



Routledge Studies in Media, Communication, and Politics

KNOWLEDGE RESISTANCE IN HIGH-CHOICE INFORMATION ENVIRONMENTS

Edited by Jesper Strömbäck, Åsa Wikforss,
Kathrin Glüer, Torun Lindholm and Henrik Oscarsson



Knowledge Resistance in High-Choice Information Environments

This book offers a truly interdisciplinary exploration of our patterns of engagement with politics, news, and information in current high-choice information environments. Putting forth the notion that high-choice information environments may contribute to increasing misperceptions and knowledge resistance rather than greater public knowledge, the book offers insights into the processes that influence the supply of misinformation and factors influencing how and why people expose themselves to and process information that may support or contradict their beliefs and attitudes.

A team of authors from across a range of disciplines address the phenomena of knowledge resistance and its causes and consequences at the macro- as well as the micro-level. The chapters take a philosophical look at the notion of knowledge resistance, before moving on to discuss issues such as misinformation and fake news, psychological mechanisms such as motivated reasoning in processes of selective exposure and attention, how people respond to evidence and fact-checking, the role of political partisanship, political polarization over factual beliefs, and how knowledge resistance might be counteracted.

This book will have a broad appeal to scholars and students interested in knowledge resistance, primarily within philosophy, psychology, media and communication, and political science, as well as journalists and policymakers.

Jesper Strömbäck is Professor in Journalism and Political Communication at the Department of Journalism, Media and Communication, University of Gothenburg, Sweden. His research focuses on political communication, political news journalism and public opinion formation.

Åsa Wikforss is Professor of Theoretical Philosophy at Stockholm University, Sweden, and does research in the intersection of philosophy of mind, language, and epistemology.

Kathrin Glüer is Professor of Theoretical Philosophy at the Department of Philosophy, Stockholm University. Her research ranges from formal semantics to perception, and she has a longstanding interest in reasons and rationality.

Torun Lindholm is Professor in Psychology at the Department of Psychology, Stockholm University. Her research centers around cognitive and social psychological mechanisms involved in intergroup perception and judgments.

Henrik Oscarsson is Professor in Political Science and Research Director for the Swedish National Election Studies (SNES) at the Department of Political Science, University of Gothenburg. His research interests focus on public opinion and electoral behavior.



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About the Authors

Hajo G. Boomgaarden is Professor for Empirical Social Science Methods with a Focus on Text Analysis at the Department of Communication, and Dean of the Faculty of Social Sciences, University of Vienna, Austria. His research advances and applies computational methodology in communication science and primarily deals with various aspects of political communication and journalism, such as migration, election campaigns, political information processing, or knowledge and disinformation.

Elena Broda is a PhD student at the Department of Journalism, Media and Communication at the University of Gothenburg, Sweden. Her research focuses on political communication, in particular media effects on (political) knowledge, societal perceptions, and opinion formation.

Christopher F. Chabris is Professor at Geisinger, USA, and the Faculty Co-Director of the Behavioral Insights Team in the Steele Institute for Health Innovation, Geisinger. He is a Fellow of the Association for Psychological Science. His research focuses on attention, decision-making, intelligence, and behavior genetics. His work has been published in *Science*, *Nature*, *PNAS*, and *Perception*, among many other journals. Chris is also co-author of *The Invisible Gorilla: How Our Intuitions Deceive Us*, published in 20 languages.

Gabriela Czarnek is Assistant Professor at the Institute of Psychology, Jagiellonian University, Krakow, Poland, and a member of Centre for Social Cognitive Studies. Her research focuses on psychological roots of political beliefs as well as its consequences for beliefs and attitudes in other domains with an emphasis on science-related topics. In her research she uses surveys, lab experiments, psychophysiological measures, as well as big data techniques.

Alyt Damstra has a PhD in Communication Science from the University of Amsterdam, the Netherlands, and is Postdoctoral Researcher at the Amsterdam School of Communication Research. Her research agenda revolves around news effects on political processes and public opinion. She is currently involved in a research project on knowledge resistance and is member of the scientific staff of the Scientific Council of Government Policy in The Hague, the Netherlands.

Jana Laura Egelhofer is a Post-doctoral researcher in political communication at the Department of Communication, University of Vienna. Her research interests include fake news, disinformation, incivility and politicians' media criticism. Her work has been published in international journals such as *Annals of the International Communication Association*, *Journalism Studies*, and *Journal of Language and Politics*.

Kathrin Glüer is Professor of Theoretical Philosophy at the Department of Philosophy, Stockholm University, Sweden. She works mainly in the philosophy of mind and language. Her research ranges from formal semantics to perception, and she has a longstanding interest in reasons and rationality. She is a member of Academia Europaea and the Royal Swedish Academy of Sciences.

Michael Ingre has a PhD in psychology from the Department of Psychology, Stockholm University. His research interests center around metascience and knowledge resistance. He is also specialized in quantitative statistical analyses and has been involved as an analyst in several projects at the Karolinska Institute and Stockholm University.

Hannes Jarke is Research Associate at the Centre for Business Research at the University of Cambridge's Judge Business School, UK. His research primarily investigates how people make health-related decisions and how behavioural science can inform public health policy. He also serves as the Director of Operations for the Junior Researcher Programme, an initiative that creates opportunities for early career researchers in psychology.

Silvia Knobloch-Westerwick has a PhD from HMTM Hanover, Germany, and is Professor at the School of Communication at The Ohio State University, USA, and co-editor of *Communication Research*, a flagship journal of communication science. Her research examines the selection, processing, and effects of mediated communication. Her book publications include "*Mediated Communication & You: An Introduction to Internet and Media Effects*" (2020) and "*Choice and Preference in Media Use: Advances in Selective Exposure Theory and Research*" (2015).

Małgorzata Kossowska is Professor of Psychology, Head of the Social Psychology Unit and the Center for Social Cognitive Studies in the Institute of Psychology at the Jagiellonian University. Her areas of interest include the cognitive and motivational underpinnings of complex social phenomena (e.g., political ideology, prejudice, social inequality in cultural context), knowledge resistance, cognitive rigidity and its relationships with social problem solving and socio-political decision making. She is a previous member and chairwoman of the National Science Center, currently a member of the Covid-19 Advisory Team at the President of Polish Academy of Sciences.

Sophie Lecheler is Professor of Political Communication at the Department of Communication, University of Vienna. Her research focuses on digital political journalism, misinformation, emotions, and news effects. She has

published in a wide range of international journals, such as *Political Communication*, *Communication Research*, *Journal of Communication*, *New Media & Society*, *Journalism Studies*, and *Journal of Computer-Mediated Communication*.

Elina Lindgren holds a PhD in Political Science and works as Associate Researcher at the Department of Journalism, Media, and Communication at University of Gothenburg. Her main research interests are in political communication, public opinion, and survey designs.

Torun Lindholm is Professor in psychology at the Department of Psychology, Stockholm University. Her research centers around cognitive and social psychological mechanisms involved in intergroup perception and judgments. One of her most recent publications is *Us and Them; Language, Groups, and Prejudice* (2021). She is a member of the Royal Swedish Academy of Letters, History and Antiquities.

Michelle N. Meyer is Assistant Professor and Associate Director for Research Ethics at Geisinger, where in addition to conducting normative and policy research, she co-directs an interdisciplinary lab that investigates judgments and decision-making related to research, innovation, and healthcare. She is also the Faculty Co-Director of the Behavioral Insights Team in the Steele Institute for Health Innovation. She received her Ph.D. in Applied Ethics from the University of Virginia, USA, and her J.D. from Harvard Law School, USA.

Eliot Michaelson is Reader in Philosophy in the Department of Philosophy at King's College London, UK. Most of his research focuses on the philosophy of language, in particular on non-ideal approaches to meaning and communication, the nature of lying and deception, and the nature of fake news. Together with Jessica Pepp and Rachel Sterken, Michaelson is currently working on two related research projects, funded by the Norwegian Research Council and the Swedish Research council, focused on applying philosophy of language to, and drawing lessons for philosophy of language from, internet-based linguistic phenomena.

Henrik Oscarsson is Professor in Political Science and Research Director for the Swedish National Election Studies (SNES) at the Department of Political Science, University of Gothenburg, Sweden. His research interests focus on public opinion and electoral behavior.

Jessica Pepp is a Burman Fellow and Researcher in Theoretical Philosophy at Uppsala University, Sweden, Researcher at the University of Oslo, Norway, and Docent at the University of Turku, Finland. Her research interests are mainly in the philosophy of language and mind, with focuses on questions about linguistic reference, intentionality, and various forms of insincerity. She is PI of the Swedish Research Council project *New Frontiers of Speech: Philosophy of Language in the Information Age*.

Jason Reifler is Professor of Political Science at the University of Exeter, UK.

His research focuses broadly on public opinion and political psychology topics such as (a) the accuracy of factual beliefs about politics, science, and health and (b) public opinion about foreign policy. Recent work has been published in such journals as *Proceedings of the National Academy of Sciences*, *Nature Human Behaviour*, the *British Journal of Political Science*, and the *Journal of Communication*.

Nathaniel Rabb is a Researcher at The Policy Lab at Brown University, USA, where he studies COVID-19 beliefs, behaviors, and knowledge as part of the lab's work with the Rhode Island Department of Health. He has run research projects for Tufts University and Boston College in the USA, and the European Commission's Joint Research Centre, and has published in *PNAS*, *Cognition*, *Psychological Science*, *Trends in Cognitive Sciences* and *Behavioral Public Policy*.

Roderik Rekker is a political scientist and a psychologist. His research has focused primarily on stability and change in political attitudes across time, generations, and the lifespan. He currently examines generational differences in voting (University of Amsterdam, VENI-grant) and political polarization over facts and science (University of Gothenburg).

Henri C. Santos is a staff scientist in the Behavioral Insights Team at Geisinger's Steele Institute for Health Innovation, where he develops and studies healthcare interventions using principles from psychology and behavioral economics. Outside of this work, he also conducts psychological research on expertise, wise reasoning, and cultural change. He received his Ph.D. in Social Psychology from the University of Waterloo, Canada.

Daniel Schulte is a Ph.D. candidate in Comparative Politics and International Relations at Brown University. Schulte's research interests include policy, ethnicity, religious parties, democratization, and nationalism. His dissertation explores the causes of changes in morality policy in Turkey, Russia, and Poland, with analysis focusing on religious education, women's rights, and LGBTQI+ rights. Schulte's co-authored book chapter has appeared in *Faith-Based Organizations and Social Welfare* (2020).

Jacob Sohlberg is Associate Professor and Researcher at the Department of Political Science, University of Gothenburg. His research is rooted in political psychology, and he often focuses on issues concerning migration and the environment. His work has been published in journals such as *Comparative Political Studies*, *Environmental Politics*, *European Journal of Political Research* and *Journal of Ethnic and Migration Studies*.

Rachel Katharine Sterken is Associate Professor of Philosophy at the University of Hong Kong. Her research focuses on the semantics and pragmatics of generic language, conceptual engineering and conceptual ethics, and how fundamental aspects of meaning and communication have changed as a result of recent advances in information and communication technology and AI.

She is also principal investigator of the project *Meaning and Communication in the Information Age*, funded by the Norwegian Research Council (303201).

Jesper Strömbäck is Professor in Journalism and Political Communication at the Department of Journalism, Media and Communication, University of Gothenburg. His research focuses on political communication, political news journalism and public opinion formation. His most recent book is *Media and Public Attitudes Toward Migration in Europe: A Comparative Approach* (Routledge, 2021), co-edited with Christine E. Meltzer, Jakob-Moritz Eberl, Christian Schemer and Hajo Boomgaarden.

Daniel Sude is Postdoctoral Fellow in the Dan Department of Communication at Tel Aviv University, Israel. His research focuses on computer mediated political communication in high choice, high interactivity, online environments. Specific areas of focus include selective exposure to mass and social media, social identity and intragroup dynamics, communication affordances, and interpersonal dynamics in cross-cutting online political discussion.

Paula Szewach is Research Fellow at the University of Exeter and a PhD candidate at the University of Essex, UK. Her research lies in the intersection between political communication, political psychology, and computational social science. She focuses on online misinformation and misperceptions using survey data, experimental and computational methods.

Ewa Szumowska is Researcher at the Social Psychology Unit in the Institute of Psychology at Jagiellonian University in Krakow and a member of the *Center for Social Cognitive Studies Krakow* and the *European Association of Social Psychology*. She is an author and co-author of scientific publications in journals like *Psychological Review*, *Psychological Inquiry*, *Perspectives on Psychological Science*, *Cognition* or *Journal of Experimental Psychology*. She studies motivation, information processing, multiple goal pursuit, and extremism.

Paulina Szwed is a researcher working at the Social Psychology Unit in the Institute of Psychology at Jagiellonian University in Krakow, a member of the Center for Social Cognitive Studies Krakow and the International Society of Political Psychology. Her scientific interests are organized around motivated cognitive effort, especially in the context of cognitive dissonance reduction and dealing with uncertainty.

Yariv Tsfati received his Ph.D. from the Annenberg School for Communication at the University of Pennsylvania, USA, in 2001. His research focuses on various facets of public opinion, in particular on trust in media, the third person effect, and campaign effects. His research has been funded by the Israel Science Foundation, the Israeli Ministry of Science and Technology (MOST), the German-Israel Foundation, and other institutes. Tsfati currently serves as co-Editor-in-Chief of Human Communication Research.

Rens Vliegenthart is Full Professor of Media and Society at the Amsterdam School of Communication Research (ASCoR), University of Amsterdam. His research focuses on the analyses of media content and effects, both on citizens and public opinion, as well as on politicians and political decision making. His research is published in a wide range of journals in communication science, political science, and sociology.

Stavros Vourloumis is Research Fellow in Strategic Management and Decision-making at the Department of Business Administration, Athens University of Economics and Business, Greece, and holds a Ph.D. from the same department. His research focuses on behavioral and social forces that affect decision-makers within organizations and, in turn, organizational conduct and outcomes. His research has been presented at the Academy of Management, Strategic Management Society and European Academy of Management conferences.

Åsa Wikforss is Professor of Theoretical Philosophy at Stockholm University, and does research in the intersection of philosophy of mind, language, and epistemology. She is the author of two popular books, *Alternative facts* (2017) and *Why Democracy* (2021), where she discusses the threats to knowledge and the implications for democracy. She is a member of the Royal Academy of Science and the Swedish Academy.

