ ,  $p = .002$ ; see Figure 10), but no indirect effects were found for collective action aimed to support charity initiatives and taxes (all  $ps > .05$ ). Overall, H1 was partially supported.



*Figure 10.* Path model for collective actions supporting Kalo's welfare policies with standardized coefficients.

### **General collective action intentions**

The effect of conspiracy beliefs on behavioral intentions toward economic inequality was not limited to the Kalo scenario. Indeed, in line with H2, there is a positive association between conspiracy worldview and general collective action intentions aimed at reducing economic inequality ( $r = .34, p < .001$ ), but conspiracy worldview was not associated with intentions aimed at reducing gender inequalities ( $r = .14, p = .17$ ), or illegal immigration ( $r = .11, p = .30$ ).

### **Discussion**

The support for collective actions was different between conditions only in the case of welfare policies. This difference was mediated by conspiracy beliefs. Arguably, economic inequality prompts collective actions aimed at changing the social system, whereas actions related to tax policies and charity initiatives may be not perceived as directly tackling economic differences (for example, taxes may not be used for redistributing resources). Similarly, conspiracy beliefs were associated only with collective actions that challenge the social system and that can damage the power of the outgroup (e.g., by fixing a limit on their wages), or benefit the ingroup (e.g., by fixing a minimum amount of wage).

Importantly, the experimental results were corroborated by the relationship found between conspiracy worldview and general collective actions aimed at reducing economic inequality (H2). Indeed, a conspiratorial worldview was positively associated with behavioral intentions aimed at reducing economic inequalities, providing evidence for the positive outcomes of conspiracy endorsement in terms of challenging the system. This effect appears to be specific to economic inequality, as conspiracy worldview was not associated with a

propensity toward collective actions for issues related to gender inequality or illegal immigration.

Evidence from this Study suggests that conspiracy beliefs are associated with intention to engage in collective actions against the outgroup. While this is in line with the aforementioned conceptualization of tribalism, it is still possible this intention is not driven by a tribal bias: in particular, it is unclear whether the support for the collective actions is based on the perceived general efficacy of the actions proposed rather than the perception that they could advantage the ingroup members and damage the outgroup members. For this reason, the next study will focus on how attitudes toward the same policy (taxation) will be differently associated to conspiracy beliefs according to the target of the policy.

## **Study 7. Conspiracy beliefs and tax compliance**

Study 7 further explores the relationship between conspiracy beliefs and actions aimed to reduce economic inequality, focusing on tax compliance and support for progressive taxation. In fact, in the previous study, I showed that conspiracy beliefs were associated with collective actions intention aimed at reducing economic inequality, but they were not associated with collective actions intention related to taxation. Generally, conspiracy beliefs are associated with distrust towards institutions (Hawley, 2019). As taxes are managed by the untrusted government, it is plausible that people with stronger conspiracy beliefs will perceive taxes as a useless penalization, and therefore be less compliant about taxation. Differently, people with stronger conspiracy beliefs may support progressive taxation as this taxation system is more burdensome for the economic élites. In other words, people believing in conspiracy theories will have different attitudes towards taxation based on the assumed target of taxes (non-specified vs. the wealthier).

To reach the aim of this study, I used once again the Bimboola Paradigm, and I hypothesized that:

1. The high (vs. low) economic inequality condition will reduce tax compliance (H1a), and this effect will be mediated by conspiracy beliefs (H1b).
2. The high (vs. low) economic inequality condition will increase support for progressive taxation (H2a), and this effect will be mediated by conspiracy beliefs (H2b).

### **Method**

This study is a secondary analysis of Study 5 reported in Chapter 2, therefore I refer to previous description of participants and method.

## Results

### Tax compliance

To test the impact of economic inequality on tax compliance and the mediating role of conspiracy beliefs, I ran a mediation model using the software JASP (Love et al., 2019) with bootstrapping for 5,000 resamples and 95% confidence intervals (Preacher & Hayes, 2008). The mediation model confirmed that subjective inequality had an indirect effect via conspiracy beliefs on tax compliance: indirect effect:  $b = -0.12$  ( $SE = 0.02$ , 95%  $CI = [-0.15, -0.10]$ ). The direct effect was fully mediated: direct effect:  $b = -0.03$  ( $SE = 0.04$ , 95%  $CI = [-0.11, 0.06]$ ), total effect;  $b = -0.15$  ( $SE = 0.04$ , 95%  $CI = [-0.24, -0.07]$ ) (see Figure 11).

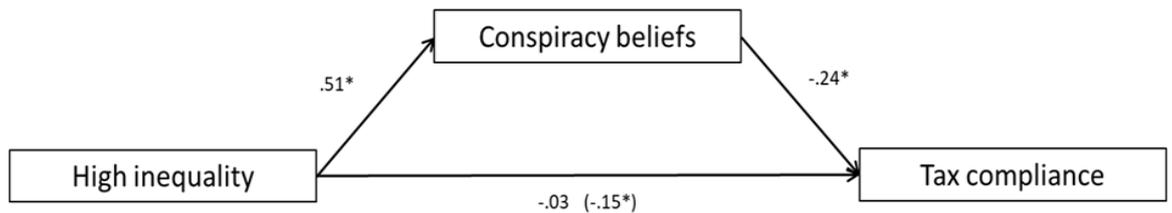
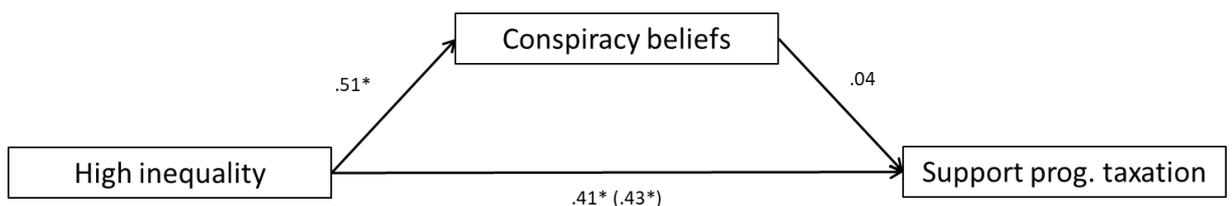


Figure 11. Path model for tax compliance with standardized coefficients.

### Support for progressive taxation

I ran another mediation model to test the impact of economic inequality on support for progressive taxation and the mediating role of conspiracy beliefs. The mediation model did not confirm that subjective inequality had an indirect effect via conspiracy beliefs on support for progressive taxation: indirect effect:  $b = 0.02$  ( $SE = 0.01$ ), 95%  $CI = [0, 0.05]$ . The direct effect was significant: direct effect:  $b = 0.41$  ( $SE = 0.04$ ), 95%  $CI = [0.33, 0.50]$ , total effect;  $b = 0.433$  ( $SE = 0.04$ ), 95%  $CI = [0.35, 0.52]$  (see figure 12).



*Figure 12.* Path model for collective actions supporting Kalo's welfare policies with standardized coefficients.

Even if conspiracy beliefs did not mediate the effect of economic inequality manipulation on the support for progressive taxation, correlation analysis revealed that there is a positive association between the two variables,  $r = .09$ ,  $p < .001$ .

### **Perception of taxes as contribution vs penalization**

As conspiracy beliefs were negatively associated with tax compliance but positively with support for progressive taxation, I ran a final mediation model to further explore the association between these variables and the mediating role of the perception of taxes as a penalization vs. contribution. The mediation model confirmed that conspiracy beliefs had an indirect effect via perception of taxes as a penalization (vs. contribution) on tax compliance: indirect effect:  $b = -0.13$  ( $SE = 0.009$ , 95% CI = [-0.15, -0.11]). The direct effect was partially mediated: direct effect:  $b = -0.03$  ( $SE = 0.01$ ), 95% CI = [-0.05, -0.004], total effect;  $b = -0.16$  ( $SE = 0.01$ ), 95% CI = [-0.18, -0.13]. Moreover, conspiracy beliefs had an indirect effect via perception of taxes as a penalization (vs. contribution) on support for progressive taxation: indirect effect:  $b = -0.02$  ( $SE = 0.02$ , 95% CI = [-0.03, -0.01]). The direct effect was partially mediated: direct effect:  $b = 0.08$  ( $SE = 0.01$ ), 95% CI = [0.05, 0.11], total effect;  $b = 0.06$  ( $SE = 0.01$ ), 95% CI = [0.03, 0.09] (see Figure 13).

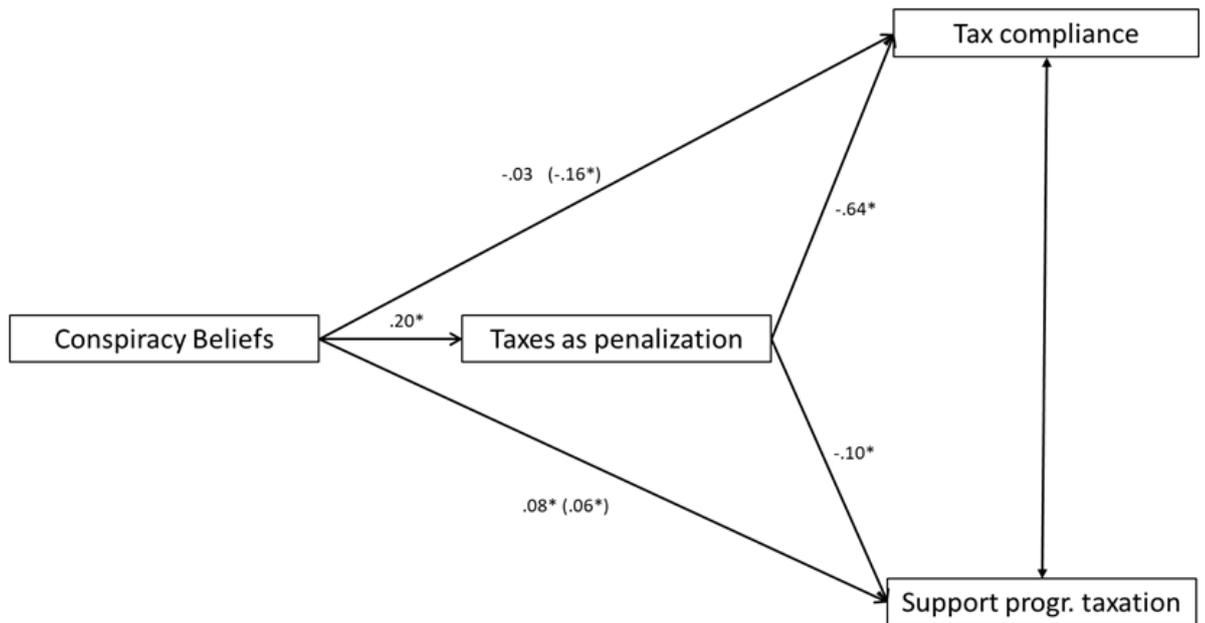


Figure 13. Path model for tax compliance and support for progressive taxation with standardized coefficients.

### Discussion

In this study, I provided evidence for a relationship between conspiracy beliefs and attitudes towards taxation. While conspiracy beliefs are negatively associated with tax compliance, they are positively associated with support for progressive taxation. While the tax compliance measure used in this study refers to a generally positive attitude toward taxes, the support for progressive taxation is explicitly related to the fact that the wealthier groups have to pay more taxes. Interestingly, even if people believing in conspiracy theories tend to believe that taxes are more a penalization than a contribution for society, and they coherently report lower levels of tax compliance, they also tend to be more supportive of progressive taxation. These results can be interpreted as the application of tribal biases. While tribal bias was not directly measured in this study, the results can be interpreted through this theoretical device. In an unequal context triggering conspiracy beliefs, the value of paying taxes to contribute to society is undermined, possibly due to the conspiratorial assumption that the collected money will probably be used for negative and immoral aims. Differently, a progressive tax system is

possibly conceived as targeting elites, implying that the wealthiest groups should be responsible for financing a greater share of public expenditures, and this may explain why people with a conspiratorial worldview tend to support this strategy. In fact, conspiracy theories are generally blaming elites as the cause of social problems (Castanho Silva et al., 2017).

In other words, the support for progressive taxation is not based on an analysis of the advantages of the policy, but it is rather based on the intention to penalize outgroup members. While the results of this study are coherent with the theorized tribal bias, it is important to test whether conspiracy beliefs are associated with behavioral outcomes through their impact on attitudes to outgroup members. Moreover, it is still possible that people believing in conspiracy theories act in favor of the ingroup and in derogation of the outgroup in light of a plausible assessment of the situation. In order to provide evidence able to overcome these issues, I ran two final studies.

## **Study 8a. Conspiracy beliefs and vaccine hesitancy**

The aim of this study<sup>7</sup> was to test the impact of conspiracy beliefs on COVID-19 vaccine compliance, and how this is mediated by distrust in scientists even when risk perception is considered. Trust in scientists is a core element for promoting vaccine compliance (Gross, 2009). Usually, specialist knowledge and skills are required to understand how a vaccine has been developed, to assess its safety and efficacy, and to design appropriate vaccine policies and recommendations. This complexity creates an implicit imbalance of power between experts (e.g., healthcare professionals, scientists) and non-experts (patients) due to the high level of information asymmetry. Effective decision making about vaccination requires trusting several actors who are informed and acknowledged about the available evidence. Scientists are particularly relevant in the context of vaccination, as they are in the first line for the development of vaccines, and assessment of vaccine safety both pre-and post-approval (Kesselheim et al., 2021), and for this reason, trusting their work can lead to a stronger intention to accept the vaccine from the hands of other experts, that is healthcare professionals. In other words, trusting vaccine experts means that individuals accept their own vulnerable position and assume that someone else has the competence and the intention to take care of complex decisions, such as the implementation of vaccine policies, the definition of vaccine dosage, and so forth. Conspiracy theories about healthcare professionals and pharmaceutical industries can disrupt the trust in scientific and medical guidelines, as they deny information asymmetries between experts and non-experts and attribute malevolent intentions to the group of experts. As a result, medical information is not retrieved to have an accurate picture of the situation, or just by risk perception, but it is influenced by tribal bias. Indeed, people holding conspiracy beliefs tend to follow their attitudinal preferences when they search, select, consume, and evaluate information about vaccines (Salvador Casara et al.,

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<sup>7</sup> I want to thank Prof. Martinez-Conde, Prof. Dolinski, Prof. Kulesza, Prof. Genchow, and Pawel Muniak for their precious help in the data collection of this Study.