Thomas J Wood is Assistant Professor of Political Science at Ohio State University, USA. He studies public opinion and political psychology. His work has been published in journals such as *American Journal of Political Science*, *Political Behavior*, *Public Opinion Quarterly* and *Political Communication*. He is also co-author of the book *Enchanted America. How Intuition and Reason Divide Our Politics* (2018).

Preface

It is commonly said that knowledge is power, and as scholars, we are naturally inclined to agree. At the same time, it is obvious that the linkage between knowledge and power is tenuous, at best. Power is wielded in many forms, and there is never any guarantee that those who exercise power make the best use of available knowledge. In democracies, it is also the case that power ultimately resides with the citizens, and among them, levels of knowledge vary significantly. While some are highly informed, others are uninformed, and in many cases, people are misinformed. In the latter case, simply providing correct information might not suffice, as people are inclined to prefer information that confirm their already held beliefs and values, and as many are strongly motivated to hold on to their misperceptions. This shapes not only what information people expose themselves to and pay attention to, but also how people process information. The end result might be knowledge resistance, which no one is immune to, and which influences everyone, regardless of position in society. In different ways, knowledge resistance thus affects all parts of society.

Understanding the nature of as well as causes and consequences of knowledge resistance is thus of utmost importance. Toward that end, we hope this book will prove to be helpful. While there is a growing body of research pertaining to knowledge resistance and related areas, thus far, most of this research is scattered across academic disciplines and published in specialized academic journals. In contrast, this book seeks to provide a broader and more integrative understanding of knowledge resistance in contemporary high-choice information environments, which crosses academic disciplines. Consequently, the book includes chapters written by scholars in philosophy as well as media and communication studies, psychology, and political science.

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Gothenburg and Stockholm, November 2021

*Jesper Strömbäck, Åsa Wikforss, Kathrin Glüer,
Torun Lindholm and Henrik Oscarsson*

1 Introduction

Toward Understanding Knowledge Resistance in High-Choice Information Environments

*Jesper Strömbäck, Åsa Wikforss, Kathrin Glüer,
Torun Lindholm and Henrik Oscarsson*

Introduction

While the usage of lies, distortions, and misrepresentations of facts for political purposes is nothing new, these phenomena have taken on increasing urgency over the last few years. The best example is probably the 2020 US presidential election, where Trump and his followers continue to claim that the election was stolen and that he rightfully had won. Both he and his followers, now including large parts of the Republican party, seem completely undeterred by the facts that Joe Biden won the electoral college votes with 306–232, that he won the popular vote with 6 million votes, that governmental experts who oversaw the election found that the 2020 election was “the most secure in American history” (Cybersecurity & Infrastructure Security Agency, 2020), and that the dubious legal challenges that were filed were thrown out by the courts.

These attempts to overturn the election results were unprecedented in the US history. Never before has an American president refused to accept the election results and failed to congratulate the winner. On the other hand, never before has an American president spread as many lies, falsehoods, and misleading claims during his tenure (Kessler et al., 2020).

At the same time, numerous opinion polls – both immediately after the election and afterwards – have shown that Trump’s repeated lies that the election was rigged and that he had won were successful in the sense that many believed and continue to believe him. For example, one opinion poll conducted two weeks after the election showed that a majority of Republicans thought that Trump “rightfully won”. Overall, only 55% said that they believed that the election had been “legitimate and accurate”, while 28% thought that the outcome was “the result of illegal voting or election rigging” (Kahn, 2020).

When traditional news media reported that Biden had won and Trump had lost, many directed their anger at the news media and sought refuge with political alternative right-wing media. Interestingly, before the election, Fox News was the most trusted and most used media among Republicans (Jurkowitz et al., 2020), but when Fox News stuck with the truth, many flocked to other right-wing media instead (Smith, 2020). Worth noting is that the claims from Trump

and his allies and the conspiratorial belief among Republicans that the election was rigged only pertained to the presidential election, not to the House and Senate elections that took place at the same time, and where Republicans were more successful.

While this might be an exceptional case, it illustrates several interrelated problems increasingly facing contemporary liberal democracies across the world. Among these are the prevalence of misinformation, disinformation and conspiracy theories; the complex role of news media, social media, and partisan-oriented media in processes of dealing with but also being the sources of and amplifying misinformation and disinformation; biased processing of information; factual belief polarization; the prevalence of misperceptions and belief in conspiracy theories; and ultimately *knowledge resistance*.

In this chapter, we will discuss each of these, and thereby set the stage for subsequent chapters. First, we will, however, discuss why knowledge resistance is a major problem that needs much more scholarly and societal attention than hitherto.

The Problem With Knowledge Resistance

Although the concept of knowledge resistance will be analyzed in greater depth and defined in [Chapter 2](#), it might be useful to shortly discuss it at the outset. Broadly speaking, knowledge resistance can be defined as the tendency to resist available evidence, and more specifically empirical evidence. Empirical evidence, of course, can come in many forms, but what is important is that empirical evidence pertains to how something actually is. In a narrow sense, knowledge resistance thus involves a form of irrational response to empirical evidence that is available to the individual. One key mechanism is motivated reasoning, where people – consciously but more often unconsciously – assess factual information not based on the empirical evidence and its truth value but rather to reach some other goals such as protecting one’s social identity (Kahan, 2016a, 2016b; Kunda, 1990). One example might be someone who resists scientific evidence that human activities are the main cause of global warming because such evidence conflicts with the political or social group that s/he identifies with.

If knowledge resistance in the narrow sense pertains to resistance toward evidence that is available to the individual, in a broader sense, it also pertains to cases where the subject’s reaction to the evidence is rational, given her prior beliefs, but where these prior beliefs in turn were acquired in an irrational way, perhaps as a result of misplaced trust. For instance, as a result of trusting hyperpartisan media, a person might acquire a conspiracy belief that makes her disbelieve the evidence that the 2020 election was fair. Another case is irrational avoidance or seeking out of information sources, where people selectively expose themselves to information and information sources that can be expected to confirm their attitudes and beliefs or avoid information and information sources that can be expected to challenge them. An example might be people that attend to scientific studies based on whether they can be expected to confirm or challenge their attitudes and beliefs, not based on the trustworthiness of the sources.

In other words, knowledge resistance in the wider sense involves resisting evidence that one easily could have but chose to avoid.

The problem with knowledge resistance is that it may lead to dire consequences at the individual as well as at the societal level, and that it poses a threat to democracy as such. Simply put, at all levels of analysis, knowledge is a fundamental prerequisite for individuals and groups if they are to be able to reach the desired ends. For example, if individuals want to stay healthy, they need to know what food to eat, what drinks to drink, and what precautions to take. Similarly, at the societal level, those with political and administrative power need to know, for example, which health-promoting policies work better than others and how to combat, for example, illness and communicable diseases. Resistance to knowledge might thus have disastrous consequences. For example, skepticism about and refusal to take vaccines has recently led to a resurgence of preventable diseases such as measles, rubella, mumps, and whooping cough (Kubin, 2019; Papachristanthou & Davis, 2019). One of the main reasons behind this skepticism and refusal is fear of adverse side effects, sometimes bolstered by conspiracy theories, for example, that vaccines may cause autism (Yaqub et al., 2014). Research shows that such fears are unfounded (Taylor et al., 2014), but still, many persist in their belief in adverse effects of vaccines. In the US, the result is that about 42,000 adults and 300 children are estimated to die each year from vaccine-preventable diseases (ODPHP, 2020). Similarly, research shows that skepticism toward established knowledge about HIV/AIDS is associated with lower condom use, which, in turn, increases the risk that people will be infected (Bogart et al., 2011; see also Ucinski, 2019). The effects of knowledge resistance might also be global. One example is how resistance toward established scientific knowledge about climate change has led important actors, such as the US under the Trump presidency, to weaken regulations aimed at reducing air pollution and emissions (Popovich et al., 2020). Public opinion surveys also show that a sizeable minority does not accept established knowledge that human activities are the main cause of global warming (Krosnick & MacInnis, 2020). In most countries, such skepticism toward scientifically established knowledge is more widespread among right-leaning citizens, reflecting an ideological divide (Funk & Kennedy, 2016; McCright et al., 2016; Oscarsson et al., 2021). As climate change severely affects the social and environmental determinants of health, it has been estimated to cause approximately 250,000 additional deaths every year between 2030 and 2050 (WHO, 2018).

In essence, then, knowledge resistance has profound effects on the individual as well as the societal level of analysis, preventing us all from reaching our desired ends. Important in that context is that no one is immune against the psychological processes that contribute to knowledge resistance. At the same time, no-one can fully escape reality. As succinctly noted by O'Connor and Weatherall (2019, p. 6), "If you believe in false things about the world, and you make decisions on the basis of those beliefs, then those decisions are unlikely to yield the outcome you expect and desire. The world pushes back".

Knowledge resistance also poses grave challenges for the functioning of democracy. Although scholars might argue about exactly how informed citizens

need to be (Dahl, 1998; Lupia, 2016; Popkin, 1994), for democracy to function well, citizens need to be at least reasonably informed about politics and society (Dahl, 1998; DelliCarpini & Keeter, 1996; Hochschild & Einstein, 2015; Rosenfeld, 2019; Wikforss, 2021). Otherwise, they will not be able to evaluate public policy, hold those in power accountable, or cast informed votes. Their voting behavior will also not reflect their actual preferences. Furthermore, since politicians respond to public opinion, as expressed in polls and elections, misinformed citizens might create incentives for politicians to cater to their misperceptions rather than correct them, and in such a process, politicians might willingly or unwillingly help to reinforce misperceptions. Numerous studies also show that misperceptions influence citizens' political attitudes and behavior. Among other things, research shows that overestimations of the size of the immigrant population are associated with anti-immigration attitudes (Gorodzeisky & Semyonov, 2020; Meltzer & Schemer, 2021), that misperceptions related to welfare spending are associated with support for welfare policies (Kuklinski et al., 2000), and that beliefs in false rumors about presidential candidates can affect voting behavior (Weeks & Garrett, 2014).

Knowledge resistance also undermines democratic processes by corrupting political discussions. For political discussions to be meaningful, not only do they need to be based on facts (DelliCarpini & Keeter, 1996; Hochschild & Einstein, 2015; McIntyre, 2018). There also needs to be a common set of true factual beliefs and – if there are factual disagreements – some generally accepted means of settling such disagreements (cf. Kavanagh & Rich, 2018; McIntyre, 2018). Simply put, the gulf between factual beliefs must not be too great. If or when politicians or others trade in misinformation or disregard established knowledge such as scientific evidence or official statistics, it becomes much more difficult to solve various disagreements between sides in a political conflict, increase knowledge and understanding, reach mutually acceptable decisions, and move the discussions forward (cf. Gutmann & Thompson, 1996; Kavanagh & Rich, 2018; Klintman, 2019; Milner, 2002). In extension, it becomes more or less meaningless to discuss, the discussions fail to inform people and contribute to the democratic ideal of “enlightened understanding” (Dahl, 1998). In the worst case, all that is left is for people to stick to their beliefs, regardless of how erroneous or conspiratorial they might be. At least until reality pushes back in unequivocal forms (O'Connor & Weatherall, 2019).

As illustrated by the aftermath of the 2020 US presidential election, knowledge resistance might also undermine trust in the democratic system as such. Considering that voting is the “*sin qua non* of political participation” (Milner, 2002, p. 25), when people fail to accept the fact that their side lost an election, instead believing that elections are rigged and plagued by fraud, it strikes at the heart of democratic legitimacy and questions a hallmark of democratic governance – the peaceful transfer of power. In fact, when losing an election, the losers can react in three different ways: abide by the results and accept defeat, challenge the results but accept the rules of the game, or turn against democracy (Esaiasson, 2011; Lago & Coma, 2017). When knowledge resistance and

conspiratorial thinking lead political actors or citizens to question the fairness of the rules of the game, it might thus lead to citizens turning against democracy as such. It also increases the likelihood that citizens' support for different authoritarian populists will increase. In fact, a reasonable hypothesis is that the increasing success of authoritarian populism and their rise to power in countries such as Poland, Brazil, Hungary, India, and US during the last decade (Aalberg et al., 2017; Norris & Inglehart, 2019) at least partly can be attributed to the increasing prevalence of disinformation and knowledge resistance (Bergmann, 2018).

Purpose of the Book

Against this background and from both a scholarly and societal perspective, it has become increasingly important to better understand knowledge resistance and its nature, causes, and consequences. While there is a growing body of research pertaining to knowledge resistance and related areas, thus far, most of this research is scattered across academic disciplines, and mostly published in specialized academic journals. Due to the format and nature of articles in academic journals, these are furthermore usually tailored to other scholars within a particular academic discipline and focused on certain rather narrow research problems. What is largely missing, however, is a broader and more integrative understanding of knowledge resistance in high-choice information environments that crosses academic disciplines and that accounts for factors at both the macro- and micro-levels.

To help remedy this, the overall purpose of this book is to bring together scholars from different academic disciplines to analyze knowledge resistance in contemporary high-choice information environments. Altogether this book consists of 14 chapters, written by scholars from philosophy, psychology, media and communication, and political science. Our hope is that this will ensure that important insights and lessons from different disciplines are shared and integrated, and thereby bring us closer to a better understanding of knowledge resistance. That, in turn, might help us find remedies to knowledge resistance.

In the rest of this chapter, we will broadly outline our approach toward understanding knowledge resistance and its antecedents, before introducing the chapters in this book.

Toward Understanding Knowledge Resistance and Its Antecedents

Our starting point is that knowledge resistance is not simply a matter of individual failings. While people often think they know more than they do (Sloman & Fernbach, 2017), what people hold to be true depends upon what information is available, what information people are exposed to and pay attention to, how people process and assess the veracity of information, and how the processing of information is influenced by and interact with social, political, and psychological

factors (Klintman, 2019; McIntyre, 2018; O'Connor & Weatherall, 2019). It might also be dependent on the issue or topic at hand. A person might very well be knowledge-resistant with respect to some issues but not others.

Hence, understanding knowledge resistance requires understanding its nature and disentangling the complex interaction between individual cognitive processes and reasoning, social processes, and the information environment in which people are located. Human knowledge is essentially social in the sense that our knowledge of the world beyond our personal experiences depends on personal, impersonal, and mediated interaction with others (Lippman, 1922; Mutz, 1998; Sloman & Fernbach, 2017). In fact, in modern societies, whatever we know or think we know largely consists of information and beliefs we have acquired from others, either directly or – even more often – through various media (Shehata & Strömbäck, 2014), and more or less conscious assessments of what sources of information to trust. This helps explain the apparent paradox that knowledge resistance seems to be on the rise at the very same time that we have access to more information than ever.