2020). Thus, conspiracy beliefs can negatively impact vaccine intentions as they disrupt the trust toward members of the scientific community, picturing them as antagonists with malevolent intentions. Moreover, previous studies already highlighted that conspiracy beliefs are associated with a lower intention to perform contact-related preventive behaviors (e.g., avoid handshakes, social distancing), and that this association is mediated by trust (Bruder & Kunert 2021). Moving a step forward, this study tries to conceptually replicate these previous findings, focusing on a specific behavioral intention (vaccine intention) and on a specific group (scientists). Moreover, in this study the mediation model is tested considering the role of risk perception.

For these reasons, I hypothesized that Conspiracy beliefs will be negatively associated with COVID-19 vaccine compliance (H1), and that trust in scientists will mediate the association between conspiracy beliefs and COVID-19 vaccine compliance even when the perceived likelihood of infection is taken into account (H2).

## Method

### Participants

One thousand participants within the United States (515 women, 485 men,  $M_{\text{age}} = 45.33$ ,  $SD_{\text{age}} = 15.95$ ), ranging from ages 18 to 82, were recruited for an online study via Prolific.co. Six participants (4 women, 2 men,  $M_{\text{age}} = 26.17$ ,  $SD_{\text{age}} = 7.78$ ) were excluded from the analyses at preregistration, due to lack of answers to the first question and/or a survey completion time under 10 seconds (which we treated as a proxy of lack of attention and/or bot activity). Thus, the final sample consisted of 994 participants (511 women, 483 men,  $M_{\text{age}} = 45.45$ ,  $SD_{\text{age}} = 15.92$ ), ranging from 18 to 82. All study participants answered the same set of questions. The results of a post-hoc sensitivity power analysis with  $N = 994$  and  $1 - \beta = .80$  showed that the minimum effect detectable was  $\rho = .08$  for correlations.

This study was reviewed by the Research Ethics Committee of the SWPS University of Humanities and Social Sciences, Wroclaw Faculty. The Commission gave a positive opinion on this project.

## **Measures**

For all measures, we asked participants to rate their agreement (1 = definitively no; 9 = definitely yes) with these specific statements.

***Vaccine intention.*** “Are you going to take a shot once the COVID-19 vaccine is available on the market?”,  $M = 6.85$ ,  $SD = 2.67$ .

***Trust in scientists.*** “In the coronavirus (COVID-19) case, can we rely on the results of research conducted by scientists?”,  $M = 7.23$ ,  $SD = 1.89$ .

***Conspiracy beliefs.*** “I believe that some secret powers (e.g., countries, big corporations) are responsible for coronavirus/COVID-19?”,  $M = 3.32$ ,  $SD = 2.68$ .

***Perceived likelihood of infection.*** As previous research found that health-protective behaviors are positively associated with risk perception, I took into account the role of the perceived likelihood of infection in the data analysis as a potential confounding variable. Thus, I used two items, the first referring to the personal risk of being infected (“How likely is it that you will become infected with coronavirus (COVID-19)?”), and the second referring to the perceived risk that others will be infected (How likely is it that your fellow countrymen will become infected with coronavirus (COVID-19)?). In order to obtain a measure of general perceived likelihood of infection, I computed the mean between these two items ( $M = 4.83$ ,  $SD = 1.66$ ).

Each question was displayed separately via Qualtrics. Respondents indicated their gender and age after answering the last survey question.

## Results

To test the impact of conspiracy beliefs on vaccine compliance and the mediating role of trust in science, I ran a mediation model using the software JASP (Love et al., 2019) with bootstrapping for 5,000 resamples and 95% confidence intervals (Preacher & Hayes, 2008) and taking into account the perceived likelihood of infection as background confounder. The mediation model confirmed that conspiracy beliefs had an indirect effect via trust in science on vaccine compliance: indirect effect:  $b = -0.26$  ( $SE = 0.02$ , 95%  $CI = [-0.32, -0.22]$ ). The total effect was partially mediated: direct effect:  $b = -0.09$  ( $SE = 0.03$ ), 95%  $CI = [-0.16, -0.04]$ , total effect;  $b = -0.36$  ( $SE = 0.03$ ), 95%  $CI = [-0.43, -0.30]$  (see Figure 14).

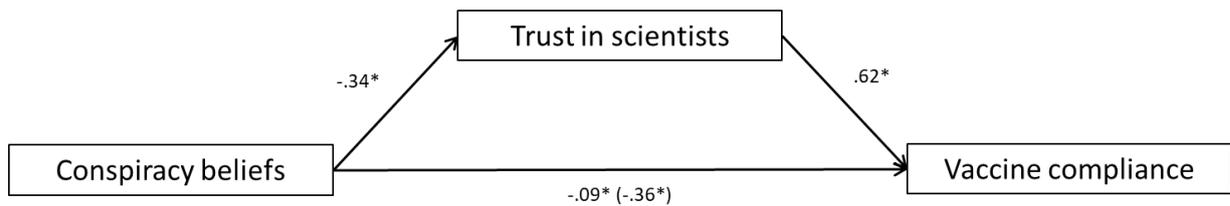


Figure 14. Path model for vaccine compliance with standardized coefficients.

## Discussion

Study 8a supported the hypotheses. Even when the perceived likelihood of infection was taken into account, the endorsement of conspiracy beliefs was negatively associated with COVID-19 vaccine compliance. This association was fully mediated by trust in scientists. This suggests that the behavioral consequences of conspiracy beliefs may be based on intergroup dynamics. It is possible that conspiracy theories, picturing members of specific groups as characterized by malevolent intentions, can prompt distrust towards the group. In the case of COVID-19 vaccines, scientists represent the group responsible for the fabrication of vaccines and the development of guidelines aimed at containing the virus, therefore the decision to get the vaccine overcomes the analysis of risks, but it could also be grounded on intergroup dynamics.

### **Study 8b. Conspiracy beliefs and vaccine hesitancy: a replication**

One of the main limits of Study 8a is that the sample, even if high-powered, was limited to participants recruited from the U.S.A. and therefore they are hardly generalizable. Thus, the goal of Study 8b was to replicate the results from Study 8a overcoming these limits with a more diverse sample of several countries with different pasts on COVID-19. Specifically, data were collected from participants coming from Italy (the first country in Europe and hit hard by the first wave), Germany (also hit hard but dealt much better than Italy), Poland (at that time casualties were very low, and it was hard to meet anybody in close relation with somebody who was lost due to the COVID-19), and USA (also hit hard but facing a second wave).

Another relevant limit of Study 8a was that it considered the perceived likelihood of COVID-19 infection, however in health-related decision-making literature, also the perceived danger (severity) of disease represents another relevant driver for promoting protective behavior. Moreover, it could be related to both conspiracy beliefs and trust in science, as they both respond to an existential threat (Swami et al., 2016, Farias et al., 2013). For this reason, when I tested the relationship among conspiracy beliefs, trust in science, and vaccine intention, I also considered the potential confounding role of this risk perception facet. For similar reasons, as this Study was conducted while COVID-19 was already a pervasive reality for a lot of people, I included in the analysis, as a potential confounder, the perception of immunity to COVID-19.

As in the previous study, I hypothesized that conspiracy beliefs will be negatively associated with COVID-19 vaccine compliance (H1), and that trust in scientists will mediate the association between conspiracy beliefs and COVID-19 vaccine compliance.

## Method

### Participants

Participants were recruited via social media postings (international sample), MTURK (USA sample), and invitations sent by the universities to their students (Poland, Italy, Germany). Overall, we recruited 1016 participants. 114 were excluded from the analysis due to lack of answers (which we treated as a proxy of lack of attention) or a declaration of a positive COVID-19 test result. The final sample consisted of 902. The reason for collecting data across nations was to enhance generalizability, and to ensure that conclusions were not limited to one particular socio-political circumstance. No Country comparison was statistically tested, as the number of nations is too small to draw meaningful cross-national comparisons, and any such comparisons would be difficult or even problematic to interpret. Data were collected from 05/07/2020 to 22/07/2020. The results of a post-hoc sensitivity power analysis with  $N = 1016$  and  $1-\beta = .80$  showed that the minimum effect detectable was  $\rho = .08$  for correlations. This study was reviewed by the Research Ethics Committee of the SWPS University of Humanities and Social Sciences, Wroclaw Faculty. The Commission gave a positive opinion on this project.

### Sub-samples participants

#### *Poland sample*

472 participants (374 women, 96 men, 2 non-binary persons:  $M_{\text{age}} = 34.69$ ,  $SD_{\text{age}} = 11.42$ ), ranging from ages 18 to 72, agreed to take part in the survey. 32 participants (22 women, 11 men:  $M_{\text{age}} = 28.63$ ,  $SD_{\text{age}} = 6.05$ ), ranging from ages 18 to 38, were excluded from the analyses due to lack of answers (which we treated as a proxy of lack of attention) or a declaration of a positive COVID-19 test result. The final sample consisted of 440 participants

(353 women, 85 men, and 2 non-binary persons:  $M_{\text{age}} = 35.13$ ,  $SD_{\text{age}} = 11.6$ ), ranging from 18 to 72.

### ***Italy sample***

106 participants (64 women, 41 men, 1 non-binary person:  $M_{\text{age}} = 29.17$ ,  $SD_{\text{age}} = 8.91$ ), ranging from ages 20 to 68, agreed to take part in the survey. 6 participants (3 women, 3 men:  $M_{\text{age}} = 27.67$ ,  $SD_{\text{age}} = 3.88$ ), ranging from ages 24 to 35, were excluded from the analyses due to lack of answers (which we treated as a proxy of lack of attention) or a declaration of a positive COVID-19 test result. The final sample consisted of 100 participants (61 women, 38 men, and 1 non-binary person:  $M_{\text{age}} = 35.13$ ,  $SD_{\text{age}} = 11.6$ ), ranging from 20 to 68.

### ***Germany sample***

137 participants (84 women, 44 men, 1 non-binary person, 8 people did not provide gender information and:  $M_{\text{age}} = 26.02$ ,  $SD_{\text{age}} = 6.92$ ), ranging from ages 18 to 63, agreed to take part in the survey. 8 participants ( $N/A$  women,  $N/A$  men:  $M_{\text{age}} = N/A$ ,  $SD_{\text{age}} = N/A$ ), were excluded from the analyses due to lack of answers (which we treated as a proxy of lack of attention) or a declaration of a positive COVID-19 test result. The final sample consisted of 129 participants (84 women, 44 men, and 1 non-binary person:  $M_{\text{age}} = 26.02$ ,  $SD_{\text{age}} = 6.95$ ), ranging from 20 to 68.

### ***International social media sample***

94 participants (57 women, 37 men:  $M_{\text{age}} = 51.46$ ,  $SD_{\text{age}} = 12.84$ ), ranging from ages 21 to 76, agreed to take part in the survey. 42 participants (15 women, 27 men:  $M_{\text{age}} = 53.74$ ,  $SD_{\text{age}} = 12.93$ ), ranging from ages 30 to 76, were excluded from the analyses due to lack of answers (which we treated as a proxy of lack of attention) or a declaration of a positive COVID-19 test result. The final sample consisted of 52 participants (30 women, 22 men:  $M_{\text{age}}$

= 49.62,  $SD_{\text{age}} = 12.56$ ), ranging from 21 to 76, from 10 countries: USA ( $N = 33$ ), Spain ( $N = 7$ ), France ( $N = 3$ ), Switzerland ( $N = 2$ ), United Kingdom ( $N = 2$ ), Canada ( $N = 1$ ), Germany ( $N = 1$ ), India ( $N = 1$ ), Italy ( $N = 1$ ), New Zealand ( $N = 1$ ). The 33 participants from the USA (23 women, 19 men:  $M_{\text{age}} = 50.79$ ,  $SD_{\text{age}} = 12.49$ ), ranged from ages 24 to 76.

### ***USA sample # 2 - run via MTurk***

207 participants (79 women, 119 men, 2 non-binary people, 7 people did not provide gender information and:  $M_{\text{age}} = 35.08$ ,  $SD_{\text{age}} = 9.81$ ), ranging from ages 18 to 68, agreed to take part in the survey. 26 participants (11 women, 8 men:  $M_{\text{age}} = 34.95$ ,  $SD_{\text{age}} = 9.36$ ), ranging from ages 18 to 62, were excluded from the analyses due to lack of answers (which we treated as a proxy of lack of attention) or a declaration of a positive COVID-19 test result. The final sample consisted of 181 participants (68 women, 111 men, and 2 non-binary persons:  $M_{\text{age}} = 35.09$ ,  $SD_{\text{age}} = 9.88$ ), ranging from 18 to 68.

### **Measures**

Participants rated their agreement from *absolutely impossible* (1) to *quite certain* (11) in an online study via Qualtrics.

***Vaccine intention.*** “Are you going to take a shot once the COVID-19 vaccine is available on the market?”,  $M = 7.02$ ,  $SD = 3.29$ .

***Trust in science.*** “In the coronavirus (COVID-19) case, can we rely on the results of research conducted by scientists?”,  $M = 7.76$ ,  $SD = 2.49$ .

***Conspiracy beliefs.*** “I believe that some secret powers (e.g., countries, big corporations) are responsible for coronavirus/COVID-19?”,  $M = 4.41$ ,  $SD = 3.28$ .

***Perceived severity of infection.*** “How safe or dangerous is SARS-CoV-2/COVID-19 in your opinion?”,  $M = 7.01$ ,  $SD = 2.37$ .

**Perceived likelihood of infection.** We used three items, the first referring to the personal risk of being infected (“How likely is it that you will become infected with coronavirus (COVID-19)?”), the second referring to the perceived risk that a friend or a neighbor will be infected (How likely is it that your average friend, or your average neighbor, will become infected with coronavirus (SARS-CoV-2/COVID-19)?”), and the last referring to the perceived risk that a fellow countryman will be infected (“How likely is it that your fellow countrymen will become infected with coronavirus (COVID-19)?”). To obtain a measure of general perceived likelihood of infection, I computed the mean between these two items,  $M = 6.00$ ,  $SD = 2.10$ .

## Results

To test the impact of conspiracy beliefs on vaccine compliance and the mediating role of trust in science, I ran a mediation model using the software JASP (Love et al., 2019) with bootstrapping for 5,000 resamples and 95% confidence intervals (Preacher & Hayes, 2008) and taking into account the perceived likelihood of infection and perceived severity of COVID-19 as background confounders. The mediation model confirmed that conspiracy beliefs had an indirect effect via trust in science on vaccine compliance: indirect effect:  $b = -0.10$ ,  $SE = 0.01$ , 95% CI = [-0.13, -0.73]. The total effect was partially mediated: direct effect:  $b = -0.10$ ,  $SE = 0.03$ , 95% CI = [-0.16, -0.02], total effect;  $b = -0.19$ ,  $SE = 0.03$ , 95% CI = [-0.26, -0.12] (see Figure 15).

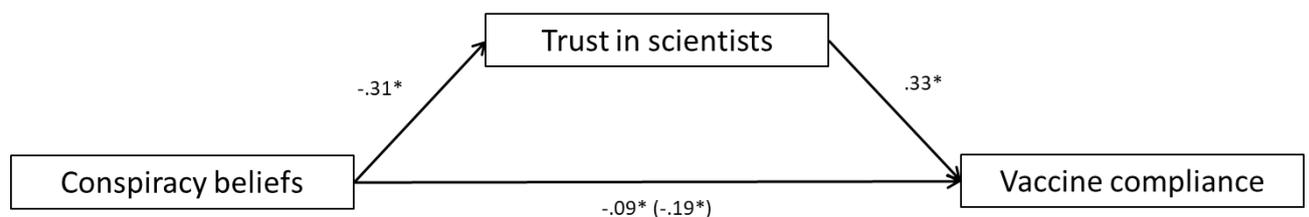


Figure 15. Path model for vaccine compliance with standardized coefficients.

## Discussion

Study 8b replicated the results of Study 8a. Moreover, this study involved different countries that had different experiences with COVID-19 at the moment of the measurements. At the same time, the mediation analysis of this study took into account also the potential confounder role of perceived severity of COVID-19 infections. Once again, the study provides evidence about the nature of the impact of conspiracy beliefs, showing that they affect behaviors that are related to outgroup members' positions.

In these studies, I provided initial evidence for a link between conspiracy beliefs and tribalism. While different conspiracy theories can lead to conspiracy beliefs characterized by different contents, it seems that all outcomes follow the pattern of tribal biases. Indeed, in Study 6 it was found that conspiracy beliefs mediated the effects of economic inequality only for collective actions oriented to implement new policies that challenge the status quo. These policies were indeed oriented to empower non-élites group members (i.e., the implementation of a minimum wage), or to penalize élites group members (i.e., the implementation of a wage cap). Moreover, in Study 7 it emerged that conspiracy beliefs were positively associated with the perception of taxes as a penalization rather than a contribution to society, and they were coherently associated with lower levels of tax compliance. However, conspiracy beliefs were positively associated with support for progressive taxation, which implies that people holding conspiracy beliefs endorse taxation when outgroup members are penalized by it. Moving from the topic of economic inequality to the one of vaccine compliance, coherent evidence was found in Study 8a and 8b. Indeed, both studies showed that the link between conspiracy beliefs and vaccine hesitancy is mediated by the distrust towards scientists. In such context, scientists are outgroup members that generally produce vaccines and promote vaccinations, and the tribal bias is expressed through opposition to their suggestions. These results can help to reconcile past findings related to the consequences of conspiracy beliefs. In particular,

related to the impact of conspiracy beliefs on civic participation and collective actions, past studies reported apparently contradictory results. In particular, in some studies conspiracy beliefs were associated with lower civic participation (e.g., Jolley & Douglas, 2014; Norasakkunkit & Uchida, 2011), whereas other studies revealed higher collective action intentions (Ionescu et al., 2020; Kim, 2019; Imhoff et al., 2021). However, the general process of tribalism can explain such apparent contradictions. The conspiracy-prompted behavioral responses appear indeed influenced by the content of conspiracy theories and the relationship between the blamed outgroups and behaviors. Thus, in the context of economic inequality, tribalism is expressed by promoting actions against economic élites and by supporting taxation when it penalizes the outgroup. Differently, in the context of vaccine compliance, tribalism is expressed by non-compliance, and therefore apparent inaction, to scientists' guidelines. It is important to highlight that while tribalism is here used to interpret these results, but the relationship between conspiracy beliefs and tribalism was not tested here. Future studies should test this potential and plausible relationship to confirm or reject the hypothesis that conspiracy beliefs prompt tribalism.

## **Chapter 9 – Conspiracy theories online communication**

In the previous chapters, I focused on the psychological and social antecedents of conspiracy beliefs. However, it is important to highlight that the propositional content of conspiracy beliefs often is based on the content of specific messages, namely, conspiracy theories. The feature and spreading of conspiracy theories represent a topic in between the antecedents and consequences of conspiracy beliefs. Indeed, exposure to conspiracy theories increased conspiracy beliefs, and at the same time endorsing conspiracy beliefs increase the likelihood to look for conspiracy theories and conspiracy narratives (Einstein & Glick, 2015, Salvador Casara et al., 2019).

To understand conspiratorial thinking is therefore necessary to have a picture of the environment in which people retrieve and share information. In particular, the increased popularity of the Internet and Web 2.0. had a dramatic effect on how people produce, retrieve, consume, and interpret information. Indeed, in general, access to information on the Internet is easier compared to traditional media. Internet users have the possibility to access news about current events almost instantly. Moreover, the Internet gives the opportunity to get instant information about events happening in every part of the world. Sources of information can be very different, while it is possible to find news coming from the most famous news agencies and online journals, it is also easy to find information from blogs, forums, and social media posts. In other words, on the Internet users have the opportunity to be not only consumers but also producers of information, and therefore easily express their beliefs and opinions about any type of topic. This means that while it is possible to hear the voices of experts, or of direct witnesses of events, a consistent amount of information can be produced by non-expert users. At the same time, others can purposely share false claims and present them as news (i.e., fake news) in order to deceive users and increase the circulation of certain pieces of information for financial and political reasons (and here we are getting to actual conspiracies).

Furthermore, the development of social media, like Facebook and Twitter, has also given new tools for political communication. Everybody with an Internet connection can easily follow relevant public figures, politicians can promote their political agenda and engage potential voters with daily communications. In comparison with traditional media, communication on social media can be more frequent. Moreover, potential voters can feel free to directly communicate with politicians.

Finally, social media has also provided online environments where people can build social communities, discuss, share opinions, and organize for collective actions. In particular, social media allows users to get access to a digital space in which they are able not only to get information from a great variety of sources but also to create and co-create content with other users. Moreover, virtual communities without the boundaries of time and space typical of offline communities can include a larger number of activists and permit to create and organize large and intercultural communities on the basis of shared interests, values, and characteristics (Fuchs & Sandoval, 2014).

While the opportunities to have easy access to a vast amount of information, to get in touch with political discourse daily, and to affiliate with other people with similar interests, values, and goals, can lead to several positive outcomes (Ciszek, 2016; Yang, 2016), it is also relevant to highlight how these opportunities interact with conspiratorial thinking.

As already mentioned, conspiratorial thinking is based on intuitive emotional reasoning (van Prooijen & Douglas, 2018). While analytic thinking, in comparison with intuitive thinking, generally leads to more accurate interpretations of reality, it also requires more cognitive effort, time, and expertise (Hogarth, 2014). Due to the fact that the amount of online information is so vast, noisy and contradictory, it is unrealistic to expect that people use only analytic reasoning (Bridle, 2010; Bawden & Robinson, 2009). Moreover, information complexity creates also the precondition for epistemic needs to emerge. To make sense of this

complex social environment, and without the possibility of systematically analyzing every piece of information, people may believe in conspiracy theories that give an easy interpretation of reality. Furthermore, not all online information is produced with the aim of giving explanations or increasing the knowledge of users about specific topics, but it can be produced with a persuasive purpose. To reach this goal, websites can create and spread fake news, which may use conspiratorial narratives in order to engage users due to their entertainment value (van Prooijen et al., 2021). For example, from the beginning of the COVID-19 pandemic, a large amount of information was produced (Naeem & Bhatti, 2020), providing a big challenge to evaluate the veracity of the online content. The spread of this big amount of information related to COVID-19 gave the opportunity to observe the features of fake news and their relationship with conspiratorial narratives. Thus, in Study 9, I explored the content of fake news related to COVID-19 and detected to which extent conspiratorial narratives are part of this type of communication.

Furthermore, the presence of political figures on the Internet can give ideological facets to online information and to public discourse. Since existential needs prompt conspiracy beliefs, and conspiracy beliefs seem to further fuel those needs (Douglas et al., 2019), politicians may propose conspiratorial narratives to drive the public attention toward potential threats, and therefore facilitate Agenda-setting and social influence processes. For example, during the referendum for Brexit, conspiracy narratives were used to derogate immigrants, assuming a relevant role in persuading people to vote for the “leave” (Swami et al., 2018). Indeed, conspiracy beliefs appear to be specifically associated with one political ideology, namely, Populism. From a communication point of view, it is unclear whether conspiracy theories and populism share similar language and rhetoric approaches. Thus, In Study 10, I will investigate the relationship between conspiratorial and populist rhetoric.

The Internet provides an environment where people can affiliate and build online communities. This means that people holding conspiracy beliefs can find other people sharing similar beliefs to interact with. Group affiliation can have important functions for people believing in conspiracies: social needs are the third motivational need driving conspiracy beliefs, and online communities can address them. Group affiliation can further provide answers and promote a sense of collective effectiveness, thus they may also address epistemic and existential needs. However, there is still a lack of research about the language used by people holding conspiracy beliefs and how their language may be influenced by their psychological needs (Klein et al., 2019; Fong et al., 2021). Thus, in Study 11, I will investigate the language used in conspiratorial and non-conspiratorial online communities, with a focus on the platform Reddit, which allows for longer communication exchanges compared to other social media which are characterized by a strict word limit (e.g., Twitter).

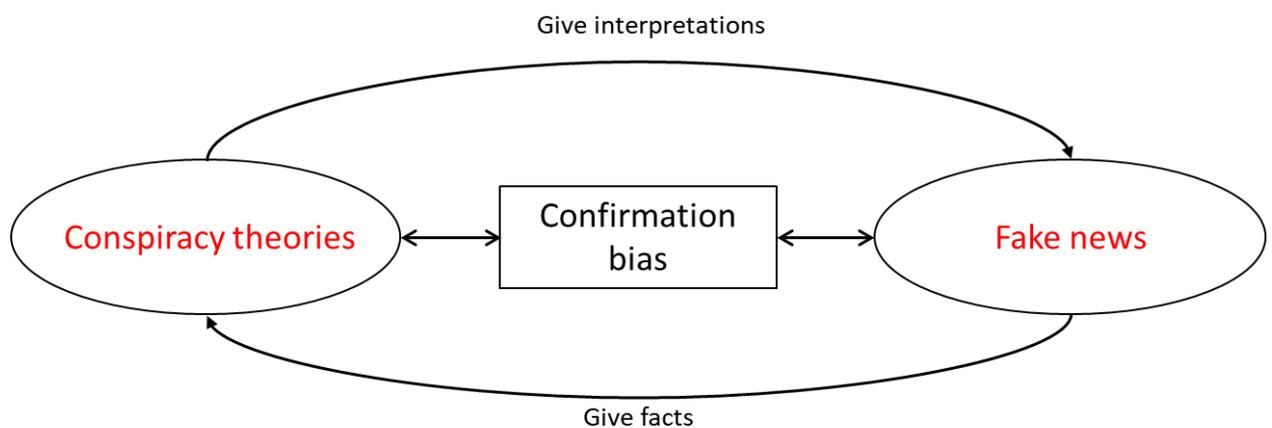
This set of three studies will provide an initial picture of the characteristics of conspiratorial messages on the Internet. Finally, I will test whether conspiratorial rhetoric can affect the persuasiveness of messages. For this reason, in Study 12, I ran an experiment where participants evaluated the credibility and their intention to comment on messages featured by a conspiratorial rhetoric or not.

### **Study 9. Covid-19 fake news and conspiracy theories**

Fake news are “news articles that are intentionally and verifiably false, and could mislead readers” (Allcott & Gentzkow, 2017, p. 213). Although fake news are not new phenomena, nor were they born on the Internet (Tandoc et al., 2018), they have become popular in public and academic discourse in recent years. Recently, the interest in fake news has risen due to the large amount of information spread about COVID-19. Indeed, several institutions have recognized the potential threat of fake news for health and democracies. For example, the World Economic Forum (2020) highlights the need to contrast fake news to protect citizenship from the virus, stating that: “*Weak systems let pathogens and diseases spread because they fail to address fake news about healthcare and preventive care, psychological responses of fear and despair, and lack of compliance with health professionals’ requests.*”. Moreover, several actions were taken to contrast the diffusion of fake news. For example, several institutions, such as the European Commission, have published guidelines to contrast the diffusion of fake news. Furthermore, relevant online journals, such as the BBC and the Washington Post, have started a section that focuses on fact-checking news. In several countries, a number of governmental websites have been opened specifically to debunk fake news (e.g., Italian Ministry of Health, Center for Disease Control and Prevention).

Recently, various scholars highlighted that conspiracy theories and fake news are terms often used with similar meanings, with the result of producing conceptual fuzziness (Schatto-Eckrodt et al., 2020). Indeed, fake news have important differences and similarities with conspiracy theories. While many conspiracy theories are indeed false, veracity is not a necessary feature of conspiracy theories. Moreover, by definition, fake news are built with the goal to deceive the readers, thus their main function is to persuade the readers. To do this, fake news contains fabricated events that require interpretation. Differently, conspiracy theories have an explanatory function: They provide an explanation to events (i.e., powerful groups’

secret actions are the cause of events). Thus, while fake news and conspiracy theories are two separated concepts, they are likely to occur together as they seem to have a potential complementary role to each other: fake news gives fabricated events that can be interpreted with conspiracy theories. Furthermore, endorsement of fake news and conspiracy beliefs are driven at least by a common psychological mechanism, namely, confirmation bias. In other words, fake news and conspiracy theories are two distinct but yet related communication constructs that complement each other and are prompted by similar psychological processes (see Figure 16).