From Low- to High-Choice Information Environments

One of the most important transformations during the last decade is the transformation from low- to high-choice media and information environments (Castro et al., 2021; Prior, 2007; Van Aelst et al., 2017). In the early days of the digital revolution, many thought that digital and online media heralded a revitalization of the democratic public sphere and a democratization of knowledge, but over the years, it has become apparent that this transformation represents a Janus-faced development. On one hand, the entry barriers to participation in the democratic public sphere are lower than ever, and virtually anyone with a computer or a smartphone can now take part and participate in debates on current affairs on an ever-increasing number of social networking sites and other digital platforms (Bennett & Segerberg, 2013; Chadwick, 2013). There is also a greater abundance of information than ever, including information from news media on traditional, online and social media platforms, political organizations and institutions, public authorities, various alternative media, messaging apps, online forums, and video-sharing sites. It has also become easier than ever to access information from public authorities. Official statistics, to take one example, are now readily available and often searchable online, whereas in the past, they were not. Similarly, academic publications have never been as easy to search for, find, and get access to. More broadly, science has also become increasingly popularized, as evidenced by, for example, popular science magazines, TED-talks, science festivals, and scholars disseminating their findings and discussing their research on personal websites or social media. Hence, the digital revolution and the transformation into high-choice information environments mean that virtually anyone now can find high-quality information about almost any topic of interest.

On the other hand, increasing availability does not necessarily translate into greater usage. In fact, greater choice opportunities mean that people have to

become increasingly selective with respect to what media and other types of information they expose themselves to and pay attention to (Luskin, 1990; Prior, 2007). Such selective exposure can be active and goal-oriented, in the sense that people consciously become more selective in their media and information use, but it can also be more passive and result from other patterns of behavior in people's everyday lives (Knobloch-Westerwick, 2014; Metzger & Flanigan, 2002). Important in this context is the so-called OMA-model, which stands for *Opportunities, Motivations, and Abilities* (Luskin, 1990). According to that model, the greater choice opportunities there are, the more selective people have to be, and the more selective people have to be, the more important their individual motivations and abilities become (DelliCarpini & Keeter, 1996; Luskin, 1990; Prior, 2007; Strömbäck et al., 2013). Being selective can be seen as a kind of survival strategy to avoid information overload.

Thus, while the transformation into high-choice and increasingly digital media environments means that virtually anyone now can find high-quality information about almost any topic, it also means that citizens' motivations and abilities simultaneously assume greater importance. While some citizens have the motivation and ability to expose themselves to, seek out, and comprehend high-quality information, others lack either the motivation or the abilities. Similarly, while some have the ability to differentiate between low- and high-quality information, others have less skills in media and information literacy. The result is likely to be increasing inequalities in media and information use, and in extension how much and what people learn from whatever media and information they make use of (Aalberg et al., 2013; Castro et al., 2021; Damstra et al., 2021; Dimitrova et al., 2014; Kümpel, 2020; Wei & Hindman, 2011). In line with this argument, research suggests increasing differences in news media use across time, that news avoidance has increased, and that factors such as political interest and educational level as well as political preferences have become more important predictors of news media use (Aalberg et al., 2013; Bergström et al., 2019; Blekesaune et al., 2012; Karlsen et al., 2020; Prior, 2007; Strömbäck et al., 2013; Stroud, 2011; Toff & Kalogeropoulos, 2020).

Increasing Prevalence of Mis- and Disinformation

While the transformation into high-choice information environments has increased the supply and accessibility of high-quality information and news media, to understand knowledge resistance, it is fundamental to recognize that it has also resulted in an increase of both media content that has nothing to do with information about politics and society and an increasing prevalence of mis-information and disinformation.

Beginning with the former, virtually all evidence shows that the major increase in the total media supply is related to content that has very little or nothing to do with information about politics and society, broadly defined. Most newer television channels focus on areas such as entertainment, drama, sports, and movies, and with the addition of pornography, the same holds true for most websites

(Hindman, 2009; Prior, 2007; Van Aelst et al., 2017). Similarly, most of what is being discussed on social media, video-sharing sites, and messaging apps revolve around personal matters and various forms of entertainment. Hence, while there is no doubt that the *absolute amount* of information pertaining to politics and society has increased, it is also the case that the *relative amount* of such information has declined (Hindman, 2009; Van Aelst et al., 2017). An important implication is that it has become easier both to find and to avoid news or other types of information about politics and society. This holds true, even though many encounter news and other types of societally relevant information incidentally when using digital and social media for other purposes (Fletcher & Nielsen, 2017; Weeks et al., 2017). As noted above, it also means that people's motivations and abilities have become more important predictors of their media and information use.

Another important change is that the supply of partisan or politically slanted media has increased, particularly online. These range from media that straddle the line between traditional news media and political alternative media, to political alternative media that fully engage in politically motivated and biased information dissemination. While the former, to some extent, adhere to traditional journalistic norms and values such as verifying the news and covering the news fairly and accurately (Kovach & Rosenstiel, 2021), the latter do not and are mainly seeking to spread whatever information fit their political agendas and frame issues and events to support a particular political perspective. In the US, Fox News is an example of the former, while Breitbart is an example of the latter (Benkler et al., 2018). Then, there are also a significant number of online media and forums that traffic in outright conspiracy theories (Benkler et al., 2018; Bergmann, 2018; Önnersfors & Krouwel, 2021).

Many political alternative media also traffic heavily in disinformation and what is often called *fake news* (Benkler et al., 2018). As these terms are often used ambiguously, let us clarify what these concepts refer to. By *disinformation*, we refer to intentionally false and misleading information created and disseminated to achieve some political or economic ends (Benkler et al., 2018; Kavanagh & Rich, 2018). By *fake news*, we refer to media content that intentionally is low in facticity while presented to mimic journalistic formats, also to achieve some political or economic ends (Egelhofer & Lecheler, 2019; Tandoc, 2019; Tandoc et al., 2018). Both terms stand in sharp contrast to *misinformation*, which refers to information that is false or misleading but without any intention to deceive (Benkler et al., 2018; Chadwick & Vaccari, 2019; Kavanagh & Rich, 2018). From this, it follows that fake news constitutes one form of disinformation.

Exactly how much the overall supply of disinformation and fake news has increased is probably impossible to quantify, but virtually all observers agree that it has indeed increased (Benkler et al., 2018; Kavanagh & Rich, 2018). How many misinformative and fake news sites there are, and how widely they are used, varies across countries though (Fletcher et al., 2018). The same holds true for the prevalence and reach of political alternative media (Heft et al., 2019; Newman et al., 2020; for a definition of alternative media, see Holt, Figneshou

& Frischlich, 2019). Most research thus far has been done in the US in the aftermath of the 2016 presidential election. Here, one study found that about 40% visited a fake news site during the final weeks of that election campaign and that social media functioned as a major gateway to these sites (Guess et al., 2020). Another study focused on stories deemed by fact-checkers as fake, and also found that social media functioned as a more important gateway to fake news than to traditional news. It also found that pro-Trump fake stories were shared on Facebook about 30 million times – compared to about 7.6 million times for pro-Clinton fake stories (Allcott & Gentzkow, 2017). At the same time, several studies show that both visiting fake news sites and sharing information from them in the US are highly concentrated among a rather small group of mainly highly conservative citizens (Allcott & Gentzkow, 2017; Grinberg et al., 2019; Guess et al., 2019; Guess et al., 2020), while knowledge of various fake stories is more widespread than the actual use of this kind of websites. This suggests that fake stories and disinformation find their way also to people not searching for such information. While most attention thus far has been paid to the role of social media in disseminating false information (Allcott & Gentzkow, 2017; Grinberg et al., 2019; Tandoc et al., 2018; Vosoughi et al., 2018), a review of the literature suggests that many citizens in fact learn about fake stories through the coverage of them in mainstream news media (Tsfati et al., 2020). Hence, while the purpose of mainstream news media covering fake news stories and disinformation might be to fact-check and debunk them (Graves, 2016), they may inadvertently contribute to the dissemination of such information (Tsfati et al., 2020). A case in point might be the news media coverage of Donald Trump. During his presidential tenure, he spread about 25,000 falsehoods, lies, and misleading claims, and while political alternative media were and continue to be more than willing to both disseminate and amplify politically congenial disinformation (Benkler et al., 2018), many of Trump’s falsehoods, lies, and misleading claims were also covered by traditional news media (Kessler et al., 2020).

Biased Processing and Factual Belief Polarization

While there is little doubt that the overall prevalence of misinformation and disinformation has increased, not everyone is equally exposed to such information, and how people process such information varies across individuals. Important in that context are several interrelated cognitive processes and mechanisms.

To begin with, an observation of fundamental importance is that people have a clear tendency to prefer information that is consistent with and hence confirm their attitudes and beliefs over information that is discrepant (Kunda, 1990; Lodge & Taber, 2013; Nickerson, 1998). A key theoretical concept in this context is *confirmation bias* (Wason, 1960), which broadly refers to the seeking or interpreting of evidence in ways that are partial to whatever beliefs or attitudes people already have (Lilienfeld, Ammirati, & Landfield, 2009; Nickerson, 1998). One key reason is that information that runs counter to people’s beliefs, attitudes, or behaviors might lead to *cognitive dissonance*, which

is psychologically uncomfortable (Festinger, 1957). To avoid such dissonance, people are both likely to avoid situations and information that is anticipated to increase dissonance, and when experiencing dissonance, be motivated to interpret information to achieve greater consonance and decrease the sense of dissonance (Festinger, 1957).

One consequence is that people are likely to be selective in terms of what media or other types of information they expose themselves to and pay attention to (Hart et al., 2009; Knobloch-Westerwick, 2014; Smith et al., 2008). This selectivity might manifest itself both through *selective exposure* to attitude-consistent information and through *selective avoidance* of attitude-discrepant information (Garrett, 2009a, 2009b). Numerous studies have also shown that people are selective in their media use and that partisan or ideological preferences have an impact on people's media use – but also that the tendency to prefer attitude-consistent information seems to be stronger than the tendency to avoid media and information that is attitude-discrepant (Dahlgren et al., 2019; Garrett, 2009a, 2009b; Garrett et al., 2013; Iyengar & Hahn, 2009; Knobloch-Westerwick, 2014; Stroud, 2011; Winter et al., 2016).

Beyond exposure, confirmation biases also manifest themselves through how people process and interpret information they encounter. They may, for example, weigh evidence or facts that support a certain belief or attitude more heavily than information that runs counter to them, evaluate congruent information as stronger and more compelling than incongruent information, spend more time and cognitive efforts at counterarguing incongruent facts and arguments than in scrutinizing congruent facts and arguments, and simply disregard facts and evidence that are attitude-incongruent (Hart et al., 2009; Kahan, 2016a, 2016b; Kunda, 1990; Lilienfeld et al., 2009; Lodge & Taber, 2013; Nickerson, 1998). Such biased processing of information and *motivated reasoning* is particularly likely when people are motivated by *directional goals* rather than *accuracy goals*. When people are motivated by accuracy goals, “they expend more cognitive effort on issue-related reasoning, attend to relevant information more carefully, and process it more deeply” (Kunda, 1990, p. 481). In contrast, when people are motivated by directional goals, they “search memory for those beliefs and rules that could support their desired conclusion. They may also creatively combine accessed knowledge to construct new beliefs that could logically support the desired conclusion” (Kunda, 1990, p. 482).

Importantly, both the processes of selective exposure and attention and reasoning motivated by directional goals are often unconscious. In other words, people are typically not aware that they select information based on whether it is congruent with their attitudes and beliefs rather than based on which information is most relevant or of the highest quality, that their thought processes are biased by the motivation to reach a certain conclusion, and that they are making use of only a subset of all the knowledge and information they have and that might be relevant (Kahan, 2016a; Kunda, 1990; Lodge & Taber, 2013; Nickerson, 1998). In the words of Lodge and Taber (2013, p. 24), “motivated reasoning – the systematic biasing of judgments in favor of automatically

activated, affectively congruent beliefs and feelings – is built into the basic architecture and information processing mechanisms of the brain”. People might think that they are rational when they are in fact rationalizing the beliefs and attitudes they already have.

Importantly, these processes are at work not only with respect to attitudes in the sense of evaluating issues more broadly “with some degree of favor or disfavor” (Eagly & Chaiken, 1993, p. 1). They are also at work with respect to factual beliefs about empirical matters. Is there a process of global warming? Can vaccines have serious side-effects such as causing autism? Is genetically modified food dangerous to eat? Does immigration help or hurt the country’s economy? Was the 2020 US election rigged? These are matters not of opinion or attitudes but of empirical evidence.

Also important to note is that when people disagree with respect to attitudes and opinions, such as whether taxes should be lowered or raised, they are usually highly aware that people have different opinions and find that both understandable and acceptable. When they disagree with respect to factual beliefs, they instead tend to fall back on a position where there is a clear right and wrong. Hence, the other side in a factual dispute is thought not only to have a different opinion but to be wrong, while simultaneously claiming or insinuating that oneself is wrong. In such situations, people are likely to become more suspicious of the motives or character of another side. Both the affective and the cognitive reactions are also likely to be more intensive compared to when someone just has a different attitude. Thereby, biased processing and factual disputes might contribute to increasing factual belief polarization (Kahan, 2016a, 2016b; Lodge & Taber, 2013; Lord et al., 1979; Rekker, 2021; Taber & Lodge, 2006).

This holds true not least in political contexts where “[d]efining what is true and false has become a common political strategy, replacing debates on a mutually agreed set of facts” (Vosoughi et al., 2018). Whether described as partisan or political polarization, it generally refers to a process where political elites and/or citizens increasingly move further away from each other, and that might happen with respect to attitudes (*attitude polarization*) as well as beliefs (*factual belief polarization*) and emotions toward the other side(s) (*affective polarization*) (Hopkins & Sides, 2015; Iyengar et al., 2012; Oscarsson et al., 2021; Rekker, 2021; Sartori, 2005). Importantly, polarization might occur either because people move in different directions or because they increasingly sort themselves into different political camps (Baldassarri & Gelman, 2008; Hopkins & Sides, 2015; Rekker, 2021). Although there are divergent scholarly views both with respect to how to explain polarization and whether the development should be described as *polarization* or rather as *sorting* (Fiorina & Adams, 2008; Hopkins & Sides, 2015; O’Connor & Weatherall, 2019; Oscarsson et al., 2021; Webster & Abramowitz, 2017), it is clear that on many issues and beliefs, people belonging to different parties or with different ideological leanings have divergent perceptions and worldviews. Examples include views on climate change (Dunlap et al., 2016), how immigration influences the country (Pew Research Center, 2019), crime rates among immigrants and the prevalence of voter fraud (Peterson & Iyengar, 2020), and views on Covid-19 (Pew Research Center, 2020).

Misperceptions and Knowledge Resistance

While democratic theory holds that people should be at least reasonably informed for democracy to function well (Dahl, 1998; Milner, 2002; Rosenfeld, 2019; Wikforss, 2021), a persistent empirical finding is that most citizens do not know very much about politics and society. As bluntly noted by Bartels (1996, p. 194), “The political ignorance of the American voter is one of the best-documented features of contemporary politics” (see also DelliCarpini & Keeter, 1996). Although that statement might be too blunt (Oscarsson & Rapeli, 2018), numerous studies have shown that people hold misperceptions related to, among other things, the number of immigrants in their country, Brexit, welfare policies, foreign policy, the development of violent crime, the number of deaths from terror attacks, the linkage between vaccines and autism, the prevalence of sexual harassments, the amount of energy coming from renewable sources, and the level of unemployment (Flynn, 2016; Flynn et al., 2017; Ipsos, 2017, 2018; Kuklinski et al., 1998; Nyhan & Reifler, 2015; Policy Institute, 2018; Sides & Citrin, 2007). The list could easily be extended.

A key question is however whether factually incorrect answers in surveys reflect that people are *uninformed* or *misinformed*. As suggested by Kuklinski et al. (2000), an important distinction should be made between being *informed* (people have factual beliefs and these are correct), *uninformed* (people do not have factual beliefs but might still guess the answer when asked factual questions), and *misinformed* (people hold factual beliefs and these are wrong). In the context of knowledge resistance, this distinction is important for several reasons. First, although misperceptions may be rooted in a lack of information, they may also be rooted in motivated reasoning (Flynn et al., 2017; Kahan, 2016b; Kunda, 1990; Lodge & Taber, 2013). Second, whereas a lack of information can be remedied by providing relevant and correct information, it might not help if people are misinformed and their misperceptions are rooted in directionally motivated reasoning. Third, misperceptions might have a greater impact on people’s attitudes and behavior than a simple lack of information (Ahler & Sood, 2018; Hochschild & Einstein, 2015; Kuklinski et al., 1998; Li, 2020). This is why Patterson (2013, p. 10) states that “there is something worse than an inadequately informed public, and that’s a misinformed public”. Similarly, O’Connor and Weatherall (2019, p. 185) conclude that “Public beliefs are often worse than ignorant: they are actively misinformed and manipulated”. Fourth, whereas being uninformed is unlikely to result in knowledge resistance, being misinformed is closely linked to resistance toward knowledge than run counter to people’s beliefs (Flynn et al., 2017).

To understand knowledge resistance thus requires that both a theoretical and empirical distinction are made between carrying misperceptions due to a lack of knowledge (being uninformed) and carrying misperceptions due to biased information seeking and reasoning (being misinformed). Not all misperceptions are due to biased information seeking and reasoning – they may also be due to honest mistakes – but many are. Consequently, while public ignorance is a problem, it is not the same problem as knowledge resistance. They may be interrelated but are conceptually distinct and need to be analyzed separately.

Introduction of the Chapters

Beyond this introductory chapter, the book consists of 13 chapters. The first of these, [Chapter 2](#), is titled *What is knowledge resistance?* and is written by Kathrin Glüer and Åsa Wikforss. The chapter provides a philosophical guide to the concepts that are of importance for empirical investigations of knowledge resistance, in particular the central concepts of knowledge, evidence, and rationality. Starting from the long-established idea that knowledge requires true, justified belief, Glüer and Wikforss stress the importance of focusing the study of knowledge resistance on clearly factual judgements the truth of which can be investigated by empirical methods. A central idea in the chapter is that knowledge resistance always involves irrationality, and the authors discuss how this is to be understood. The relevant notion of rationality is that of belief rather than that of action, more precisely, that of epistemic irrationality. An important psychological mechanism resulting in such irrationality is motivated reasoning, involving belief formation driven by directional goals and desires rather than by epistemic reasons. Politically motivated reasoning in particular is widely thought to provide the explanation for the phenomenon of fact polarization. As has been pointed out in the literature, however, there are challenges to the experimental detection of motivated reasoning, in particular challenges deriving from the potentially rationalizing role of prior belief in explanations of peoples' reactions to evidence. When priors line up with motivations, these two factors are difficult to disentangle. Even so, there might be irrationality behind polarization; it might, for instance, take the form of unjustified beliefs about which sources of testimonial evidence are trustworthy.

To capture the difference between these cases, Glüer and Wikforss propose that we distinguish between knowledge resistance in a narrow sense, involving an epistemically irrational response to evidence that the subject has, and knowledge resistance in a wider sense. In the wider sense, knowledge resistance can also result from things such as avoidance of easily available evidence or irrational trust in, or distrust of, the sources of such evidence. The authors end by noting that this wider notion comes with its own detection challenges and requires further elaboration.

Knowledge resistance is hence the result of a complex interaction between individual cognitive processes and reasoning, social processes, and the information environment in which people are located. Not least important to understand knowledge resistance in contemporary societies is the role of the media as a key source of information, and the transformation from low- to high-choice media environments over the last decades. This is analyzed in [Chapter 3](#), written by Jesper Strömbäck, Hajo Boomgaarden, Elena Broda, Alyt Damstra, Elina Lindgren, Yariv Tsfati, and Rens Vliegenthart.

In this chapter, the authors analyze how the transformation into high-choice media environments has altered the interaction between the supply of different types of mediated information and people's exposure to and processing of it. Among other things, this process has weakened traditional news media and lowered the entry barriers to the public sphere. It has also enabled the rise of

various “alternative media” pursuing political goals rather being governed by journalistic norms and values. In contrast to news media that are characterized by reality check dynamics, political alternative media have been found to be characterized by propaganda feedback loops where the veracity of information is less important than whether information serves political goals and provides partisan-consistent and identity-conforming news (Benkler et al., 2018). The increasing supply of political alternative media has thus contributed to an increasing supply of misinformation. It has also created more favorable opportunity structures for political selective exposure, where people seek out information that can be expected to provide attitude- and belief-consistent news. In the end, the authors identify six interconnected routes through which the transformation into high-choice media environments has facilitated knowledge resistance. At the same time, they also note that this transformation interacts with and is shaped by other institutions and processes of change, whether they are technological, social, cultural, or political. One key implication is that neither the development nor the current situation is the same in all countries. Some research also suggests that resilience toward misinformation is greater in some countries than others depending on, among other things, levels of polarization and the strength of public service broadcasting. At the same time, most research thus far has been done in the US, characterized by the opposite characteristics. An important task for future research is thus to broaden research in this area to include more countries and to further identify factors that might help increase resilience toward misinformation.

In [Chapter 4](#), Sophie Lecheler and Jana Laura Egelhofer provide a map of the supply chains of disinformation, misinformation, and fake news. They note that only little is known about the precise amount of false information that is supplied around the globe, and what the actual exposure is. This is partly because of a lack of access to social media data, and partly because the supply is often a covert action. In the chapter, the authors focus on what is known about the actors and their motivations, and the complexity of the supply chain is stressed. A distinction is drawn between the creation and the dissemination of inaccurate content, and it is noted that what starts as disinformation (intentionally incorrect information) can come to be shared unintentionally, in which case it qualifies as misinformation (unintentionally incorrect content). Lecheler and Egelhofer identify three types of actors: political actors, media actors, and citizens. In the case of political actors, the supply chain involves party actors in full public scrutiny, such as Donald Trump. Another kind of political actors is foreign state actors and intelligence services, who create and spread disinformation in secrecy. When it comes to media actors, the supply chains involve a mix of unintentional errors in traditional media, hyper-partisan media outlets, and social media platforms. Finally, private individuals play a decisive role in the supply of mis- and disinformation. The authors stress that in the case of private citizens, there is insufficient knowledge about the motivations behind the dissemination.

Lecheler and Egelhofer conclude by proposing that in addition to developing the empirical research on supply chains, future research should address another

important aspect of the unreliable information landscape – the consequences of prolonged debates about the dangers of disinformation in society. The challenge for the democratic society is clear. On one hand, we need to openly discuss the dangers of disinformation. On the other hand, when these discussions come into focus there is a risk that citizens resist correct information as a result of a general loss of trust.

In [Chapter 5](#), Daniel Sude and Silvia Knobloch-Westerwick discuss a distinctive challenge of the high-choice information environment, selective or biased exposure. The authors review the role of confirmation bias in driving selective exposure. Confirmation bias involves a preference for information that is consistent with pre-existing attitudes and beliefs. When it comes to media choice, this may manifest itself in a preference to search for information in favor of a specific political policy. Sude and Knobloch-Westerwick focus on the motivations behind confirmation bias, both motivations having to do with defending one's own views and social influence processes. The findings show that people may perceive attitude-consistent information as rewarding, and attitude-discrepant information as threatening. However, the authors also stress that, at times, people behave in a way that conforms more closely to a normative ideal, actively seeking out high-quality information that goes against their beliefs and revising their beliefs accordingly. When it comes to influence from social peers, social identities play an important role in motivating the confirmation bias. For instance, people with strong partisan identities consume more partisan political media which, in turn, means that they become more confident in their partisan identity.

Studying the motivations driving confirmation bias is important also since it provides clues as to how the bias may be counteracted. An interesting observation, Sude and Knobloch-Westerwick note, is that rendering non-partisan identities salient could overcome confirmation bias. This may carry an important lesson. In a society where political identities are increasingly salient, counteracting confirmation bias may require making other identities more salient, such as our shared identity as citizens. Another important observation is that asking people to carefully justify their opinions to third parties, inspires a more careful and even-handed consideration of evidence and arguments. The authors stress that this is harder to implement in the wild, but it is an interesting idea that strengthening the deliberative dimension of democracy may serve to counteract confirmation bias.

Although external factors play a pivotal role in driving knowledge resistance, it is understood as a phenomenon arising at the level of individual agents. In [Chapter 6](#), Eliot Michaelson, Jessica Pepp, and Rachel Sterken argue that there is an interesting sense in which evidence resistance can arise at the level of a public conversation and that whole societies may exhibit this kind of resistance. Their idea is that a public conversation shows resistance to evidence when it becomes overly focused on irrelevant topics, on topics that the members of the group that the conversation concerns do not in fact need to know. The resistance is systematic when the conversation is structured in such a way that matters of importance are kept out of the conversation. For instance, the authors suggest,

the public conversation after Brexit may become dominated by a discussion of Royal intrigues, rather than post-Brexit trade agreements, preventing UK residents from discussing and learning of evidence of importance to them in their capacity as UK residents. The challenge, then, is not that the conversation is dominated by inaccurate claims, but that it is dominated by irrelevant information. However, the authors suggest, in this case too social media plays a decisive role since it can be weaponized in unprecedented ways to steer a conversation toward the irrelevant. For instance, bots and bad actors have the capacity to flood public discourse with irrelevant information in order to manipulate the attention of news consumers.

In their chapter, the authors provide a philosophical analysis intended to illuminate the nature of relevance-based resistance to evidence. They present a model of how public conversations are structured, and they outline two different ways for public conversations to develop relevance-based resistance to evidence. The first involves the “crowding out” of important information, as illustrated by the post-Brexit conversation on Royal intrigues. The second stems from the conflation of different public conversations and the groups they concern. As participants on social media, we consume news of varying degrees of public importance, mixed in with an undifferentiated stream of the content and reactions of friends, funny videos, and advertisements. As a consequence, the authors propose, it is much more difficult to determine the relevance of a given news report – Is it supposed to be important for Swedish citizens, for residents in Uppsala, or for other groups? Under such circumstances, without any well-defined epistemic interests, the public conversation is left to blow with the winds of what grabs people’s attention.

Chapters 3–6 are all focused on the media and information environment and how it contributes to peoples’ resistance to available knowledge. At the individual level, understanding knowledge resistance requires studying human cognition. Of particular interest, in a highly partisan era, is the field of political cognition, where the tools of cognitive psychology and experimental political science are used to explore the psychological determinants of political judgment and responsiveness to evidence. In Chapter 7, Nathaniel Rabb, Małgorzata Kossowska, Thomas J. Wood, Daniel Schulte, Stavros Vourloumis, and Hannes Jarke discuss some important such determinants. They start by noting that it is well established that people make judgments along partisan lines. However, they stress, this is not to be written off as necessarily irrational, but should be seen as a reflection of the social dimension of human knowledge. Group cues can be valid cues in a complex world, where the community one belongs to constitutes an important source of information. Trusting one’s community may therefore be a reasonable shortcut, rather than a cognitive deficit. This raises the important question of why people belong to these groups in the first place. The authors suggest that personality factors play a role, such as differences in threat sensitivity and tolerance for uncertainty. Scholars have also identified different cognitive styles, an “open” type typically associated with liberalism and a “closed” type associated with political conservatism. Other important determinants of how we respond

to evidence, discussed in the chapter, are various heuristics (mental shortcuts) and biases.

Finally, trust in information sources plays a central role in how people evaluate information. In a high-choice environment, the burden of identifying good information is shifted from the traditional gatekeepers to laypersons. The authors distinguish two key dimensions of perceived source credibility, expertise and honesty, but they also note that people tend to trust sources for other reasons, such as commonality of interests (as in the case of Republicans trusting Trump). In general, they suggest, the topic of trust is understudied given the collapse of the gatekeeper system, and more research is needed on these different dimensions of source credibility. In the case of scientific claims, however, there is a growing body of research on source credibility. For instance, there are the findings on asymmetric trust, where trust in the scientific community has declined among US Conservatives since the 1970s. But research also shows that the trust in science is issue-sensitive. The authors end by stressing an important point. Even if these various factors determine political judgments they do not do so unfailingly, and there are strategies to counteract the resistance to evidence.