*Figure 16.* Relationship between conspiracy theories and fake news

However, there is a lack of empirical research showing how relevant are conspiracy theories for the contents of fake news. For this reason, I ran an exploratory study in which I analyzed the fake news about COVID-19 collected by EUvsDISINFO, namely the flagship project of the European External Action Service's East StratCom Task Force to help citizens in Europe and beyond develop resistance to digital information and media manipulation. The goal of the study is to detect the prevalence of conspiratorial narratives in COVID-19 related fake news.

## Method

The sample consisted of 451 COVID-19 related fake news articles retrieved from the EUvsDISINFO database. EUvsDISINFO is a project of the European External Action Service established in 2015. Its main activities are to identify, compile, and expose disinformation cases originating in pro-Kremlin media that are spread across the EU and Eastern Partnership countries. All articles were retrieved using the keyword “coronavirus” and were from January 2<sup>nd</sup>, 2020 to September 21<sup>th</sup> 2020. No institutional ethical approval was necessary for this study, as the data collected were already public. To apply structural topic models to the documents, I used the *stm* package (Roberts et al., 2019) of the software R (R Core Team, 2019). The Structural Topic Model is based on the assumption that documents are produced from a mixture of topics. Topics are then generated from a distribution of words. Based on these assumptions, STM generates topics of correlated words and assigns to each document a proportion of each topic. The function *textProcessor()* was used to clean the text. In order to decide the number of topics to extract, I compared the held-out likelihood, a fit index widely used for this purpose (Wallach et al., 2009), of models containing from 2 to 30 topics, it emerged that the optimal number of topics was 8. Finally, the 8 topics were automatically extracted with the function *stm()*.

## Results

The most representative (i.e., high frequent yet exclusive) words for each topic are reported in Table 1. A qualitative analysis of the most discriminating terms of the 8 topics, and the content of the document of each topic, highlighted that conspiracy narratives were common topics in the documents. In particular, topics 5, 6, 7, and 8 were related to several different conspiracy theories. Conspiratorial topics were related to the claims that the coronavirus is a bioweapon fabricated in laboratories (topic 5), the COVID-19 vaccines are useless and used only for business reasons (topic 6), COVID-19 is not different from seasonal

flu and domestic remedies are effective (topic 7), and that lockdowns are used in order to make the economy collapse (topic 8). These topics combined have 37% of the prevalence in the documents. Other topics were related to quantitative information, like the number of cases, about COVID-19 and recommendations provided by experts (topic 1), criticizes to the European Union (topic 2), and news related to the Middle East (topic 3) and Ukrainian situation.

*Table 1*

*List of Topic, most discriminating terms, topic labels, and topic proportions within the corpus of text.*

<b>Topic</b>	<b>Most discriminating terms</b>	<b>Topic label</b>	<b>Topic proportion</b>
1	expert, russian, thousand, outbreak, case, infect, detect, number, ill, mortal, recal, coronavirus, spread, recommend	Covid-19 statistics and recommendation	.20
2	brussel, european, baltic, union, europ, schengen, italian, germani, solidar, eastern, assist, itali, alli, czech, parliament, greec	Criticizes to Europe Union	.16
3	corona, syrian, sanction, syria, america, confront,	USA sanctions against Iran and interventions in	.13

	iranian, iran, effort, intern, conflict, accus, west, disinfor	Syria	
4	zelenski, ukrainian, ukrain, belarusian, brigad, opposit, kiev, donbass, church, fire, arm, ossetia, region, georgian	Covid-19 situation related to Ukrain	.13
5	laboratori, pentagon, research, pathogen, biolog, bat, wuhan, anim, biosafeti, detrick, scientist, weapon, studi, carrier, strain, genom	Covid-19 bioweapon conspiracy theory	.11
6	gavi, gate, bill, vaccin, foundat, microsoft, pharmaceut, melinda, cdc, immun, bodi, influenza, inject, test, trial, pharma, rockefel	Covid-19 vaccine conspiracy theory	.09
7	wash, vitamin, british, empir, tusk, climat, saudi, intraven, britain, trump, sun, narrat, higien	Covid-19 negationism	.09
8	protest, freedom, food, law, worker, euro, rule, car, ton, cross, warsaw, stagnat, riot, berlin, german, empti, travel, lockdown	Covid-19 economic consequences conspiracy theory	.08

## Discussion

This first study highlighted the relevance of conspiratorial narratives in online fake news, showing that in a large sample of COVID-19 related fake news articles, conspiratorial claims are widely used. This analysis also provided valuable insights related to the content of COVID-19 conspiracy claims. In particular, it emerged that two contradictory conspiracy theories are commonly spread: The idea that the coronavirus is a lethal bioweapon fabricated in laboratories, and the idea that coronavirus is not more dangerous than seasonal flu. Conspiracy theories seem also to directly tackle the most effective remedies to manage COVID-19, namely vaccination (Baraniuk, 2021), which is depicted as useless and promoted only for economic interests, and lockdown (Flaxman et al., 2020), which is considered a tool for pursuing a strategic collapse of the economy.

Furthermore, this analysis supports the idea that conspiracy theories (even if conceptually are not necessarily false information) are widely used in fake news. Indeed, fake news are used to deceive users and to promote political ideology. Conspiratorial claims seem to be used to directly derogate political antagonists or to give an alternative interpretation of specific situations.

While this study provides an initial picture of how conspiracy theories are used online, with a focus on fake news and the COVID-19 situation, questions remain on whether conspiracy narratives can find the favor of online users and whether they are an effective tool for propaganda. Moreover, this study did not take into account the psycholinguistic features of fake news and conspiracy texts. Finally, online news is not the only way to spread information on the Internet, and in recent years the role of online influencers, and social media communities became particularly prominent. To provide an exhaustive picture of the communication of conspiracy online, Study 10 and Study 11 focus on political leaders' communication on Twitter and social media content on Reddit.

## **Study 10. Political communication on Twitter and Conspiracy rhetoric**

*Another analysis of this study is published in:*

Salvador Casara, B. G., Erseghe, T., & Suitner, C. (2020). Immigrazione, stili e temi: uno studio sui tweet dei politici italiani. *Ricerche di Psicologia*, 351-371.

This study was designed to explore the communication relationship between conspiratorial and populist rhetoric and their impact on messages' popularity. Populism is generally defined as a "thin ideology" (Krämer, 2017), meaning that it generally covers less political and social topics than classic ideologies such as liberalism and conservatism. According to Muis & Immerzeel (2017), one of the main features of populism is its focus on dividing the world between the people, which is honest and good, and the elites, untrustworthy and dishonest. Another feature is that authorities are deliberately challenged. The challenge to authorities generally pertains a call to action for the middle class, to challenge progressives' ideologies which are perceived as dominating ideologies. Moreover, populist movements are willing to act to reappropriate the power they feel to have in the past, which is nostalgically perceived as glorious. Finally, populist movements are generally anti-multiculturalism and anti-globalization, as they feel that these processes lead to losing their national social identity (Hogan & Haltinner, 2015). Populism has been interpreted also as a communication style (Jagers & Walgrave, 2007). In particular, populist rhetoric has been characterized by the focus on social exclusion, anti-elitism, and people-centrism (Heiss et al., 2019). Social exclusion refers to the tendency of derogating outgroup members (i.e., whoever is not part of "the people"). Anti-elitism refers to the blaming of the political and intellectual establishments not to act in the interests of citizens. People-centrism refers to the tendency of praising ordinary people and their values. Due to the feature of both populist ideology and rhetoric, social media represent a privileged channel for the political communication of populist movements. Indeed, populist movements and leaders can build on social media a

communication campaign particularly coherent with the key aspects of populist rhetoric. For example, differently from traditional media, social media contents are perceived as built by the common people, rather than controlled by the elites (Heiss et al., 2019). Moreover, coherently with the people-centric facet of populism communication, social media give the possibility to share and comment on the posts of ordinary citizens. For example, during the 2016 American Presidential Elections, Donald Trump was the only candidate to share messages of ordinary citizens, while his political rivals shared more news produced by traditional media (Baldwin-Philippi, 2019).

Past research highlighted relevant commonalities between populism and conspiracy thinking. Indeed, both of them have as core features an anti-establishment sentiment and outgroup derogation. Moreover, both conspiracy beliefs and populism are associated with feelings of powerlessness (van Prooijen & Acker, 2015). However, while past research connected the ideological facets of populism and conspiracy beliefs (Castanho Silva et al., 2017), it is still unclear whether populist and conspiratorial rhetoric are associated. Moreover, it is not clear whether these rhetoric styles have a positive impact on messages' popularity. In order to fill these gaps, I ran a study on the social media Twitter. Specifically, in this study, I analyzed Twitter messages of Italian political leaders, and I tested the relation between conspiracy and populist rhetoric and whether populist rhetoric mediates the popularity of conspiracy messages. As conspiracy beliefs prompt anxiety, uncertainty, and distrust of authorities and institutions, it is plausible that populist rhetoric may take advantage of it by showing to potential voters that there is a political alternative to the elites and the establishment, thus, messages containing conspiracy rhetoric would be more likely to use also populist rhetoric (H1). As potential voters receive reassurance for conspiratorial threats, they may be more willing to like and share the message. For this reason, I expect that messages containing conspiracy rhetoric will be more liked and shared (H2); and that the association

between conspiracy rhetoric and messages' popularity will be mediated by populist rhetoric (H3).

## **Method**

I collected, using the software R (R Core Team, 2019), 23000 messages sent from April 15, 2014 to May 13<sup>8</sup>, 2019, from the Twitter accounts of Silvio Berlusconi, Laura Boldrini, Emma Bonino, Luigi Di Maio, Giorgia Meloni, Matteo Renzi, Matteo Salvini, and Nicola Zingaretti. I chose these politicians based on a relevance criterion. Indeed, these Italian politicians were the leaders of their parties and movements at the moment of data collection. Specifically, these parties were Forza Italia, Fratelli d'Italia, Movimento 5 Stelle, Lega, Liberi Uguali, Partito Democratico and Più Europa. Matteo Renzi was the only politician who was not a Party leader at the moment of the data collection, but he was included as he was the leader of Partito Democratico for most of the period of the collected data. The total number of messages retrieved was determined by software capabilities. Moreover, to have a smaller but yet representative dataset that could be manually coded, I randomly sampled 125 messages for each politician, for a total of 1000 messages. After that, we excluded 26 messages as they contained only links to websites or did not contain any sentences. Thus, the final sample contained 974 messages. As Kline (2016) suggested a ratio of 20 participants for each estimated parameter in Structural Equation Models, this sample size was more than sufficient to provide enough statistical power to path analyses with 6 estimated parameters. No institutional ethical approval was necessary for this study, as the data collected were already public.

## **Measures**

### **Populist rhetoric**

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<sup>8</sup> Further analyses of these data are available at Salvador Casara et al. (2020).

A coder, unaware of the author of the messages, coded each message assigning a score from 1 to 10 for the three populist dimensions elaborated by Heiss et al. (2019). These dimensions were:

1. Anti-elitism: the tendency to blame élites (intellectual, economic, political) for societal issues.
2. Social exclusion: the tendency to antagonize other social groups.
3. People-centrism: the tendency to communicate closeness with “ordinary people” and promote the virtues of citizens, perceived as ordinary and sincere.

### **Conspiracy rhetoric**

The coder assigned a score of +1 when the message suggested the presence of groups that deliberately act against the population (N = 294), -1 when the message debunked this type of narrative (N = 19), and 0 when the message referred to neither of these situations (N = 660). As debunking messages were particularly few (N = 19), and I did not have specific hypotheses for that type of message, I dichotomized the variable into conspiracy vs. non-conspiracy messages.

### **Message’s popularity**

We used the number of times a message was liked (favorite counts) and shared (retweet counts) on Twitter as measures of messages’ popularity.

Finally, a number of other variables were coded from the messages’ texts. However, as they are not relevant for the current analysis, they will not be reported here. The full list of variables can be found in Salvador Casara et al. (2020).

## Results

To test my hypotheses, I ran two multilevel mediation models using the software R (R Core Team) with bootstrapping for 5,000 resamples and 95% confidence intervals (Preacher & Hayes, 2008). In both models, for the single message data (Level 1), conspiracy rhetoric was the distal predictor, and populist rhetoric was the mediating variable. The final output of the models was the message's popularity: the number of times a message was liked in Model 1, and the number of times the message was shared in Model 2. Finally, in both models I controlled the relationship for the politician differences (Level 2: allowing for random intercepts). The first mediation model (see Figure 17) confirmed that conspiracy rhetoric had an indirect effect populist rhetoric on favorite counts: indirect effect:  $b = 0.26$  ( $SE = 0.03$ ), 95% CI = [0.11, 0.23]. The total effect was fully mediated: direct effect:  $b = -0.05$  ( $SE = 0.07$ ), 95% CI = [-0.17, 0.08], total effect;  $b = 0.12$  ( $SE = 0.06$ ), 95% CI = [0.01, 0.24]. It is due to notice that intraclass correlation for favorite count was ICC = 0.28, meaning that a consistent part of the variance (28%) is attributable to between-politician differences.

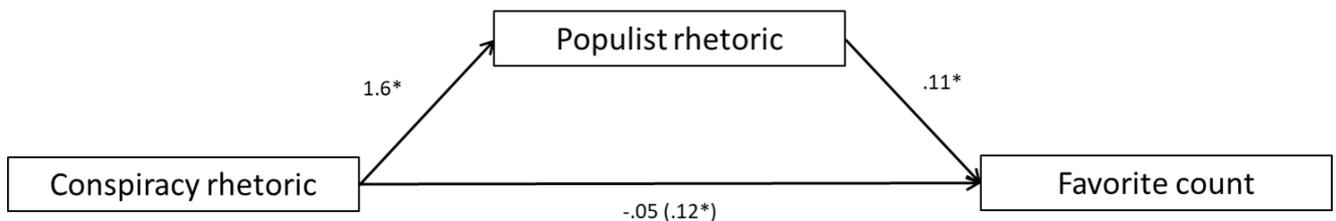


Figure 17. Path model for favorite count with standardized coefficients.