In [Chapter 8](#), Henri Santos, Michelle Meyer, and Christopher Chabris investigate the role of trust in the domain of health and medicine. In contrast to many other domains where trust and knowledge resistance are investigated, health and medicine touch upon people's everyday lives and well-being, and this may result in higher trust than in other domains. But instead of asking people how much they trust different sources of medical information, in a set of three experiments, they offered participants the opportunity to read an article from one of a number of information sources giving advice on how to manage a medical condition that concern them. Examples of such medical conditions are cancer, chronic kidney disease, diabetes, and heart disease. The sources of information included in the experiments varied in type (individual figure, institution, and representative surveys) as well as characteristics (e.g., physician scientist, journalist, layperson, celebrity, survey of patients versus doctors).

Among other things, their results show a majority of respondents look to medical professionals or to patients with first-hand experience of the medical condition they were concerned about, with most people choosing a society of medical professionals. The results also suggest that this holds both for medical conditions that participants were concerned about and other medical conditions, and that the highest mean rankings went to domain-specific experts and groups of medical experts or patients with first-hand experience of the medical conditions, and the lowest mean ranking to celebrities and physician in an irrelevant domain. Altogether, this suggests that trust in expertise is far from dead, and that talk about "the death of expertise" does not apply with respect to health expertise. At the same time, the experiments show that it might be quite easy to manipulate people's perception of expertise, which may be used both to spread misinformation and to use sources of expertise as vectors for misinformation.

Although the frequent talk of knowledge resistance is a fairly recent phenomenon, there are several long-standing research areas within the political science

literature that are connected to the broad theme of knowledge resistance. In [Chapter 9](#), Paula Szewach, Jason Reifler, and Henrik Oscarsson identify the strands of political science literature that they consider particularly helpful. One such strand is the literature on how well informed the public is when it comes to politics. The research examining citizens' political knowledge includes, among other things, research on how to measure political knowledge, examining systematic differences in knowledge across the population, and the antecedents of political knowledge. An interesting observation is that sophistication is higher and more widespread among voters in multi-party systems, suggesting that the political institutions themselves have consequences for the political knowledge of the citizens. A second important strand is the work on cognitive biases that limit or prevent people from accepting available knowledge, and the tension between rationalist and psychological accounts of political behavior. The authors note that research in political science has moved away from rational choice theory toward the idea of bounded rationality, as found in Tversky and Kahneman, and that since the early 2000s, it is widely accepted that preferences can affect both how people acquire and evaluate information.

A third important research field that is of relevance to knowledge resistance concerns fact-checking journalism. This represents a radical turn in the practice of journalism, and the movement has gained recognition in terms of its value for democracy. However, as the authors stress, it is not clear to what extent fact checking serves to mitigate the effects of misinformation. It seems that fact checking sometimes has a significant effect for debunking misinformation, sometimes no effect at all, and that there even are (rare) circumstances under which corrections backfire and strengthen the mistaken belief. An important research question is therefore under what conditions correction is effective. One important factor is the person's prior beliefs. People are more likely to accept information that is in line with the beliefs they already hold, and more likely to resist counter-attitudinal corrections. Research also shows that fact-checking is more effective on some audiences than others, and that demographics and political ideology matters. In Europe, for instance, more favorable attitudes toward fact checking are found among people who are more inclined to the left, pro-EU, and more satisfied with democracy. This illustrates the challenges faced in a high choice information environment, where there is a large volume of misinformation. Once the misinformation is out there, it may be very hard to correct it, in particular when it aligns with prior political beliefs. Indeed, the danger is very great that the effort to fact check in itself, comes to be viewed and evaluated in a partisan light.

While research on political knowledge – in a broad sense – has been an integral part of research on political attitudes and behavior more generally for several decades, research on misperceptions is more recent. In this research, a key conceptual distinction is between being *informed* (having accurate beliefs), *uninformed* (lacking factual beliefs), and *misinformed* (having beliefs that are inaccurate). However, while there is broad conceptual consensus about this distinction, empirically it has proven more difficult to differentiate between the

uninformed and the misinformed. Incorrect answers to knowledge questions – in particular when they pertain to more or less controversial issues such as climate change, vaccines, or immigration – may signal that people lack information and are uninformed, but they may also signal that people hold inaccurate beliefs and are misinformed. This is also evident in extant research, as incorrect answers to the very same or highly similar questions have been interpreted as both lack of knowledge and misperceptions. From the perspective of knowledge resistance, the difference between being uninformed and misinformed is however crucial.

To move research forward, there is thus a need for refined approaches to differentiate the uninformed from the misinformed in survey-based research. This challenge is taken up in [Chapter 10](#), written by Elina Lindgren, Alyt Damstra, Jesper Strömbäck, Yariv Tsfati, Rens Vliegenthart, and Hajo Boomgaarden. In that chapter, the authors argue that scholars need to conceptually acknowledge that there are more reasons for giving wrong answers in surveys than lack of knowledge or false beliefs. They also review how scholars hitherto have tried to measure misperceptions on the operational level, while discussing weaknesses and strengths of different approaches. Examples of such approaches include having “don’t know”-options, using confidence indicators, and offering incentives for correct answers, among others. In the end, they outline a framework for addressing the conceptual-operational gap in future research on misperceptions. While acknowledging that there may not be a universal solution, among other things they argue for the use of repetitive measures and panel surveys as promising means to differentiate between the misinformed and the uninformed. As the authors note, based on the principle that the probability of making the same (un)lucky guess by chance decreases with repetition, testing the same beliefs repeatedly should identify the uninformed via random changes across measurements, and the misinformed by systematic (in)stability across the same.

Human knowledge rarely involves complete certainty. This poses epistemic challenges, as illustrated during the first few months of the COVID-19 pandemic, where what was thought to be knowledge one week turned out to be mistaken the next. In political psychology, the quest for certainty has been investigated from a different angle, exploring what characterizes of cognition that is driven by this quest. In [Chapter 11](#), Małgorzata Kossowska, Gabriela Czarnek, Ewa Szumowska, and Paulina Szwed review research on how the motivation to achieve certainty affects cognition. The quest for certainty, they argue, is a goal that can be achieved by various means, by biased cognitive strategies as well as by accuracy-oriented ones. The authors stress that knowledge formation is a rather orderly process of hypothesis generation and validation. The process is normally initiated when there is a lack of information, and it can reflect the need for nonspecific certainty (the need to arrive at any conclusion whatsoever that is certain) or specific certainty (the need to attain certainty on a concrete statement, for instance, that vaccinations against Covid-19 are safe). Research on motivated cognition shows that when people are motivated by the specific need for certainty, and the topic is suffused with culturally diverse meanings, they tend to become more involved in identity defensive cognitions. For example,

right-wing adherents tend to be stricter about abortion ban when uncertainty is present. The need for non-specific certainty, on the other hand, promotes simplistic cognition relying on stereotypes and simple rules that lead to fast decisions. In short, under this motivation, knowledge systems become rigid and closed to new evidence.

However, the chapter stress that there are some contradictory findings, suggesting that the motivation to non-specific certainty may also drive people to complex, effortful, and unbiased cognitions. For instance, people are willing to consider and incorporate new information in order to improve their ability to make predictions. This raises the question of how to distinguish the conditions under which the quest for certainty leads to open-minded cognition and when it leads to simplistic, biased cognition, and the chapter ends with a discussion of this challenge. It is argued that we need to distinguish the goal, certainty, from the means, cognitive strategies. The latter may differ while the goal remains the same. The means chosen also depends on the relation between the goal of certainty and other goals the individual may have. The authors discuss research that suggests that under certain conditions, people tend to perceive open-minded cognitive strategies as more instrumental to reaching the goal of certainty than close-minded strategies. It is therefore important to provide clues indicating that a given goal is best attained when engaging in unbiased information search. If this is correct, it may also suggest a strategy for how to help people choose accuracy-oriented means in the case of specific motivation. The authors suggest that the value of accuracy-oriented strategies to achieve certainty can be communicated through education systems that cultivate curiosity, accuracy, and accountability. This, they propose, could eventually lead to less tribe-like discussions than what we see in many societies today.

In an era characterized by division and disagreement, the term polarization is frequently used, often without specifying precisely what is meant. Political scientists stress the need to distinguish between two central forms of polarization, ideological and affective. Ideological polarization concerns divergence and partisan alignment in political views, whereas affective polarization concerns citizens' antagonism toward partisan out-groups. In [Chapter 12](#), Roderik Rekker argues that we need to add a third core pillar of polarization to this taxonomy, capturing the fact that citizens are increasingly divided in their factual perceptions of reality (be it about the climate, immigration, or income inequality). Following Lee et al. (2021), Rekker refers to this phenomenon as factual belief polarization. While this type of polarization also poses a danger to democracy, he argues, research on factual belief polarization so far is sparse and lacking a common conceptual foundation. The focus in political cognition research has been on misperceptions, but even if factual belief polarization is related to misperceptions, it is conceptually distinct according to Rekker. First, factual belief polarization involves misperceptions that are in some way connected to citizens' political views or identity. Second, research on misperceptions has focused on cases where citizens confidently hold beliefs that are blatantly inaccurate (for instance, the belief that Iraq had WMDs when the US invaded),

whereas the challenge for research on factual belief polarization, rather, lies in identifying the factual assumptions that are intertwined with citizens' political attitudes. Rekker uses an example illustrating that in the case of factual belief polarization, both sides of the political divide may hold inaccurate beliefs (about the share of non-Western immigrants), although neither is blatantly mistaken. Even if the citizens are not very confident in their views, this type of factual belief polarization may be quite consequential politically.

The chapter concludes with a discussion of the causal connection between factual belief polarization and other types of polarization, suggesting that it may go in both directions. For instance, populist anti-elite rhetoric may fuel affective polarization and a divergence of trust in science, leading to factual polarization. Conversely, since factual beliefs have implications for policy convictions, increasing factual belief polarization may contribute both to ideological and affective polarization. An important task for future research, Rekker suggests, is both to provide a better description of factual belief polarization across a variety of political issues, and to determine the consequences of this type of polarization, especially for ideological and affective polarization. Rekker also proposes that future research should focus on strategies to prevent and reduce factual belief polarization, for instance, by informing citizens about basic political facts in civics classes.

One reason to worry about knowledge resistance, as emphasized by Rekker, is its implications for a democratic society. In [Chapter 13](#), Jacob Sohlberg argues that it is essential that citizens hold correct factual beliefs when they evaluate arguments for or against different political positions. For instance, citizens may use incorrect beliefs in support of the position that we should fight climate change (as when they exaggerate how much the sea levels will rise) or incorrect beliefs against it (as when they believe that climate change is a normal variation in the climate). When this happens, people's political positions are not based on valid reasons. Sohlberg also stresses that in the case of many political issues, especially the complex ones, people typically have multiple considerations for or against a position and may vacillate between different positions over time. Interestingly, Sohlberg notes, people who are attitudinally ambivalent are less likely to rely on unreliable cognitive shortcuts and more focused on accuracy. Before drawing any conclusions about the pervasiveness of knowledge resistance, Sohlberg argues, it is essential to keep in mind that people typically rely on multiple considerations, including value considerations, and that they often are ambivalent.

The chapter ends with a discussion of an empirical case, the 1980 nuclear power referendum in Sweden, and how studies from the time of the referendum can be used to develop a framework for how to examine what type of reasons people provide for their political positions and to what extent these involve correct factual beliefs.

A key question is what can be done to overcome knowledge resistance. In the final chapter of the volume, Michael Ingre, Torun Lindholm, and Jesper Strömbäck provide a systematic review of the psychological literature on

strategies for counteracting knowledge resistance. Their focus is on experimental studies of responses to new evidence, grouped into four broad categories: framing, argument composition, social learning, and self-affirmation. Framing concerns how information is presented. For instance, researchers have studied the effects of presenting facts in a way that makes it compatible with the individual's worldview, as when facts about climate change are presented in conjunction with suggested solutions that are more compatible with free-market ideology. The studies show that framing matters, and that if it is done right, resistance to evidence can be weakened. When it comes to argument composition, an interesting conclusion is that arguments with high explanatory power make a difference, especially when people are instructed to focus on the explanatory power of the messages. Of particular interest are the studies on self-affirmation, and the chapter discusses three studies that show the promise of this strategy. Put simply, when people feel good about themselves, they are more open to counter-attitudinal evidence.

Overall, the experimental results provide a reason to think that there are several strategies available that serve to counteract knowledge resistance, and that science communicators should not simply focus on providing people with correct information. In particular, they need to be aware of the role played by people's core values and worldviews. The conclusion, it should be stressed, is not that these strategies are to be used as a way of manipulating people's beliefs, not treating them as rational agents, but that they should be used to enhance the capacity for rational reasoning that is in everyone. As the authors write, given the right conditions, people have the capacity to put motivations aside and rationally evaluate the information provided. However, as the authors also stress, more experimental research is needed, giving a clearer picture of what these conditions are. This is perhaps one of the most important areas for future research in the knowledge resistance field.

In conclusion, this volume offers a broad, inter-disciplinary discussion of a central contemporary challenge, the tendency to resist available knowledge. It provides the basic conceptual tools needed to understand the phenomenon, and a detailed discussion of the relevant, cutting-edge empirical research. In doing so, the volume also offers important paths for future research, and provides essential knowledge if we are to develop strategies for mitigating the dangers to individuals and society of the new, high-choice information environments.

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2 What is Knowledge Resistance?¹

Kathrin Glüer and Åsa Wikforss

Introduction

Talk about knowledge (or fact) resistance is becoming increasingly common. A whole host of more or less related phenomena are labelled as such not only in research contexts, but also in public debate and social media discourse. The general impression seems to be of these “resistance phenomena” becoming more common and severe. To take just one example, there seem to be increasing numbers of people in the Western World who do not believe that vaccines are safe, despite strong and easily available evidence to the contrary. At the time of writing, the problematic nature of such resistance is becoming all too clear with the fourth wave of the Covid-19 pandemic sweeping the world and bringing severe illness almost exclusively to the unvaccinated. While we have some indications of what kind of factors are driving vaccine skepticism, the general mechanisms of resisting knowledge aren’t well understood yet. Progress on this front requires research of an unusually high degree of interdisciplinarity. To be successful, interdisciplinary research requires conceptual calibration. This isn’t always easy and, in this case, the situation is aggravated both by unusually many disciplines having to talk to one another and the initial problem description.

As commonly used, talk of “knowledge resistance” tends to remain too loose and too metaphorical for gaining a precise and useful understanding of the core phenomena and the mechanisms producing them. It is thus essential to be precise on what is to be investigated. Given the nature of the initial problem description, this will, to some extent, be a matter of definition. In what follows, we shall offer a philosophical guide to the concepts we take to be most important for any empirical investigation of knowledge resistance and work toward a sufficiently precise characterization of it.

Knowledge resistance involves ignorance, but not all ignorance is the result of knowledge resistance. While ordinary ignorance can, for instance, result from mere lack of information, it is distinctive of ignorance resulting from knowledge resistance that information or evidence has been resisted. And to be resisted, that information or evidence has to be available to the resister. As a first approximation, then, we can say that *knowledge resistance involves resisting available evidence*.

In what follows, we shall unpack this characterization in more detail. There are two things, however, that we would like to be upfront about from the very start. One is that we think that to get at the core of the phenomena of interest, the resistance involved in knowledge resistance should be construed as a form of *irrationality*. When it comes to evidence, what is resisted is the support it provides for a claim or conclusion. Resisting available evidence thus involves not drawing *proper* conclusions: conclusions supported by the evidence. But support comes in degrees. A conclusion might get *some* support from the evidence, but not enough to outrightly believe it. Moreover, different parts of the available evidence can point in different directions. In that case, the question is which conclusions can properly be drawn on the basis of *all* of it.

Here is a little toy story illustrating this. Imagine you are a detective investigating a “manor murder”. Someone has been murdered in a remote English country manor. You have found bloody fingerprints in the butler’s pantry. This is evidence pointing in the direction of his being the murderer. A little later, you also find the murder weapon, a sharp knife missing from the kitchen. You know that the butler and the cook are great friends, and that the cook has a watertight alibi while the butler does not, so this too points toward the butler. But then, you learn that the lord of the manor can expect a large financial benefit from the death of the victim. Moreover, his alibi turns out to be fake. At this point in your investigation, you weigh all the evidence you have gathered and conclude that while both are suspects, you cannot yet draw a conclusion as to who the murderer is – the butler or the lord. Clearly, this is wise. And it should not be classified as knowledge resistance – while you do have evidence that supports either conclusion, the support is not sufficiently strong.²

This illustrates that not every conclusion that is to some extent supported by some available evidence is a *proper* conclusion to draw. The proper conclusion is determined by all the (relevant) available evidence *together*. This conclusion can be of various forms; it can be, for instance, that something is rather likely, but not certain, and it can also be that we have no idea yet (as to who the murderer is, for instance).

The other thing that we would like to bring out from the very start concerns that which is resisted: evidence. Evidence can take many forms – we shall return to that, but what we take to be relevant to the core of the resistance phenomena is *empirical* evidence, evidence concerning things we can investigate and come to know, at least in principle, by empirical means. Such means include scientific experiments, archeological digs, the study of historical documents, surveys and opinion polls, as well as many other things including the use of our eyes and ears.

The notion of knowledge resistance we suggest to work with, then, construes knowledge resistance as a form of irrational resistance to the total available empirical evidence. This characterization needs to be further unpacked to be of use. Both with respect to the notion of resistance and to that of available evidence, we have only scraped the surface so far. Nothing has been said, for instance, about the psychological mechanisms involved. Another thing we need

to say more about is what evidence is and what it means for evidence to be available. In what follows, we shall map out the conceptual terrain in more detail and locate some of the relevant, central questions and results from the empirical literature on this map. Sections 2 and 3 will be about the notions of knowledge and evidence. In Section 4, we explore two things in tandem: the notion of rationality and the kind of psychological mechanism that might explain knowledge-resistant belief formation. Motivated reasoning will be our example here. The final section quickly probes the idea of distinguishing between two types of knowledge resistance, wide and narrow, and points to some complications relating to it.

Knowledge

Although the concept of knowledge is a non-technical concept, playing a central role in our everyday lives, a meaningful discussion of the nature of knowledge resistance requires explicating the concept. To begin, knowledge resistance concerns what philosophers call propositional knowledge, i.e. knowledge *that* something is the case, as opposed to knowledge *how*, skills and abilities. Propositional knowledge involves the subject holding a proposition p true: it involves a *belief*. If I know that global warming is caused by carbon dioxide emissions, then I believe that global warming is caused by carbon dioxide emissions. To determine whether someone is knowledge resistant, therefore, one has to determine what they believe. This is not as straightforward as it may seem, and there are well-known experimental challenges here. For instance, opinion polls are notoriously unreliable guides to belief, especially in the context of politics. One challenge is the phenomenon of expressive belief or “cheerleading”, where someone expresses a view they do not genuinely hold in order to signal group membership and allegiance. When polls after the American presidential election of 2020 show a large portion of Republican voters (around 50–70%) accepting the statement that the election was stolen, it therefore does not follow that they all actually believe that the election was stolen. They may just cheer on their preferred leader in his campaign to sow doubt on the election results.³

Knowledge requires belief, but belief is of course not sufficient for having knowledge – for one thing, what is believed also needs to *be true*. I cannot know that MMR vaccines cause autism, no matter how strongly I believe this to be the case, since it is false that MMR vaccines cause autism. This, in turn, implies that one can only know that which *can* be true or false. Put in philosophical terms, to be knowable, a content has to be *truth evaluable*. This too causes complications since it is philosophically controversial exactly which of our statements or mental states have such contents. This holds in particular for value statements such as “Lying is wrong”, “Economic inequality should be counteracted”, or “Bach was a great composer”. According to some philosophers, expressions of value are not factual statements, but more akin to things like screaming “Ouch!” – they express emotions but do not describe the world. On a psychological level, this would mean that value expressions do not express beliefs and therefore are not

even candidates for being the result of knowledge resistance. On a metaphysical level, such expressivism amounts to rejecting the idea that there are any value facts, such as moral or aesthetic facts.

But even if there are value facts, the relation between *normative* or value judgments and other (non-normative or *descriptive*) statements is complicated, to say the least. If someone doubts that Bach indeed was a great composer, it might just be possible to argue for that claim on the basis of the *purely descriptive* characteristics of his music. But if someone holds that killing a person is always morally wrong, it is at least much harder to see how any empirical data or descriptive facts would even be relevant. Such a statement might express a normative truth that holds irrespective of all the empirical or descriptive facts. Consequently, even if value judgements have truth evaluable contents and express beliefs, it would still not be clear whether they are candidates for knowledge resistance. Whether or not there are value facts, that is, value judgements just might not be such that empirical evidence is relevant to them.

This is important to remember when assessing the empirical literature on knowledge resistance and various types of emotion-driven attitudes, since some of the experiments concern policy attitudes and these always involve values. The complication is that such experiments invariably provide subjects with (made up) empirical data. But if evidence is irrelevant to value judgments, then it is perfectly possible to accept *all* the relevant known empirical facts and yet reject a proposed policy without being irrational. Thus, one might accept that stricter gun control laws decrease deadly violence and yet reject such laws because one values the right to freely carry guns more than a decrease in deadly violence. This would not mean that empirical knowledge is *irrelevant* to policy decisions; given that we have certain goals (such as reducing deadly violence), we will always need empirical knowledge about how best to reach a given goal. But the question whether this is a goal worth having might not be one to which empirical evidence is relevant.

Unfortunately, these questions concerning the nature of value judgements can seriously complicate the interpretation of experimental results. A famous example of such an experiment concerns people's attitudes toward the death penalty (Lord et al., 1979). When people with partisan attitudes toward the death penalty were shown a scientific article concerning the link between capital punishment and crime, this did not affect their attitudes: those who were against the death penalty were not moved by (made up) evidence that it decreases crime, while those who were in favor were not moved by evidence that it does not decrease crime. This could be because people did not draw proper conclusions from the presented evidence, and thus a result of knowledge resistance, but it could also be because their attitudes rest on value judgments that are not influenced by empirical statements.⁴ If you hold that it is always wrong to kill a person, then you will be against the death penalty no matter the empirical evidence.

Some experimental work on policy attitudes suggests that people do treat policy questions as amenable to factual or empirical arguments (whether or not this is philosophically the right position to take). Thus, in a study by Taber

and Lodge (2006), US college students were first asked for their attitudes on affirmative action and gun control, and then to study or rate the strength of various arguments for and against these policies. Among other things, the study provides support for what Taber and Lodge call *disconfirmation bias*: people actively seek out attitudinally incongruent evidence in order to counterargue it. Moreover, this was more pronounced in politically knowledgeable subjects. It should be noted though that the participants were told that they would have to present the debate in an objective manner to other students and that they were explicitly asked to concentrate on what made the arguments weak or strong, and to leave their feelings aside, all of which would have primed them to think of the policy questions as empirical or factual questions. Indeed, as Taber and Lodge note, despite these instructions, a good number of the participants made “simple content-free affective statements... to the effect ‘I like (don’t like) this argument or conclusion’” (2006, p. 763).

Given these complications, experiments on knowledge resistance should be focused on judgments that are clearly factual, and whose truth can be investigated by scientific methods. Moreover, it is advisable to stay away from matters of fact where there is genuine uncertainty about the truth of the statement, and stick to cases where there is expert agreement. This, largely, is also how experimental research on knowledge resistance has been carried out. No doubt, certainty is hard to reach, and on occasion, there has been scientific consensus on something that later turned out to be false, but these cases are the exception and the difficulties separating that which we have very strong evidence to believe is true from that which is not should not be exaggerated – indeed, exaggerating these difficulties is precisely one of the tools used by those who want to stop people from accepting inconvenient truths, for instance about smoking causing cancer or about climate change (Oreskes & Conway, 2010). Nor should complex questions be avoided; being complex might make a question initially harder to answer but has nothing to do with whether it is empirical or not. Moreover, many of the questions concerning which there appears to be resistance are of precisely this sort: they are complex, but entirely empirical. After listing some of these – Does burning fossil fuels contribute to global warming? Does permitting citizens to carry concealed weapons increase homicide rates? Does vaccination against the human papillomavirus lead to more unprotected sex? – and stressing their empirical nature, Kahan thus points out that “[i]ntense and often rancorous conflict on these issues persists despite the availability of compelling and widely accessible empirical evidence” (2017, p. 55; see also Kahan, 2016a, p. 1).

Not everyone seems to agree. Klintman (2019) used considerations of complexity to argue that we need to distinguish knowledge resistance from fact resistance. According to Klintman, talking about fact resistance implies that we are concerned with a simple black-and-white phenomenon – clear and indisputable fact – whereas to speak in terms of knowledge resistance is to conceive of the phenomenon as multifaceted, more profound and less categorical (2019, pp. 17–20). As an example of fact resistance, he mentions resistance to unambiguous facts about the prevention of HIV, and as an example of knowledge resistance,

he mentions beliefs about the risks of genetic engineering and about immigration and crime. But to support the distinction, he does not appeal to complexity, but rather to the idea that knowledge is more than just facts: “[K]nowledge comes in different shapes and colours: through systematic laboratory experiments and modelling, but also through daily experiences” (Klintman, 2019, p. 23). From a philosophical point of view, however, it is hard to see the point of this. No doubt, we need to distinguish facts, states of the world, from knowledge of these facts. Knowledge requires true beliefs, facts do not, and there are countless facts that we will never have knowledge of. But this has nothing to do with complexity. It holds for simple questions (or facts) as well as for complex ones.⁵ Similarly, evidence clearly can come from very different sources, but that by itself amounts to no more than a distinction between precisely that: sources of evidence. It provides no reason for thinking that we cannot usefully identify a general type of phenomenon here: knowledge resistance as precisely resistance to available empirical evidence – regardless of whether this evidence is supplied by laboratory experiments or some other method.

This takes us to a third necessary condition on knowledge, in addition to the two identified above: *justification*. As stressed by philosophers since Plato, we need to distinguish between a lucky guess and knowledge, and the distinction hinges on the idea that when someone knows that *p*, then the belief that *p* is not only true but also justified, based on evidence or good reasons.⁶ The resistance part of knowledge resistance concerns this third component, more precisely, it concerns how people respond to evidence. Justification requires the drawing of proper conclusions from the available evidence. Resisting it thus prevents us from acquiring knowledge – belief formed in knowledge resistant ways is not justified and thus cannot be knowledge.

Evidence

In ordinary parlance, “evidence” is used in a variety of ways. For instance, objects and events such as bloody fingerprints, murder weapons, smoking guns, or explosions may be described as evidence. However, in the context of knowledge resistance, it is useful to construe evidence as *propositional*, not *objectual*.⁷ What we are interested in are relations between two propositions, for instance *that there are bloody fingerprints in the butler’s pantry* and *that the butler is the murderer*. The first provides “support” for the second, support of a kind often characterized as *inferential support*: If you (justifiedly) believe the first proposition, you have (a certain degree of) support, or justification, for inferring the second proposition from it. Since such an inference is not a deductive inference, and the truth of the first proposition does not guarantee that of the second, this notion of the support empirical evidence provides is quite naturally understood in terms of probabilification: If the evidence-proposition is true, then it is more likely that the proposition it is evidence for is true, too.⁸

In the case of human knowledge, there are two fundamental forms of empirical evidence. First, there is experiential evidence, provided by our senses, such

as visual, auditory, or tactual evidence. How do I know that there is a tree in my garden? I see it. How do I know that a plane just flew by? I heard it. Experiential evidence plays a central role in how we navigate our daily lives, but what is distinctive of human knowledge is the extent to which we also rely on a different type of evidence, provided by the testimony of other people. How do I know what you did yesterday? You told me. How do I know that Biden is the current president of the US? I read it in the New York Times. How do I know that global warming is caused by carbon emissions? I listened to a climate researcher. When it comes to scientific knowledge, for instance, we largely acquire this through testimony (even the scientists themselves do their work on the basis of a large body of knowledge acquired through testimony). The same holds for knowledge about current events and society, knowledge of the sort that is relevant to our tasks as voters in a democracy – it is largely testimonial, and it is, to a large extent, provided by media of various sorts.