Moreover, the second mediation model (see Figure 18) confirmed that conspiracy rhetoric had an indirect effect on populist rhetoric on retweets: indirect effect:  $b = 0.21$  ( $SE = 0.03$ , 95% CI = [0.14, 0.27]). The total effect was fully mediated: direct effect:  $b = 0.11$  ( $SE = 0.07$ ), 95% CI = [-0.10, 0.17], total effect;  $b = 0.24$  ( $SE = 0.07$ ), 95% CI = [0.11, 0.36]. It is due to notice that intraclass correlation for retweet count was ICC = 0.16, meaning that a consistent part of the variance (16%) is attributable to between-politician differences.

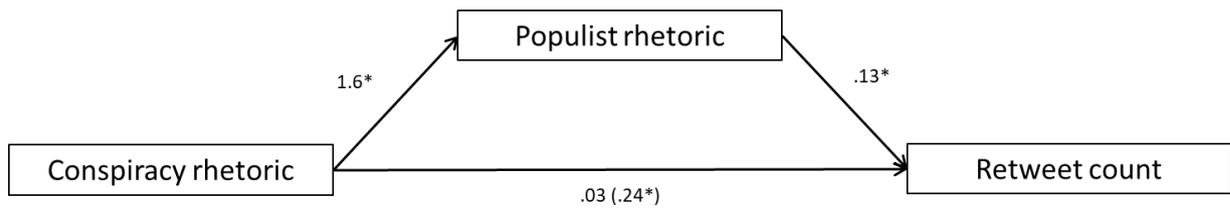


Figure 18. Path model for Retweet count with standardized coefficients.

## Discussion

The results supported the hypotheses. Messages using conspiracy rhetoric were more liked and shared, and this association was mediated by populist rhetoric. It is possible that while the conspiracy rhetoric grabs the attention of voters with specific psychological needs and then the populist rhetoric offers a political response to those needs. Indeed, conspiracy beliefs emerge due to epistemic, existential, and social needs, but they do not necessarily satisfy these needs. Differently, the populism rhetoric expressed by political leaders may actually provide answers for a specific situation, suggest political actions that are proposed as solutions, and suggest that it is possible to obtain political membership with potential benefits for the sense of belonging and community.

While previous studies already reported that conspiracy beliefs are associated with positive attitudes toward populism movements, this study showed that there is also an association in the way conspiracy theories and populism are communicated. However, this study has several limitations. The messages were hand-coded by just one coder, however, for this relatively small number of messages, hand-coding is still more reliable than any automated text analysis procedure (Drieger, 2013), including Natural Language Processing. Furthermore, the correlational design of this study does not provide evidence for the directionality of the effects proposed. Indeed, here I stated that populist rhetoric is the second step of conspiratorial communication, aimed to satisfy the psychological needs prompted by conspiracy beliefs. However, it is still possible that communication theorizing a conspiracy is

a communicative tool used by populist propaganda to grab the attention and the trust of voters. Future research is required to further explore the relationship between conspiracy theory, populism, and psychological needs. Finally, the results of this study are very specific for the Italian political leaders, and they are hardly generalizable to other political contexts. Cross-national studies are required to replicate our results in different contexts.

## **Study 11. Online communities and conspiratorial language**

In the previous studies, I focused on the impact of communications that were aimed to be “One-to-many”. Messages that are shared through fake news or by politics are likely created to affect the receivers. This type of communication sees internet users just as receivers of messages, whereas the interactions among users represent a core feature of the Web 2.0. For this reason, this study was developed to focus on the language expressed by users that are engaged in “many-to-many” conversations. Indeed, the Internet allows people to connect to others and create environments where users can easily communicate with very limited geographical boundaries. People sharing similar values, attitudes, and opinions can join in a collective discourse, and build online social communities. One of the most popular social media used for this aim is the platform Reddit. Reddit is a very popular website with more than 48 millions active registered users in 2019. In this social media, discourses are organized by topics in user-generated communities. These communities are about very different topics, like sports, casual conversations, politics, and also conspiracy theories. Different from Twitter, messages can be very long, allowing in-depth conversations and sharing of very detailed information. Moreover, while registration is mandatory to participate in the conversations or join the communities, the messages are public also for non-registered users. Like Twitter, Reddit allows to mine texts with its API interface. By analyzing the text contained to Reddit, it is possible to investigate how members of specific communities communicate, and it is possible to directly compare different communities. Overall, Reddit represents an interesting social environment allowing the study of the actual behavior of people sharing conspiracy theories and psycholinguistic features of online communities. Not surprisingly, some research has already used Reddit in order to investigate conspiracy beliefs. For example, Klein and colleagues (2019), analyzed r/conspiracy subreddit users’ language and posting behavior. In particular, they found that users of the conspiratorial community (vs. other Reddit users) used

more words related to power and fewer words related to social bonding, were more active on Reddit, and joined more communities. Moreover, Samory and Mitra (2018) analyzed the users' activity in the same subreddit following dramatic events, providing evidence that dramatic events reinforce conspiracy theory communities. However, this research focused on comparisons among Reddit users, whereas there is still a lack of research related to how conspiracy theory communities differentiate their language in comparison with other Reddit-based communities. In order to fill this gap, the main aim of this study was to explore the psycholinguistic of the r/conspiracy community and to compare it with a general conversation community (r/casualconversations), a political community (r/politics), and a debunking community (r/skeptic). In particular, I explored whether relevant dimensions of conspiracy beliefs were mirrored in the language of the conspiracy theories community. First, as conspiracy beliefs are based on emotional thinking, I tested if the expression of emotions were stronger in the conspiracy theories community in comparison with the other communities (H1). Second, as power represents another relevant dimension for conspiracy beliefs, I explored how power-related language was used in the conspiracy theories community in comparison with the other communities (H2). Third, as conspiracy beliefs are strongly based on intergroup conflict, I tested whether the language of the conspiracy theories community focuses more on creating intergroup salience than the other communities (H3). Fourth, as previous research reported that conspiracy beliefs try to respond to epistemic needs, I tested whether the language of conspiracies-related communities focused more on causations and insight than the other online communities (H4). Finally, in line with the idea that conspiracy beliefs are prompted by social needs, I tested whether the language of the conspiracy-related community focused more on affiliation-related words than the other online communities (H5).

## Method

**Data collection.** To extract the messages from Reddit, I used the package `RedditExtractor` (Rivera, 2015). To select the communities, I used 4 keywords (i.e., “conspiracy”, “conversation”, “politics”, and “debunking”), and I choose the most popular community associated with each keyword (i.e., “r/conspiracy”, “r/casualconversation”, “r/politics”, “r/skeptic”, see Table 2 for more details). For each subreddit, I extracted the 100 more recent webpages. This number was decided to have a high-powered sample taking into account the computational hardware limits. A number of 142566 messages were retrieved from the 27<sup>th</sup> of April 2021 to the 8<sup>th</sup> of August 2021. No institutional ethical approval was necessary for this study, as the data collected were already public.

*Table 2*

*Name, community self-description (if available), and number of members for each Reddit community.*

<b>Name</b>	<b>Community self-description</b>	<b>Number of members</b>
r/conspiracy	The conspiracy subreddit is a thinking ground. Above all else, we respect everyone's opinions and ALL religious beliefs and creeds. We hope to challenge issues which have captured the public's imagination, from JFK and UFOs to 9/11. This is a forum for free thinking, not hate speech. Respect other views and opinions, and keep an	1.6 million

	open mind.** **Our intentions are aimed towards a fairer, more transparent world and a better future for everyone.	
r/CasualConversation	The friendlier part of Reddit. Have a fun conversation about anything that is on your mind. Ask a question or start a conversation about (almost) anything you desire. Maybe you'll make some friends in the process.	1.6 million
r/Politics	/r/Politics is for news and discussion about U.S. politics.	7.7 million
r/Skeptics	r/Skeptics does not provide a self-description. It is a subreddit that focuses on debunking fake news, misinformation, and conspiracy theories.	156 thousand

**Linguistic analysis.** I content-analyzed all messages collected using the Linguistic Inquire and Word Count 2015 (LIWC, Pennebaker et al., 2015), a well-established dictionary-based tool for textual analysis of psychological processes. More specifically, the LIWC assumes that psychological constructs are expressed by language, therefore, it predefines a list of words associated with those constructs. Every message receives a score on several word categories based on the number of words belonging to the specific category adjusted for the total number of words within the message. Coherently with the aims of this investigation, LIWC categories were used to map the following main concepts:

- a) **Positive and negative emotions.** The scores for the category negative emotions, which includes negative emotions like anxiety and anger, and positive emotions, which includes positive emotions like hope and happiness, were used for measuring the expression of emotions within the text.
- b) **Empowerment.** Empowerment scores were obtained by the aggregation of a mean of the LIWC scores for the categories power and achieve,
- c) **Epistemic answers.** I computed the mean of the insight and cause LIWC scores to assess whether messages focus on giving epistemic answers.
- d) **Group-identity salience.** The use of personal pronouns was used to assess outgroup and ingroup salience. In particular, the use of we and they represent a proxy of the salience of group membership. In particular, the use of the third person plural (e.g., they, them, theirs) is associated with outgroup focus, whereas first-person plural (e.g., we, us, ours) is associated with ingroup focus (Fong et al., 2021).
- e) **Affiliation.** I used the scores for the category affiliation, which comprised words like *ally*, *friend*, *social*, were used for measuring the sense of community orientation within the text. Past research proved that this category is a good index of implicit motives for affiliation (Schultheiss, 2013).

## Results

### Positive emotions

The results of an ANOVA with positive emotions scores as dependent variable and subreddits as predictors show that the expression of emotion within texts was significantly different across communities  $F(3,142562) = 1163.03, p < .001, \eta^2 = 0.024$ . In particular, the results of a post-hoc comparison with Bonferroni's correction, show that messages in the casual conversation community express more positive emotion ( $M = 7.09, SD = 9.91$ ) than the conspiracy ( $M = 3.72, SD = 7.41, p < .001, d = 0.40$ ), the politics ( $M = 3.72, SD = 6.68, p <$

.001,  $d = 0.46$ ), and the skeptic ( $M = 3.20$ ,  $SD = 6.15$ ,  $p < .001$ ,  $d = .48$ ) communities.

Moreover, the conspiracy community did not significantly differ from the politics community ( $p = 1$ ,  $d = 0$ ), but it expresses more positive emotions than the skeptic community ( $p < .001$ ,  $d = 0.06$ ).

### **Negative emotions**

The results of an ANOVA with negative emotions scores as dependent variable and subreddits as predictors show that the expression of emotion within texts was significantly different across communities  $F(3,142562) = 214.82$ ,  $p < .001$ ,  $\eta = 0.005$ . In particular, the results of a post-hoc comparison with Bonferroni's correction, show that messages in the casual conversation community express less negative emotion ( $M = 1.98$ ,  $SD = 4.22$ ) than the conspiracy ( $M = 2.76$ ,  $SD = 5.62$ ,  $p < .001$ ,  $d = 0.15$ ), the politics ( $M = 3.13$ ,  $SD = 5.64$ ,  $p < .001$ ,  $d = 0.21$ ), and the skeptic ( $M = 2.80$ ,  $SD = 5.01$ ,  $p < .001$ ,  $d = .17$ ) communities.

Moreover, the conspiracy community did not significantly differ from the skeptic community ( $p = 1$ ,  $d = 0$ ), but it expressed less negative emotions than the politics community ( $p < .001$ ,  $d = 0.06$ ).

### **Empowerment**

The results of an ANOVA with empowerment scores as dependent variable and subreddits as predictors show that the expression of power-related words within texts was significantly different across communities  $F(3,142562) = 870.196$ ,  $p < .001$ ,  $\eta = 0.018$ . In particular, the results of a post-hoc comparison with Bonferroni's correction, show that messages in the casual conversation community express fewer power-related words ( $M = 1.53$ ,  $SD = 2.60$ ) than the conspiracy ( $M = 1.81$ ,  $SD = 2.94$ ,  $p < .001$ ,  $d = 0.10$ ), the politics ( $M = 2.48$ ,  $SD = 3.30$ ,  $p < .001$ ,  $d = 0.30$ ), and the skeptic ( $M = 1.63$ ,  $SD = 2.46$ ,  $p = .004$ ,  $d = .04$ )

communities. Moreover, the conspiracy community expresses more power than the skeptic ( $p < .001, d = .06$ ), but less than the politics community ( $p < .001, d = 0.21$ ).

### **Epistemic salience**

The results of an ANOVA with epistemic salience scores as dependent variable and subreddits as predictors show that the expression of epistemic-related words within texts was significantly different across communities  $F(3,142562) = 482.351, p < .001, \eta = 0.010$ . In particular, the results of a post-hoc comparison with Bonferroni's correction, show that messages in the casual conversation community express fewer epistemic-related words ( $M = 1.973, SD = 2.56$ ) than the conspiracy ( $M = 2.43, SD = 3.18, p < .001, d = 0.15$ ), the politics ( $M = 2.09, SD = 2.87, p < .001, d = 0.04$ ), and the skeptic ( $M = 2.84, SD = 3.12, p < .001, d = .30$ ) communities. Moreover, the conspiracy community used fewer epistemic-related words than the skeptic ( $p < .001, d = .13$ ), but more than the politics community ( $p < .001, d = 0.11$ ).

### **Group Identity Salience**

#### ***Ingroup salience***

The results of an ANOVA with "We" scores as dependent variable and subreddits as predictors show that the use of the first-person plural within texts was significantly different across communities  $F(3,142562) = 125.522, p < .001, \eta = 0.003$ . In particular, the results of a post-hoc comparison with Bonferroni's correction, show that messages in the casual conversation community express less ingroup salience ( $M = 0.43, SD = 1.75$ ) than the conspiracy ( $M = 0.64, SD = 2.29, p < .001, d = 0.10$ ), the politics ( $M = 0.79, SD = 2.44, p < .001, d = 0.15$ ), and the skeptic ( $M = 0.64, SD = 2.04, p < .001, d = .17$ ) communities. Moreover, the conspiracy community did not significantly differ from the skeptic community ( $p = 1, d = 0$ ), but it expressed less ingroup salience than the politics community ( $p < .001, d = 0.06$ ).