An important consequence of this is that human knowledge relies on *trust*. If I do not trust what you say, I won't believe it, and unless I believe it, I won't acquire the knowledge that you make available to me. The central role of trust in human knowledge makes for a certain type of vulnerability, relating to misplaced trust and distrust. Distrusting reliable sources means missing out on available knowledge. The type of ignorance that ensues is a lack of belief about a certain matter. If, instead, trust is misplaced and one trusts unreliable sources, the resulting ignorance involves having a false and/or unjustified belief about the relevant matter.⁹ A central question, therefore, is how to determine the trustworthiness of a source. In a high-choice information environment, where there is great variation in reliability, the question becomes more acute and more challenging, demanding more of the individual than in an environment where the choices are fewer and the sources more reliable. A particular challenge concerns expert testimony, since it is in the nature of expert knowledge that non-experts often have difficulties making an independent evaluation of the plausibility of what the experts say. If you tell me that there is an elephant in the living room, I am able to determine that I probably should not trust your statement (not on this occasion at least), but when it comes to scientific statements my strategy will have to be more indirect, relying on institutional criteria of expertise (for instance, I could investigate the professional qualifications of the person). Also, in the case of disciplines where there is a direct connection with technology, these produce many statements that can be evaluated by laypersons (airplanes fly, cars drive, computers calculate, medicines heal), which provide a form of indirect test of the veracity of the science.¹⁰ Nevertheless, trust in expert knowledge is particularly vulnerable since it can be undermined simply by sowing doubt about the messenger, without any independent means of checking the message. In the light of this, it is unsurprising that the reason most often cited in support of different types of science denial (be it about vaccines, the climate, or GMOs) is a certain type of conspiracy theory about the scientists (Lewandowsky et al., 2013).

Knowledge resistance mostly appears to involve resistance to testimonial evidence, not experiential evidence. One reason for this is that it often seems to

involve politically charged issues where relevant knowledge – such as scientific knowledge or knowledge about society – is typically acquired on the basis of testimony. Our focus will therefore be on testimonial evidence.¹¹

As we said above, we take the notion of evidence relevant to the resistance phenomena to be propositional. This means that evidential relations hold among propositions. We also suggested to adopt the quite natural understanding of the evidential support provided by empirical evidence in terms of probabilification. For these reasons, it is important to say something about the kind, or *form*, of proposition relevant here. Can we say anything general about what it is the various sources of empirical evidence “say”?

There is of course a huge variety of sources providing testimonial evidence. The kinds of things they can “say” (be it by means of speech, text, or image) and thereby provide evidence for are, if anything, even more varied. Nevertheless, we can think about the form testimonial evidence takes via the structure of the justification it provides.¹² If the source is knowledgeable and trustworthy, a recipient can acquire knowledge from the source. This is because their saying that *p* is a good indicator of *p*’s truth. But if the source is unreliable, this is not the case. The evidence therefore needs to be of a form that makes its evidential power dependent on the source’s reliability: if it is true and the source is reliable, the truth of what the source says is more likely, but if the source is unreliable, it is not (or at least less so). To capture this structure, we suggest construing testimonial evidence as being of the form *S says that p*, where *S* can be any source that provides information – be it via speech, text, or images. On this construal, *what a source says* is not to be identified with the evidence – rather, what they say is what they provide evidence *for* by saying it (if sufficiently reliable). Thus, a reliable scientist NN’s assertion that global warming is caused by burning fossil fuels provides testimonial evidence with the content *NN says that global warming is caused by burning fossil fuels*. What it is evidence for is *that global warming is caused by burning fossil fuels*.

When it comes to epistemic justification, however, we are not simply interested in relations between propositions, but also in people’s *relation* to the evidence, which is to say that we are interested in their psychological states. To go back to our murder mystery: imagine that you in the meantime have learned that the lord faked his alibi because he was with his lover and that DNA traces from the butler have been found under the victim’s fingernails. Now you have much stronger evidence for the belief that the butler did it. At this point, your long-time partner falls ill and you get a new assistant, DC Sally Sleuth. Sleuth hasn’t seen, or heard of, any of the evidence you have uncovered, but she believes that the butler did it simply because she dislikes him. *Her* belief is just as true as yours, but if Sleuth indeed formed it without *having* any evidence, then her belief is not justified.¹³

How does this play out in the context of knowledge resistance? Does knowledge resistance only concern resistance to evidence that the subject *has*? Clearly, it cannot be that we are knowledge resistant simply because we are unaware of evidence. In that case, every one of us would be radically knowledge resistant all

the time. At the same time, requiring possession of the evidence in the sense of belief might be too strong: some of the pertinent cases seem to involve *avoidance* of evidence. If I know that I can find out whether the butler did it by looking in his pantry, but I decide not to look because I do not want to believe he did it, then I'm plausibly resisting knowledge, even if my belief formation as such is not irrational. Similarly, if I suspect that Trump has done some not-so-great things, and I avoid reading the New York Times since I think they write about this, then I'm plausibly resisting knowledge. In order to characterize these cases as a form of knowledge resistance, we will need to understand the notion of available evidence to not only include all the evidence a subject has, but to be wider than that. In particular, we will need to say more about what it means to avoid available evidence. We shall return to this rather difficult question below. First, however, we shall focus on cases where the subject has the evidence.

Rationality, Irrationality, and Motivated Reasoning

Knowledge resistance involves an irrational response to evidence. But we are not interested in just any instance or pattern of irrational belief formation. We are not interested in occasional miscalculations, for instance. Nor in systematic ones due to nothing but cognitive limitation. What we are interested in are patterns of irrationality that are the result of certain kinds of psychological mechanisms, mechanisms different from rational information processing in ways that invite describing these mechanisms in terms of resistance. A prime candidate for such a mechanism is what psychologists call *motivated reasoning*.

Motivated reasoning is belief formation improperly driven by what philosophers call "desire", meaning any kind of wish, want, urge, hope, or other "pro-attitude" regarding a proposition's truth. That is, it is belief formation driven by desire *rather than* by epistemic reasons. Motivated reasoning has been investigated by social psychologists since the 1950s (for an overview, see Kunda, 1990). A common description of the phenomenon is that it involves believing what one *wants* to believe, rather than what one has good reasons to believe. However, this description is not unproblematic since it construes belief as a kind of action, one that is under the control of the will, a position philosophers call *doxastic voluntarism*. There are strong empirical reasons to believe that doxastic voluntarism is false and that the kind of control we have over our beliefs is, at most, indirect (Alston, 1988). I can no more get myself to believe that global warming is a hoax than I can get myself to believe that 2 plus 2 equals 5 – no matter how much money you offer to pay me for forming either of those beliefs. (I could, however, try to totally immerse myself in the world of climate deniers and perhaps that would eventually lead me to become a skeptic.) Indeed, as has been noted in the literature on motivated reasoning, people do employ various indirect strategies to protect desired beliefs, strategies utilizing the fact that the best way to influence beliefs is through arguments and evidence. Kunda writes: "I propose that people motivated to arrive at a particular conclusion attempt to be rational and to construct a justification of their desired conclusion that would

persuade a dispassionate observer” (1990, p. 84). A useful, less voluntaristic characterization of motivated reasoning is provided by Kahan, who defines it as “the tendency of individuals to unconsciously conform their assessment of information to some goal collateral to assessing its truth” (Kahan, 2016a, p. 2). These collateral goals are often called “directional goals”. And it is important here that the tendency to conform one’s judgement to a directional goal is supposed to be *caused and explained* by having the directional goal.

Understanding the irrationality of motivated reasoning relevant to knowledge resistance requires reflecting on how it relates to the rationality of action. On the standard construal, the rationality of action depends on two components: belief and desire (or pro-attitude). If I want another beer, and I believe there is beer in the fridge, then I have a reason to go to the fridge. (Of course, such a reason might be overridden by others – I might, for instance, plan to drive later.) This type of rationality is sometimes called *practical* rationality, since it leads to action (or at least to intentions to act), and reasons for action are called practical reasons. It’s been much discussed in philosophy whether there can be practical reasons for belief, whether it can ever be rational to form a belief because one desires to do so (for overviews, see Marušić, 2011; Reisner, 2018). But even if one accepts that belief can be practically rational, it is important to distinguish practical rationality from *theoretical or epistemic* rationality. Theoretical rationality concerns the epistemic basis of belief, the extent to which it is based on evidence, and wishful thinking will always be epistemically irrational – regardless of whether it could be described as practically rational. The distinction is of some importance to the discussion of motivated reasoning. Thus, Kahan has suggested that it can be rational for an individual to hold on to beliefs that have become symbols of membership in what he calls “identity-defining affinity groups” (Kahan, 2016a, p. 2): groups central to an individual’s social identity. According to Kahan, this can be rational even in the face of strong counterevidence, because for someone getting “the ‘wrong answer’ in relation to the one that is expected of members of his or her affinity group, the impact could be devastating: loss of trust among peers, stigmatization within his community, and even loss of economic opportunities” (Kahan et al., 2017, p. 57). Thus, for conservatives in certain parts of the US, it may be important to endorse climate skepticism. But even if one accepts the idea that motivated belief can be practically rational, it is important to stress that in the epistemic sense, it would nevertheless be irrational. And that is what matters from the point of view of knowledge resistance.¹⁴

The relevant notion of rationality, therefore, is epistemic rationality. This, in turn, can be understood according to different models. The most commonly used is Bayesianism. Bayesianism is a simple and natural way of using the idea that empirical evidence can be understood in terms of probabilification to model the epistemic rationality of updating a belief system on the basis of new information.¹⁵ Bayesianism models a belief system as a space of propositions over which a probability function distributes its values. These values, conventionally set to range between 0 and 1, model a subject’s credences or “subjective probabilities”,

i.e. the degrees to which they hold the propositions true. These degrees can be very high (1 - outright belief) or very low (0 - outright disbelief), but the subject might also find some things more or less likely, without being certain. Using a probability function to model credences places rationality or coherence constraints on them – such functions for instance require that the credences for p and not- p add up to 1. The function also assigns conditional probabilities: probabilities of one thing being true given the truth of some (other) thing. These answer questions like: how likely is it that there is fire if there is smoke? How likely is it that the butler is the murderer if there are bloody fingerprints in his pantry? Or: how likely is it that consuming GMOs is detrimental to your health if a certain new age guru says that it is? Now, assuming that we have our probability function P_o in place for a given belief system, we can use it to model how to rationally update that system in the light of new information. Updating will result in a new probability function P_n that models the updated system. For getting from P_o to P_n , Bayesianism uses a rule called *Bayesian conditionalization*. It tells you that when updating on new information p , the updated credence or probability assigned to a proposition q should be identical to the old conditional probability of q given p .¹⁶

$$(BC) P_n = P_o(q | p)$$

To illustrate: at the very beginning of the case of the manor murder, you may think that it is as likely as not that it was the butler, but would go up to, say, 70% should you find bloody fingerprints in his pantry. Then, you do find bloody fingerprints in the pantry. Bayesian conditionalization tells you to now update your credence in the butler's being the murderer from 0.5 to 0.7.¹⁷

As you can see, a lot hinges on the credences you start your investigation with. These are called your *priors*. Given that you are an experienced detective and already have a long and relevant information history, you might come to the case thinking that in cases of this sort, it more often than not is the butler. Your prior would then be larger than 0.5. And this might even be reasonable. But now think of Sally Sleuth again. She formed her belief that the butler did it on the basis of her dislike for him, which on the face of it sounds like a clear case of motivated reasoning. But there is a wrinkle. Imagine that Sleuth comes to the case with a high prior on its being the butler if she dislikes him. She might, for instance, think of her butler-dislikes as some sort of indicator of their being murderers. She might even have already investigated quite a number of manor murder cases where butlers were the culprits precisely when she found them unsympathetic. Upon meeting the present butler, she finds that she does dislike him and updates accordingly. In this case, Sleuth's belief formation, even though there might well be something improper about it, is *not* a case of motivated reasoning. Rather, she updates her beliefs in a way that not only is in accordance with Bayesian updating, but indeed exhibits a certain internal rationality. Given that she thinks that her butler dislikes in fact indicate whether they are murderers, it makes a certain sort of subjective sense that she comes to believe the

present butler to be one. What might be irrational here, if anything, it is Sleuth's prior belief about her dislikes, not the way she updates.

This illustrates that using Bayesianism to model *subjective* probabilities, or credences, and how to update them in the light of new information provides us with a notion of rationality that, in a certain sense, is subjective, too: it first and foremost tells us how to rationally update a *given* belief system, i.e. a subject's *actual take* on the world – including on what in fact makes what more likely. And a given belief system might be more or less in line with how the world actually is. Thus, even though an update might initially strike us as simply unreasonable, it might not be unreasonable through and through, given a subject's prior beliefs. And while those priors themselves might have been arrived at in improper ways, locating the irrationality, if any, would in many cases require more and deeper knowledge. In particular, we would need to know more about the subject's *information history*. In Sleuth's case, it is unlikely that her belief about her dislikes has been formed in a proper way, but in many other, more realistic cases, it is far less easy to tell to what degree a subject's prior beliefs are justified by their information histories and, if not, where exactly the irrationality is located.

When it comes to motivated reasoning, what is important is that here, directional goals play an improper role in the updating process itself. Psychological research on the nature of motivated reasoning suggests that a variety of mechanisms are involved (Kunda, 1990, pp. 84–102). It can be a matter of biased memory search, where people search for beliefs that support the desired conclusion, accessing only part of their relevant beliefs. Directional goals can also influence the speed of reasoning and lead to skewed weighing of evidence, biased selection of inference rules and statistical heuristics, or biased evaluation of the methodological aspects of scientific studies or of the quality of expertise. There are however well-known experimental challenges when it comes to studying these processes. One central challenge is to *determine* whether the reasoning is indeed driven by directional goals or whether it can be explained in non-motivational terms, by appealing to prior beliefs and expectancies.¹⁸ When it comes to resisting testimonial evidence a subject has, prior beliefs about, or other considerations relevant to, the *reliability of the source* of the evidence become particularly interesting. If I am not sensitive to source *S*'s telling me that *p*, this may indeed be because I'm engaged in motivated reasoning, but it could also be because I believe *S* to be unreliable or because my prior beliefs give me reason to think that *p* must be false (which in turn will influence my belief in *S*'s reliability). Both of these beliefs might themselves have been formed in improper ways, of course, but again, the impropriety would in that case lie somewhere in my information history, not in the particular updating process under investigation.

When it comes to the psychological sources of motivated reasoning in general, one can desire to protect, or resist, a belief as a result of any number of psychological factors – be it emotions such as fear, character traits such as vanity, or a wish to fit in with the group. For core cases of knowledge resistance, however, certain types of sources appear to be typical. In a discussion of science denial, Hornsey and Fielding (2017) suggested that there are six different types

of sources, what they call “attitude roots”, underlying motivated reasoning. Among these are vested interests, fears and phobias, personal identity expression, and social identity needs.