### ***Outgroup salience***

The results of an ANOVA with “They” scores as dependent variable and subreddits as predictors show that the use of the third person plural within texts was significantly different across communities  $F(3,142562) = 276.96, p < .001, \eta = 0.006$ . In particular, the results of a post-hoc comparison with Bonferroni’s correction, show that messages in the casual conversation community express less outgroup salience ( $M = 0.91, SD = 2.56$ ) than the conspiracy ( $M = 1.29, SD = 3.18, p < .001, d = 0.13$ ), the politics ( $M = 1.64, SD = 3.58, p < .001, d = 0.22$ ), and the skeptic ( $M = 1.27, SD = 2.97, p < .001, d = .13$ ) communities. Moreover, the conspiracy community did not significantly differ from the skeptic community ( $p = 1, d = 0.01$ ), but it expressed less outgroup salience than the politics community ( $p < .001, d = 0.10$ ).

### ***Affiliation***

The results of an ANOVA with the affiliation scores as dependent variable and subreddits as predictors show that the expression of affiliation-related words within texts was significantly different across communities  $F(3,142562) = 190.37, p < .001, \eta = 0.004$ . In particular, the results of a post-hoc comparison with Bonferroni’s correction, show that messages in the casual conversation community express more affiliation ( $M = 2.10, SD = 4.53$ ) than the conspiracy ( $M = 1.45, SD = 3.79, p < .001, d = 0.16$ ), the politics ( $M = 1.66, SD = 3.57, p < .001, d = 0.12$ ), and the skeptic ( $M = 1.27, SD = 3.02, p < .001, d = .22$ ) communities. Moreover, the conspiracy community expressed more affiliation than the skeptic community ( $p = .001, d = 0.05$ ), but it expressed less affiliation than the politics community ( $p < .001, d = 0.06$ ).

## Discussion

Overall, the results show a pattern in which messages in the conspiracy community are consistently different from messages coming from a general conversation community in the expression of the psychological processes here taken into account. Specifically, compared to the casual conversations group, messages from the conspiracy community expressed less positive emotions, more negative emotions, more intergroup salience, more power, more epistemic orientation, and less affiliation. Conspiracy beliefs are based on intuitive and emotive reasoning, but in particular with negative emotions like anxiety and fear. Coherently, only negative emotions are more expressed in the conspiracy community. The results related to the intergroup salience are coherent with previous research about conspiracy beliefs. Indeed, conspiracy beliefs are prompted when intergroup conflict is more salient (Mashuri & Zaduqisti, 2015). More complex is the interpretation of the results related to empowerment and affiliation. People believing in conspiracy theories are generally more marginalized, with a stronger feeling of powerlessness, and with stronger epistemic and social needs (Douglas et al., 2017b). While it is unclear whether their discourses should mirror rather than compensate for these psychological characteristics, the results of this study emerge that the conspiracy community expresses more power, and epistemic-related words but less affiliation than the general conversation community.

This study also highlights an interesting comparison between the conspiracy community and two other types of ideological communities: the politics and the skeptic communities. While the politics community seems to emphasize all psychological processes related to conspiracy beliefs, as it has a stronger expression of negative emotions, intergroup salience, and empowerment, the skeptic community appears very similar to the conspiracy community in terms of psycholinguistic features. Indeed, the conspiracy and the skeptic community do not reliably differ in terms of negative emotional expression and intergroup salience, even with the

high-powered large sample used for this study. In fact, with large samples, even small effects are statistically significant. In general, the effect sizes found in this study are small, but they are in line with other studies using similar methodologies (Fong et al., 2021). This study has important implications for the study of conspiracy beliefs. Indeed, while it corroborates previous research related to the features of conspiracy beliefs (van Prooijen & Douglas, 2018), it opens new questions about how much such features are specific to conspiracy thinking or they can be assimilated to a more general form of motivated-ideological thinking. Future studies are required to achieve a more in-depth comparison not only between conspiracy and non-conspiracy beliefs but also across different sets of ideological beliefs.

## **Study 12. The Virality of conspiracy theories<sup>9</sup>**

In the previous studies, we investigated, using different methodologies and different online environments, which are the characteristics of conspiracy theories. In Study 9, We found that conspiracy rhetoric is often used in fake news articles, which are articles that intentionally try to deceive online users. In Study 10, we found that, in the context of political leaders' communication, conspiracy rhetoric is strictly associated with populist rhetoric and messages' popularity. In Study 11, we found that conspiracy online community messages, at least in comparison with general conversations community messages, reflect the basic principles of conspiracy beliefs. However, all these studies share a correlational design, which prevents us from making causal inferences. Moreover, conspiracy beliefs are not just the result of communication processes, but also people have different tendencies in believing conspiracy theories (Brotherton et al., 2013). For this reason, in Study 12, I experimentally tested whether the use of conspiracy rhetoric is able to increase the popularity of online messages. Moreover, I took into account participants' conspiracy ideation. In particular, I expect that attitudes toward the messages will be more positive in messages characterized by conspiratorial rhetoric (H1). Moreover, I hypothesized that the intention to share the message will be higher when conspiratorial rhetoric is used within the message (H2). Similarly, I expect that the intention to comment on the messages will be higher differ based on the presence of when conspiratorial rhetoric is used within the message (H3). Finally, I expect that conspiratorial ideation will moderate the effect of conspiratorial rhetoric on attitudes toward the messages, and on the intention to share and to comment on the messages (H4).

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<sup>9</sup> I want to thank Arculeo Giorgia, Boscarior Riccardo, Galeotti Tommaso, and Rebbah Hanaa for their precious help.

## Method

### Participants

151 participants (115 females, 34 males, and 4 non-binaries,  $M_{age} = 28.34$ ,  $SD_{age} = 11.25$ ) took part in the experiment. Participants were recruited from social media (e.g., Facebook, Instagram). Number of participants was determined by time considerations: the aim was to collect as many participants as possible within three weeks. As this study was conducted in the context of an educational laboratory, no institutional ethical approval was asked for this study due to time limits considerations.

### Procedure

The experiment was conducted online. After participants gave their consent to participate, they had to read 4 messages related to information transparency, the popularity of Greta Thunberg, the use of public funds for the earthquakes victims, and scientific development. Each message was written in order to contain or not a conspiratorial claim (e.g., “Powerful groups manipulate information in order to reach their shady purposes.”), and each participant read 2 messages containing the conspiratorial claim and 2 messages not containing it. Moreover, in order to improve the realism of the procedure, messages were written in order to look like actual Facebook posts (see Figure 19).

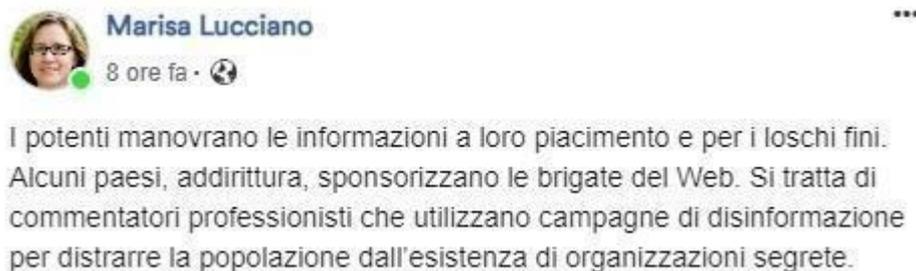


Figure 19. Example of conspiratorial Facebook post stimuli.

Each participant had to evaluate 4 different messages, two were non-conspiratorial and two were conspiratorial. For each message, participants had to indicate their attitude toward the message, their intention to comment and share the message. After this, participants were asked to answer items related to conspiracy mentality, political orientation, and to provide some socio-demographic information.

## **Measures**

### **Attitude toward messages**

Three items on a 7-points Likert scale were used to assess the attitude toward messages (“My impression toward this message is positive”, “This message is credible”, “This message is informative”;  $\alpha = .91$ ).

### **Intention to comment**

One item on a 7-points Likert scale was used to assess participants’ intention to comment on the proposed messages (“Would you comment on this message?”; 1 = I would negatively comment on this message, 4 = I would not comment on this message, 7 = I would positively comment on this message). As the goal of this study was to assess the intention independently from the valence of the comment, I recoded the measure (1 = I would definitely not comment on this message, 4 = I would definitely comment on this message).

### **Intention to share the message**

One item on a 7-points Likert scale was used to assess participants’ intention to comment on the proposed messages (“I would share this message”).

### **Conspiracy mentality**

A 12-items version of the General Conspiracist Beliefs Scale (Brotherton & French, 2014) were used to assess conspiracy mentality ( $\alpha = .94$ )

## Political orientation and socio-demographic information

Political orientation was assessed with a slider ranging from 0 (extreme left) to 100 (extreme right). Finally, participants gave information about their gender, age, and education.

## Results

### Attitude toward messages

I run mixed-effects linear regression model with attitude toward messages as the dependent variable, conspiracy rhetoric, and conspiracy mentality, their interaction as fixed effects, and with participants and message as random effects on the intercepts. The results showed a negative statistically significant effect of conspiracy rhetoric ( $\beta = -.39$ ,  $SE = .15$ ,  $p = .02$ ), and a positive statistically effect of conspiracy mentality ( $\beta = .20$ ,  $SE = .03$ ,  $p < .001$ ) on the attitude toward the messages. Moreover, I found a significant interaction between conspiracy rhetoric and conspiracy mentality ( $\beta = .22$ ,  $SE = .05$ ,  $p < .001$ ; see Figure 20). The marginal  $R^2$  of the model was .12, and the conditional  $R^2$  of the model was .57.

The results of a single slopes analysis revealed that the association between conspiracy mentality and positive attitudes toward the messages was weak when the message did not use conspiratorial rhetoric ( $\beta = .25$ ,  $p < .001$ ), and medium when the message used conspiratorial rhetoric ( $\beta = .45$ ,  $p < .001$ ).

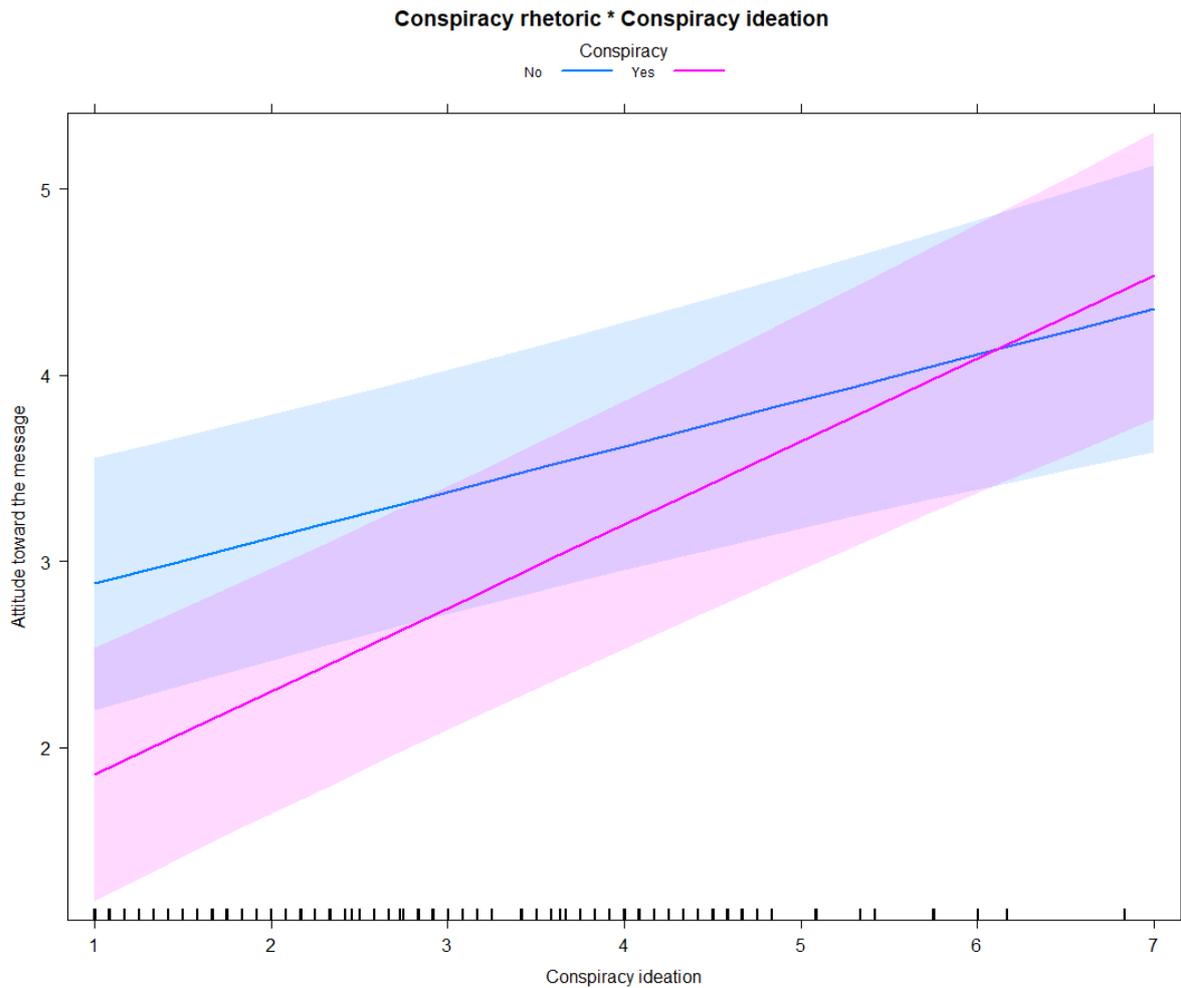


Figure 20. Conspiracy ideation \* Conspiracy rhetoric effects plot on Attitude toward the message.

### Intention to comment

The results of a mixed-effects linear regression model with Intention to comment as the dependent variable, Conspiracy rhetoric, and Conspiracy mentality their interaction as fixed effects, and with participants and message as random effects on the intercepts, did not show any statistically significant effect (all  $\beta$ s > .12, all  $p$ s > .05). In particular, intention to comment was low for conspiratorial (M = 1.58, SD = 0.90) and non-conspiratorial (M = 1.56, SD = 0.84) messages. The marginal  $R^2$  of the model was .02, and the conditional  $R^2$  of the model was .49.

## **Intention to share**

The results of a mixed-effects linear regression models with intention to share as the dependent variable, conspiracy rhetoric, and conspiracy mentality their interaction as fixed effects, and with participants and message as random effects on the intercepts, showed a negative statistically significant effect of conspiracy rhetoric ( $\beta = -.24, SE = .12, p = .049$ ), and a positive statistically effect of conspiracy mentality ( $\beta = .21, SE = .05, p < .001$ ) on the attitude toward the messages. Moreover, I found a significant interaction between conspiracy rhetoric and conspiracy mentality ( $\beta = .11, SE = .05, p = .04$ , see Figure 21). The marginal  $R^2$  of the model was .09, and the conditional  $R^2$  of the model was .54. The results of a single slopes analysis revealed that the association between conspiracy mentality and positive attitudes toward the messages was weak when the message did not use conspiratorial rhetoric ( $\beta = .25, p < .001$ ), and medium when the message used conspiratorial rhetoric ( $\beta = .35, p < .001$ ).

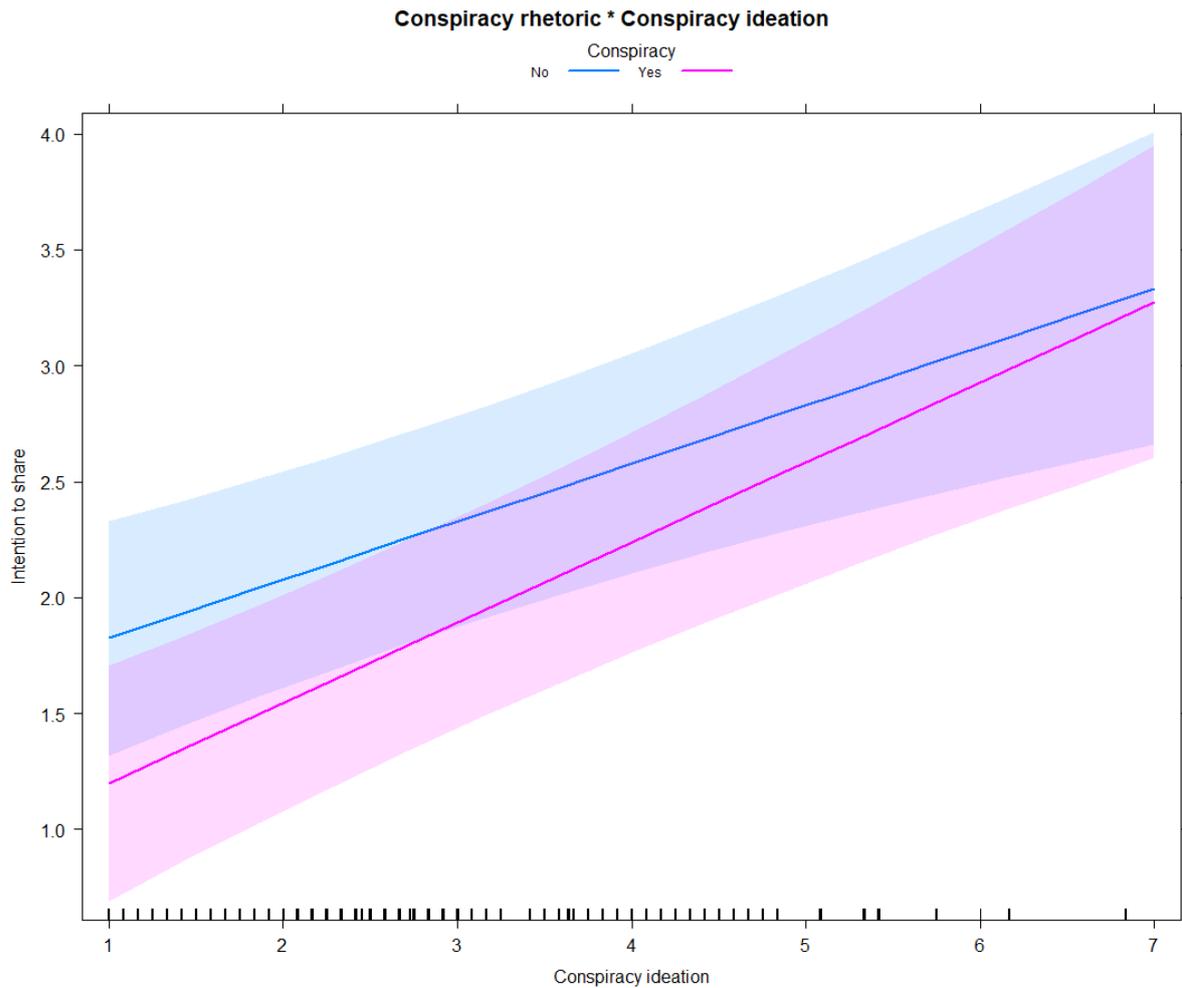


Figure 21. Conspiracy ideation \* Conspiracy rhetoric effects plot on Intention to share the message.

## Discussion

From these results, it emerges that the use of conspiratorial rhetoric is actually detrimental to message popularity. This result is in contrast with what we found in Study 10, where the presence of conspiracy rhetoric was positively associated with the popularity of messages. This study provides important insight related to the interaction between online content and psychological individual features. In fact, people with higher conspiracy ideation had more positive attitudes toward the messages, and a stronger intention to comment and to share the messages. The use of conspiracy rhetoric seemed particularly detrimental for participants holding lower conspiracy ideation. Based on these findings, it is possible that in

the online context, the use of conspiracy rhetoric polarizes the users, with people with low conspiracy mentality avoiding conspiratorial contents, whereas these contents keep engaged users with higher conspiracy ideation. These users can be beneficial for promoting the messages as they are more prone to comment and share online content.

Interestingly, according to these results, people with a stronger tendency in believing conspiracy theories were similarly oriented to be engaged in both conspiratorial and non-conspiratorial content. It is possible that specific situations and events may prompt the need to engage in online conversation and drive people with conspiracy ideation to channel characterized by conspiratorial rhetoric and contents, indeed -according to Samory & Mitra (2018)- conspiracy theories online communities flourish after dramatic social events. For this reason, in the next chapter, I investigate how conspiracy beliefs can be triggered by the perception of specific socio-structural characteristics of the environment, such as economic inequality and the perception of anomie, and how these characteristics interact with the individual tendency to believe in conspiracy theories.

## Conclusions

In this dissertation, I first tried to understand how the interaction between environmental cues and individual characteristics may increase the likelihood to believe in conspiracy beliefs. Drawing from the results of Studies 1a, 1b, 1c, 2, 3a, 3b, 4a, 4b, and 5 we can conclude that conspiracy beliefs can indeed be triggered by the perception of environmental cues that, through the increasing of anomie, frustrate important psychological needs. Moreover, individual preference plays an important role on the impact of such perceptions on conspiracy beliefs. Indeed, socio-structural cues lead to conspiracy beliefs in particular when they already have a conspiracy worldview. Finally, the role that individuals have in society is relevant: people that perceived themselves as member of lower class are more likely to believe in conspiracies.

Finally, I was interested in understanding which are the consequences of conspiracy beliefs. As conspiracy theories are common and present in different contexts (including Italy, Australia, USA, Poland, Germany as we can see in Studies from 3a, 3b, 4a, 4b, and 8b) and they can refer to very different topics (including COVID-19, politicians, scientists, multinational companies), it was plausible that they also have several different specific behavioral responses (including support for collective actions, support for progressive taxation, lack of compliance for tax and vaccination as in study 6, 7, 8a, and 8b), but yet these responses can be based on similar common psychological processes. In particular, here I proposed that conspiracy beliefs prompt tribal bias, which leads to behavioral responses that are aimed to damaged outgroup members, and to evaluate information based on the source of messages.

As conspiracy beliefs are complex phenomena, it was necessary to analyze the content of conspiracy theories and how they are shared on the Internet. As Internet communication has many different shapes, Studies 9, 10, and 11, focuses on different aspects of online

communication (i.e., fake news, social media political communication, and online communities' conversations). However, studying the messages is not sufficient because, as suggested by Study 12, people are not just passive receivers of information, but they are guided by natural tendencies, needs, and expectations. Indeed, nobody is isolated from its contexts, and different contexts and environmental cues can interact with personal features.

### **Main insights**

While these studies tackled a vast range of aspects related to conspiracy beliefs, it is clear that the complexity of these phenomena require further research in order to achieve a complete understanding of what cause conspiracy beliefs, and to which consequences they lead. However, overall, these studies contribute to draw some important insights about conspiracy beliefs and about future direction for the research on conspiracy beliefs.

**Generality vs. Specificity.** Research related to conspiracy beliefs have to take into account both facets related to a more general aspect of conspiracy thinking and the specificities of different conspiracy beliefs that can be rooted in the content of conspiracy theories. Indeed, conspiracy theories can be related to very different topics (e.g., health, economic inequality), and even when they are related to the same topic, they can also express opposite concepts (e.g., COVID-19 is a bioweapon and a hoax). However, all conspiracy theories share the same semantic structure: they all refer to malevolent plans orchestrated by groups secretly coordinated. Both environmental and individual antecedents can differently and interactively contribute to a more general conspiracy attitude and to the application of this attitude to specific instances. Indeed, environmental cues can favor a psychological climate in which conspiracy theories become more attractive, and thus facilitate the endorsement of a vast range of conspiracy. For example, as seen in Chapter 2, economic inequality was related to several different conspiracy beliefs both at the country level and individual levels. However, the perception of economic inequality was specifically relevant to improve the endorsement of

conspiracy beliefs related to the relevant environment context, such as the proposed fictional scenarios and was not generalized to other contexts. Congruently, in Study 4a and 4b, the manipulation of economic inequality did not affect participants' conspiracy worldview. Conspiracy worldview appears as a more stable individual feature that may facilitate the endorsement of conspiracy beliefs in specific situations, and it is related to a more general preference for conspiracy beliefs. On the flip side, it is due to mention that individual features can contribute also to the endorsement of specific conspiracy theories. For example, people with specific political preferences may be more attracted to conspiracy theories expressed by politicians with a similar vision, or to conspiracy theories that are coherent with previous opinions (Heider, 1958). The general vs. specific dimension of conspiracy beliefs is expressed also in their consequences. Indeed, at the specific and contextual level, different behavioral responses, like engaging in collective actions or boycotting specific scientific guidelines can be driven by the content of specific conspiracy beliefs. Differently, from the general dimension of conspiracy beliefs attain more general psychological consequences: the belief in conspiracy theories prompts ingroup favoritism and outgroup derogation. . Taking into account this dimension can help to have a better understanding of why people endorse conspiracy beliefs and what kind of actions we can expects. This understanding can provide relevant insights related to when it is important to act in order to contrast conspiracy narratives, whether they can represent an indicator of the fact that important citizens' psychological needs are being neglected or that discourses around important topics can be vulnerable to tribal biases. Moreover, the efficacy of actions aimed at reducing conspiracy beliefs may be linked to this General vs. Specific dimension. While some guidelines that proposed to focus on people wellbeing (Cichocka, 2020) may be particularly related in reducing general conspiracy beliefs, debunking strategies (Jolley & Douglas, 2017) appear more coherent as an approach aimed at reducing the belief in specific conspiracy theories

**Outcomes positivity vs. negativity.** While many governments and institutions are worried about the blowout of conspiracy theories and are trying to reduce their spreading, conspiracy theories are not necessarily false. However, there are some important elements that can suggest why conspiracy beliefs can often be harmful. Indeed, I found that conspiracy theories are widely used on fake news, which is a type of content that is intentionally produced to deceive the receivers. Thus, even if theoretically there is not an association between conspiracy theories and their veracity, pragmatically there is. Moreover, as conspiracy beliefs may lead to tribal bias, this mean that people believing in conspiracy theories can base their attitudes, opinion, and decisions on emotional and group-identity cues rather than on analytical investigations of the available information. This is not per se a negative outcome, because social influence can provide useful information and can prompt positive behaviors, such as acting for social change. As it can be seen in Study 6, 7, 8a, and 8b, conspiracy beliefs are indeed associated with outcomes that can clearly be considered as negative, for example vaccine hesitancy, but also to outcomes that can be useful for society, for examples collective actions aimed to contrast economic inequality and support for progressive taxation.

However, it can be particularly harmful when conspiracy theories are used in informational context characterized by intentionally false information and propaganda. As conspiracy beliefs are not false per se, the focus should be on providing environment where the veracity of information is easy to check, and other forms of affiliation and community building are proposed to people that can be particularly vulnerable to deceptions.

**Psychological needs and needs satisfaction.** Previous research suggested that conspiracy beliefs are based on important psychological needs, namely epistemic, existential, and social needs (Douglas et al., 2017). As we can see in Studies 11 and 12 These dimensions appear relevant also in the communication of conspiracy theories and in how people with strong conspiracy ideation behave online. Indeed, the theme of causality, power, and groups salience,

seem to be particularly prominent in the language used in conspiracy-related online communities vs. online communities without specific topics. Moreover, people with a stronger tendency to believe in conspiracies have a greater intention to engage in online contents, both by sharing and commenting online messages. It is possible that these behaviors are expressions of their needs: spreading information is a way to cope with epistemic needs, while the intention to comment can be a way to interact with other people and feel as part of a community. The relevance of psychological needs in conspiracy thinking is suggested also by the relationship between conspiracy beliefs and anomie. Indeed, anomie is the perception of society as characterized by deregulation and lack of common values, illegitimate leaderships, and disruption of social fabric. Psychological needs represent coherent psychological responses of such perception. However, it is unclear whether conspiracy beliefs can satisfy such needs. While conspiracy beliefs are associated to intentions to actions that can help to satisfy these needs, such as the intention to be more engaged in online contents and communities, the intention to participate in collective actions, it is possible that intentions are not followed by behaviors capable to satisfy psychological needs. However, more research is required to directly test whether conspiracy beliefs actually lead to the satisfaction of psychological needs.

### **Limits and future directions**

The present research project highlighted important insights related to the topic of conspiracy beliefs. However, it is important to notice some important limitations. First of all, a robust finding provided by this research project is that economic inequality causes conspiracy beliefs, and that this relationship is mediated by anomie and moderated by conspiracy worldview. I based the hypothesis of the link between economic inequality and conspiracy beliefs on the ideas that conspiracy beliefs emerge because of frustrated psychological needs, which are in turn frustrated by environmental cues. While the results are coherent with this line of

reasoning, other research focusing on other specific situations represents a required step to conceptually replicate my results and improve the generalizability of my findings. Moreover, it is important to highlight that psychological needs can be addressed with other types of beliefs. Indeed, a conspiracy worldview moderated the effect of the economic inequality manipulation. However, this moderation effect is just a first step in the understanding of individual preferences toward conspiracy beliefs, and how these interact with environmental cues. Relevant gaps are represented by how people developed a conspiracy worldview and how different perceptions of environmental cues can lead to endorse different types of belief. Moreover, in this dissertation, I proposed that a general outcome of conspiracy beliefs is the increase of tribalism. While I provide some evidence to support this claim, this line of research is at its preliminary phase. In fact, while I tested this assumption in different contexts (Studies 10 and 11 entailed economic inequalities, Studies 12a, and 12b are related to COVID-19 vaccination intention), all the provided evidence was correlational. Additional research is required in order to test whether and how the increase of conspiracy beliefs leads to increased tribalism. Confirming this link can help in building a general theory of the consequences of conspiracy beliefs, providing a framework able to predict several specific behavioral responses to conspiracy beliefs. Finally, concerning how conspiracy narratives are spread online and their impact on online users, it is due to the attention that the relationship between the use of conspiratorial rhetoric and messages' popularity is not clear. While I found an association between the use of such rhetoric and messages' popularity on Twitter in Study 10, this relationship was not confirmed in the experimental Study 12. These different findings can be due also by the different methodologies and in particular by the different samples' characteristics. Study 10 was based on information retrieved on Twitter, and it focus on messages spread by Italian political leaders. Political leaders have many opportunities to attract followers over time and political followers generally share common psychological characteristics. Differently, Study 4 was an experiment with a smaller sample composed

mostly by highly-educated university students. As we can see in Study 12 and coherently with Samory and Mitra (2018) people with higher conspiracy ideation had greater intention to participate in online activism. It is possible that conspiracy rhetoric, rather than improving the popularity of single messages, represents a signal that attracts internet users with similar opinions. In this way, people who use conspiratorial propaganda have the opportunity to build communities characterized by highly engaged members. Another possible interpretation is that conspiracy rhetoric actually does not improve messages' popularity, but when conspiracy rhetoric is used other persuasion tools are also at play. For example conspiracy theories are often spread in contexts where False balance is used (Dixon & Clarke, 2013; Grant et al., 2015), and false balanced messages can increase conspiracy beliefs (Salvador Casara et al., 2019). Moreover, people supporting and spreading conspiracy theories are more likely to focus their communication on appearing rational and open-minded (Wood & Douglas, 2013). Given the speculative nature of such interpretations, further research is required in order to directly test if, how and when conspiracy rhetoric represents an effective tool for propaganda.

### **Final words about methodologies**

In order to conduct these studies, I took advantage of a wide range of research methodologies. In particular, in Chapter 2 I designed cross-sectional studies which involved both country-level data coming from public datasets (Studies 1a, 1b, 1c), and individual-level data (Studies 2, 8a, 8b). Finally, experiments represented a focal part of this dissertation (Studies 3a, 3b, 4a, 4b, 5, 6, 7, 12), with many studies conducted to preliminary explore potential effects with smaller samples, and then follow-up replication with bigger samples. Moreover, Chapter 4 was characterized by the application of different approaches and techniques to text analyses. In Study 9, I was interested in the semantic content of a dataset characterized by a relatively large number of documents with long texts. Thus, I took advantage of topic modelling analytic strategy (Roberts et al., 2019), which allows me to extract relevant topics within the corpus of

documents and take a picture of the prevalence of such topics. In Study 10, I was interested in attributing a scores to specific communication and psychological dimensions of the messages. While the number of messages was higher than in Study 9, these messages were very short because of the character limits implemented by Twitter (i.e., 280 characters). Thus, for the analysis of this dataset, I relied on manual data coding, which is proven to be one of the most reliable strategies to deal with textual data (Drieger, 2013). In Study 11, I had clear psycholinguistic dimensions to test, therefore, for the data coding and the analyses of the study, I used a dictionary-based approach with the LIWC (Pennebaker et al., 2015). Specifically, the software allowed me to assign specific scores to the dimensions I was interested in.

Overall, the use of different methodologies was crucial to consider complex phenomena of conspiracy beliefs from a wide range of perspectives. The use of large multinational correlational samples, and country-level data was fundamental in order to provide ecological validity, which is particularly relevant for the study of conspiracy beliefs, due to its close relation with public policies and interventions. Experimental studies were fundamental in order to confirm the directionality of the hypothesized effects and to observe effects in more controlled contexts. Taking into account the importance of replications and pre-registrations was necessary in order to tackle the Replication Crisis that is affecting Social Psychology and provide robust results.

Finally, textual analyses represent the privileged way to understand what the actual semantic content and the linguistic framing of conspiracy theories as the communicative product is.

These studies provide a complex picture of the phenomenon of conspiracy beliefs. Personally, when I started this Ph. D. I saw myself as a person with very few “strong opinions”, but I have to say that my negative opinion toward conspiracy believers was quite an exception. I believe that these years were illuminating in understanding that even when you believe that the World

is rarely black or white, it can still be grayer than expected. However, it is still important to understand how light or dark shades of grey can be!

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## **Appendix 1**

### **Conspiracy beliefs scale (adapted from Brotherton et al., 2013, Study 3a and 3b)**

We would like to ask you to indicate to what extent you agree or disagree with the following statements about Bimboolean society.

1. I think that the official version of the events given by Bimboolean authorities very often hides the truth;
2. The Bimboolean government uses people as patsies to hide its involvement in criminal activities.
3. A lot of information is deliberately concealed from the Bimboolean public out of self-interest.
4. A lot of things get covered up here in Bimboola.
5. Our Lord Mayor pretends to represent us, but in reality he works for the wealthy 'big end of town'.
6. There is no real competition in Bimboola: Some businesses get all the government contracts.
7. We, ordinary Bimboolean citizens, are being kept in the dark, and distracted with 'bread and games'.
8. I have a strong suspicion that a secret society is running Bimboola from behind the scenes.
9. New and advanced technology which would hurt current industry is being suppressed.
10. Groups of scientists manipulate, fabricate, and suppress evidence in order to deceive the public.
11. The power held by the heads of state is second to that of small, unknown groups who really control world politics.
12. Experiments involving new drugs or technologies are routinely carried out on the Bimboolean public without their knowledge or consent.
13. Certain significant events have been the result of the activity of a small group who secretly manipulate world events.
14. The spread of certain viruses and/or diseases is the result of deliberate, concealed efforts of some organizations.
15. Technology with mind-control capacities is being used on Bimboolean people without their knowledge.
16. A small secret group of people is responsible for making all major world decisions, such as going to war.

### **Situational collective actions intention (Study 4b)**

1. To improve Kalo's society, citizens should protest to make compulsory schooling last longer.
2. To make it a better society, Kalo's citizens should engage in collective protests calling for a reduction in the duration of compulsory schooling/training so students can be free to stop their education whenever they want.
3. In order to improve Kalo's society, citizens should protest for the implementation of a salaries cap for business owners and managers.

4. To improve the society of Kalo, citizens should protest for the implementation of a minimum wage.
5. To improve the society of Kalo, I would organize a charity fundraiser.
6. To improve the society of Kalo, I would participate to a charity fundraiser.
7. To make Kalo a better society, I would engage in collective protests asking for weaker government regulation of the economy.
8. To make Kalo a better society, I would engage in collective protests asking for stronger government regulation of the economy.
9. To improve the society of Kalo, I would advocate for higher taxation to enable the Government to implement better social welfare policies.
10. To improve Kalo's society I would advocate for lower taxation to enable citizens to be more free to use their money to purchase the services they need.

## Appendix 2

**Manipulation.** Below, I report the economic manipulation used in Study 4a, 4b, and 5

### High Inequality

**Dear participant, we are asking you to imagine your life in the society described below**

**Kalo** is a western society with **high levels of economic inequality**.

The economy of Kalo is characterized by the presence of **few big multinational companies**, which use almost all of the Kalo's labor force and are the main providers of almost all goods and services, whereas **small and medium companies** are almost absent **and have a negligible impact** on Kalo's economy. The Public intervention is **very light** and the tax rates are **flat**. The companies' owners have wages **thousands of times** bigger than those their workers  
Managers have wages **hundreds of times** bigger that those of their workers.

**The 50% of Kalo's wealth is hold by the 3% of its citizens.**

### Low Inequality

**Dear participant, we are asking you to imagine your life in the society described below**

**Kalo** is a western society with **low levels of economic inequality**.

The economy of Kalo is characterized by the presence of **several small and medium companies**, which use almost all of the Kalo's labor force and are the main providers of almost all goods and services, whereas **big multinational companies** are almost absent **and have a negligible impact** on Kalo's economy. The Public intervention is **very heavy** and the tax rates are **progressive**.

The companies' owners have wages **five times** bigger than those their workers  
Managers have wages **three times** bigger that those of their workers.

**The 50% of Kalo's wealth is hold by the 30% of its citizens.**

## Appendix 3: Correlation matrices

### Study 2

#### Pearson's Correlations

Variable	1	2	3	4	5	6	7	8	9	10
1. Consp beliefs	—									
2. anomie	0.356 ***	—								
3. sub_gini	0.146 ***	0.296 ***	—							
4. pol1	0.108 *	-0.038	-0.094 *	—						
5. pol2	0.058	-0.064	-0.085	0.567 ***	—					
6. gender	0.081	0.098 *	0.140 **	-0.083	-0.088 *	—				
7. education	-0.097 *	-0.083	-0.133 **	0.044	0.050	-0.110 *	—			
8. income1	-0.173 ***	-0.221 ***	-0.146 ***	0.151 ***	0.078	-0.308 ***	0.386 ***	—		
9. income2	-0.200 ***	-0.217 ***	-0.145 **	0.122 **	0.037	-0.181 ***	0.288 ***	0.698 ***	—	
10. age	0.022	0.087 *	0.026	-0.020	0.009	-0.034	-0.085	-0.122 **	-0.231 ***	—

\* p < .05, \*\* p < .01, \*\*\* p < .001

### Study 3a

#### Pearson's Correlations

Variable	1	2	3	4
1. consp beliefs	—			
2. anomie	0.508 ***	—		
3. perception inequality	0.245 *	0.448 ***	—	
4. perception equality	-0.351 ***	-0.583 ***	-0.490 ***	—

\* p < .05, \*\* p < .01, \*\*\* p < .001

### Study 3b

#### Pearson's Correlations

Variable	1	2	3	4
1. conspiracy_beliefs	—			
2. anomie	0.718 ***	—		
3. perceived_inequality	0.527 ***	0.748 ***	—	
4. perceived_equality	-0.538 ***	-0.753 ***	-0.908 ***	—

\* p < .05, \*\* p < .01, \*\*\* p < .001

### Study 4b and Study 6 Pearson Correlations

	1	2	3	4	5	6	7	8
1. Conspiracy beliefs	—							
2. Conspiracy worldview	0.225*	—						
3. Charity	0.044	0.136	—					
4. Welfare policies	0.454***	0.193	0.159	—				
5. Tax compliance	-0.126	-0.118	-0.085	0.071	—			
6. General coll action econom ineq	-0.088	0.341***	0.272**	0.383***	-0.074	—		
7. General coll action gender ineq	-0.064	0.141	0.269**	0.215*	-0.083	0.567***	—	
8. General coll action ill immigr	0.164	0.108	0.038	-0.022	-0.115	-0.077	-0.048	—

\* p < .05, \*\* p < .01, \*\*\* p < .001

### Study 5 and Study 7

#### Pearson's Correlations

Variable	1	2	3	4	5	6	7	8
1. Conspiracy beliefs	—							
2. Tax penalization	0.312***	—						
3. Tax compliance	-0.246***	-0.659***	—					
4. Support progressive taxation	0.090***	-0.065**	0.108***	—				
5. Education	-0.138***	-0.161***	0.090***	0.032	—			
6. Political orientation	0.066**	0.198***	-0.234***	-0.189***	-0.158***	—		
7. Subjective SES	-0.127***	-0.133***	0.124***	-0.036	0.216***	0.002	—	
8. Income	-0.177***	-0.184***	0.138***	-0.017	0.216***	-0.024	0.605***	—

\* p < .05, \*\* p < .01, \*\*\* p < .001

### Study 8a

#### Pearson's Correlations

Variable	1	2	3	4
1. Conspiracy beliefs	—			
2. Vaccine intention	-0.378***	—		
3. Trust in science	-0.441***	0.687***	—	
4. Perceived likelihood infection	-0.096**	0.252***	0.227***	—

\* p < .05, \*\* p < .01, \*\*\* p < .001

### Study 8b

#### Pearson's Correlations

Variable	1	2	3	4	5
1. Conspiracy beliefs	—				
2. Vaccine intention	-0.257***	—			
3. Trust in science	-0.353***	0.457***	—		
4. Perceived likelihood infection	0.049	0.214***	0.257***	—	
5. Perceived severity infection	-0.235***	0.364***	0.369***	0.268***	—

### Pearson's Correlations

Variable	1	2	3	4	5
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\* p < .05, \*\* p < .01, \*\*\* p < .001

### Study 10

#### Spearman's Correlations

Variable	1	2	3	4	5	6	7
1. Conspiracy Rethoric	—						
2. People-centrism	0.146 ***	—					
3. Social-exclusion	0.392 ***	0.210 ***	—				
4. Anti-elitism	0.455 ***	0.276 ***	0.336 ***	—			
5. Populism	0.393 ***	0.836 ***	0.470 ***	0.677 ***	—		
6. Favorite count	0.153 ***	0.237 ***	0.241 ***	0.137 ***	0.260 ***	—	
7. Retweet count	0.244 ***	0.235 ***	0.275 ***	0.286 ***	0.344 ***	0.584 ***	—

\* p < .05, \*\* p < .01, \*\*\* p < .001

### Study 11

#### Pearson Correlations

	1	2	3	4	5	6	7
1. Positive emotion	—						
2. Negative emotion	-0.070 ***	—					
3. Empowerment	0.037 ***	0.106 ***	—				
4. Epistemic answers	-0.058 ***	-0.054 ***	-0.025 ***	—			
5. We	-0.027 ***	-0.004	0.015 ***	0.004	—		
6. They	-0.048 ***	-0.001	0.012 ***	0.024 ***	-0.013 ***	—	
7. Affiliation	0.082 ***	-0.029 ***	0.014 ***	-0.039 ***	0.605 ***	-0.013 ***	—

\* p < .05, \*\* p < .01, \*\*\* p < .001