Especially social identity needs have come to play a prominent role in research on a form of motivated reasoning of particular interest: *politically* motivated reasoning. Politically motivated reasoning is often considered to be the main explanation for the phenomenon of *fact polarization* (Kahan, 2016a, 2016b). In Kahan’s words, fact polarization is “intense, persistent partisan contestation over facts that admit of scientific evidence” (Kahan, 2016b, p. 1). In cases where the relevant scientific evidence is clear, univocal, and readily available, fact polarization appears to be a prime location at which to find knowledge resistance. We have already touched upon Kahan’s influential idea that subjects’ identity protection needs provide motivation for resisting evidence against beliefs that have become symbols of membership in identity-defining social groups. For partisans, such groups are political, but the relevant beliefs are factual. They are beliefs admitting of scientific evidence, beliefs about the causes of global warming, vaccine safety, or the effects of GMOs on human health, for instance. Kahan and his group have not only carried out a number of important experimental studies investigating people’s reactions to evidence regarding various such issues; they have also carefully calibrated their experimental designs to the detection of political motivation, in particular as distinguished from confirmation bias (Kahan, 2016a, pp. 1–4). Nevertheless, not even Kahan’s designs would seem to escape an important confound.

Tappin et al. (2020a, 2020b) point out that experiments for the detection of politically motivated reasoning typically are of one of two kinds. What is relevant here are those they call “outcome switching” designs. Such experiments use subjects’ evaluation or endorsement of new information as their outcome variable. The subjects are randomly assigned one of two pieces of information, the substantive detail of which is held constant across conditions. But the implications this information has for subjects’ political identities vary between conditions: in one condition, the information is identity-incongruent, in the other it is congruent. “The key result is that subjects’ evaluation of the information differs by condition, and, in particular, that this difference is correlated with their political identities or preferences” (Tappin et al., 2020a, p. 82). But people’s political identities are often also correlated with their *prior beliefs* about the relevant issue. Switching the treatment information to render it incongruent with political identity and motivation *also* renders it incongruent with prior belief. And, as we illustrated above, prior belief can influence people’s reasoning in the absence of political motivation. This does *not* mean that what is observed in outcome switching experiments in fact is not politically motivated reasoning. But it does mean that experiments of this kind do not allow us to tell it apart from reasoning explained by prior belief: “[T]he effect of prior belief (...) confounds inferences of political motivation in this design” (Tappin et al., 2020a, p. 83). Ditto et al. called this “an empirical catch-22 at the heart of all research on motivated reasoning” (2019 p. 285).

Even experiments in which subjects appear to adjust their estimate of the reliability of a source of evidence in response to whether what the source says is in line with their prior beliefs can be confounded in this way. As we said above, what someone says can be an indicator of their reliability. If you, for instance, are presented with a source described as having all the credentials of an expert climate scientist, but also as saying that global warming is a hoax, you have very good reason to doubt their reliability. Doing so both appears reasonable and is fully in line with Bayesianism (cf. Hahn & Harris, 2014; Tappin et al., 2020b).

All in all, it seems fair to say that the detection of politically motivated reasoning faces important challenges that have not entirely been resolved to date.

A Wider Notion of Knowledge Resistance?

The difficulties of disentangling the effects of motivation from those of prior belief also raise the question of how wide the notion of knowledge resistance should be construed. There are at least two issues worth considering here, both of which have to do with a subject's information history. The first concerns updating on evidence the subject has but that is in fact explained by prior belief – where that prior belief itself results from irrational formation, in particular from misplaced trust. Such trust might be ungrounded, for instance because it is politically motivated.¹⁹ We tend to think that cases of this kind are usefully included under the notion of knowledge resistance. However, we also tend to think that it might be useful to distinguish between a narrow and a wider sense of knowledge resistance in order not to lose track of the difference.

The second issue concerns cases where the subject does *not* have the evidence because of certain features of their information environment.²⁰ As we already said above, we think that some cases of this kind are usefully counted as knowledge resistance. Care needs to be taken, however, to avoid including cases where people, due to no fault of their own, just have had the bad luck of ending up in highly unreliable information environments. Take, for instance, a person growing up in a fundamentalist sect. Such a person might develop a system of fundamentalist belief that is both subjectively rational and results from rational responses to all the evidence available to them. (Baurmann, 2007 provided useful discussion and suggested how to model such a development.) We might not want to count such a subject as knowledge resistant.

Fundamentalist conditions are rare, however. More often than not, subjects have quite a bit of control over which sources they get information from. Thus, ignorance might be the result of what media researchers call “selective exposure”: active selection and/or avoidance of certain sources of information. We might therefore want to allow for a second kind of knowledge resistance in the wider sense: this kind involves resisting evidence a subject easily could have had but chose to actively avoid.

Exploring the wider notion of knowledge resistance further would take us too far afield, however. We would like to round off our considerations by mentioning just two of the issues in need of exploration here, both concerning news

avoidance. One concerns irrationality: a subject's habits of news avoidance could, for instance, result in ignorance of the fact that CISA said that the 2020 US election was fair. This could, in turn, be the result of an ungrounded, epistemically irrational belief as to what sources can be trusted. But what if my news avoidance results from nothing but my desire for entertainment? Should the resulting ignorance nevertheless count as knowledge resistance? We tend to think not, if only to keep the notion usefully sharp, but the question requires more discussion than we can provide here.

The other issue concerns detection again. The challenge here is to separate failures to take in available evidence that are usefully described as resistance from those that derive from limitations such as limitations of time and attention. In a high-choice, high-traffic information environment, there will inevitably be limits to what we can attend to. Ignorance resulting from these ought not to be counted as knowledge resistance, at least not automatically.²¹

Conclusion

In this chapter, we have provided a characterization of knowledge resistance in terms of resistance to available evidence and a philosophical guide to the concepts most central to the empirical investigation of such resistance: knowledge, evidence, and rationality. Starting from the long-established idea that knowledge requires true, justified belief, we have emphasized the importance of focusing the study of knowledge resistance on clearly factual judgements the truth of which can be investigated by empirical methods. Utilizing standard tools of epistemology, we have worked with an understanding of evidence in terms of probabilification. Highlighting the fact that in the central cases of knowledge resistance, the evidence is testimonial in nature, we have also proposed a specific understanding of the content of this evidence.

A central idea in our chapter is that knowledge resistance always involves irrationality, and we have discussed how this is to be understood. The relevant notion of rationality is that of belief rather than that of action. More precisely, we have suggested to characterize knowledge resistance as requiring epistemic irrationality. A central psychological mechanism resulting in such irrationality is motivated reasoning, involving belief formation driven by directional goals and desires rather than by epistemic reasons, and especially politically motivated reasoning has been suggested as the main explanation of the phenomenon of fact polarization. We have discussed challenges to the experimental detection of motivated reasoning, stressing in particular the potentially rationalizing role of prior belief in explanations of people's reactions to evidence. When priors line up with political motivations, these two factors are difficult to disentangle. This calls for caution, also outside the experimental situation: In a politically polarized media landscape, people may polarize on their factual beliefs simply as a result of differences in their prior beliefs.

Even so, irrationality might be involved in such polarization – it might just be located upstream of people's reactions to evidence, so to speak. It might, for

instance, take the form of unjustified beliefs about which sources of testimonial evidence are trustworthy. We have therefore proposed to distinguish between knowledge resistance in a narrow sense, involving an epistemically irrational response to evidence that is available in the sense of the subject's having it, and knowledge resistance in a wider sense. In the wider sense, knowledge resistance can also result from things such as avoidance of easily available evidence or irrational trust in, or distrust of, the sources of such evidence. We end by noting that this wider notion comes with its own detection challenges and requires further exploration.

Notes

- 1 Work on this chapter was supported by The Bank of Sweden Tercentenary Foundation (Riksbankens Jubileumsfond) through the program "Knowledge Resistance: Causes, Consequences, and Cures" (RJ M18-0310:1). Parts of the material are based on joint work with Levi Spectre. We would like to express our special gratitude to him, as well as to Peter Pagin, for their longstanding support of this project and all their work, comments, and discussion regarding the topics of this chapter. Thanks also to all the members of our program for comments and discussion at our workshops. Special thanks to Jesper Strömbäck for reading a draft, and to Alexander Stathopoulos for help with formatting and references.
- 2 Nor would it have been knowledge resistance to refrain from drawing the conclusion that it was the butler before you found out about the lord's motive and false alibi – on the contrary, that again would have been the wise thing as the evidence available to you at that time was just not sufficiently strong yet.
- 3 For more on cheerleading, see, for instance, Bullock and Lenz (2019) and Badger (2020). Another phenomenon that might be relevant here is *choice blindness*. In choice blindness experiments, a surprisingly large number of participants seem to have little or no commitment to what they claim to believe in opinion polls. Using manipulated forms, researchers in such experiments manage to convince around 50 percent of interviewees of having expressed a view very different from what they actually stated it to be. Moreover, these individuals subsequently are willing to provide arguments for the new view, and the attitude change (if that's what it is) seems to last over time (Strandberg et al., 2018).
- 4 There is a twist here, since the initial attitudes of the participants in the experiments actually were *strengthened* when they were presented with counter-attitudinal evidence. However, this is plausibly explained not as a (perverse) inference but as an emotional reaction to attempts to dislodge their deeply held attitude.
- 5 No doubt, some facts are fairly simple (facts about what there is in my fridge, for instance), whereas others are incredibly complex (such as facts about the causes of global warming). But there are no sharp distinctions to be drawn here, and the history of philosophy is littered with abandoned attempts at separating simple facts from complex ones.
- 6 Since Gettier's (1963) famous paper on the topic, it's been much debated whether these three necessary conditions are also sufficient for knowledge. Gettier showed that there may be situations in which one has a true, justified belief but where intuition tells us that the belief does not qualify as knowledge since the justification in question is only accidentally related to the truth of the belief (as when one happens to look at a clock at 11.35 that in fact has stopped at 11.35 but which one has every reason to think is working). However, discussing the nature of knowledge resistance does not require settling the issue of whether the three conditions are jointly sufficient, it is enough that they are necessary.

- 7 Like Williamson (2000), we tend to think that evidence in general should be construed as propositional, but this is controversial (see Kelly, 2016 for an overview and discussion; for our view, see Glüer & Wikforss, 2018). We also tend to think that evidential support should be construed as an objective relation, obtaining between propositions regardless of our take on them, but this is controversial, too (see Glüer & Wikforss, 2013, esp. Section 3).
- 8 Thinking of evidential support in terms of probabilification is a natural and very prominent way of understanding the notion with respect to empirical evidence, and we shall adopt this understanding here. For a survey, see Kelly (2016). The basic idea is that one (empirical) proposition p provides evidential support for another empirical proposition q if the truth of p makes that of q more likely – that is, more likely than q would have been independently of p . There are intricate questions concerning problems such as the problem of “old evidence” in the vicinity, but we can abstract from those here.
- 9 Kuklinski et al. (2000) distinguished between being uninformed (lacking the belief that p) and misinformed (wrongly believing p), but this distinction is not completely apt in this context. The person who, because of low trust, does not update her beliefs on evidence made available to her is not well described as being uninformed (after all, she has been informed by being provided with the evidence) even though the end result is the same type of ignorance – a lack of belief in a certain proposition.
- 10 For a discussion, see Baurmann (2007, pp. 153–157). Philosophers distinguish between esoteric and exoteric statements, where the former belong to the sphere of expertise and are more difficult for non-experts to evaluate and the latter are more comprehensible also to lay persons (Goldman, 2001). Notice that the pragmatic tests of scientific truth are not completely reliable since a machine may work even if the underlying scientific theory is partly incorrect (a point in case is Newtonian physics).
- 11 Some experimental work suggests that there might be resistance even to sensory evidence (see e.g. Kahan et al., 2012; Ripberger et al., 2017).
- 12 Our suggestion here, and the motivation for it, is modeled on Glüer’s account of the content and justificatory role of perceptual experiences (see e.g. Glüer, 2009, 2016). Resistance to sensory evidence, if any, could usefully be modeled on this account, too.
- 13 Of course, you then tell Sleuth what you have found. And naturally enough, she still believes that the butler did it. She might even say: “I knew it!” Of course, *that* would not be true if she initially formed it without having any evidence. Assume that she initially was not justified in forming the belief. A trickier question then is whether she *now* is justified. Philosophers distinguish between what you have justification for believing (whether you actually believe it or not – this is often, somewhat misleadingly, called “propositional justification”) and being justified in what you actually believe (“doxastic justification”). Whether you have doxastic justification for a belief is often taken to depend on whether you hold it *based* on good reasons or evidence. In Sleuth’s case, this is not clear from what we have said about her. We assume that she initially formed the belief that the butler did it without having any evidence. But whether she *now* is basing her belief on the evidence you have given her would seem to depend on what would happen if it turned out that the evidence isn’t as strong as it seems now (you might for instance learn that, shortly before the murder, the victim dragged the half-drowned butler from the pond with his bare hands). Arguably, Sleuth’s present belief is justified only if she would give it up (or at least lower her confidence in it) in such a situation.
- 14 It is sometimes suggested that all reasoning is motivated, and that the difference between the good and the bad case is that in the good case, the motive is accuracy, whereas in the bad case, the motive is a different one, such as the desire to fit in with the group (see e.g. Taber & Lodge, 2007, p. 756. Taber and Lodge (mistakenly, we

believe) ascribe the claim to Kunda, 1990). Here, we will set this idea aside, but it is worth pointing out that while empirical research does show that accuracy improves when we are motivated to pay attention or reason carefully, it does not follow that the reasoning itself is motivated – all that follows is that we perform better when we have a motivation to do so.

- 15 Bayesianism is often criticized as unrealistic and overly idealized. Here, we need to distinguish between using Bayesianism as a model of actual information processing in the human brain or as a model of what rational processing would look like. But even if we are concerned with modeling actual brain processes, it is important that to be a useful model here it is not required that human subjects consciously run through the inferences required by Bayesian updating or even know anything about the probability calculus underwriting it. All that is required is that actual processing is in sufficient conformity to the patterns of processing predicted by Bayesianism. As far as we can tell, the jury is still out on whether it does. It is noteworthy, however, that many purported counterexamples have been successfully shown to be amenable to Bayesian treatments. Literature relevant to knowledge resistance includes Cook & Lewandowsky, 2016; Hahn & Harris, 2014; Kahan, 2016a; Ripberger et al., 2017; Tappin & Gadsby, 2019.
- 16 The conditional probability of q on p in turn is determined by Bayes' theorem:

$$(BT) \quad P(q | p) = \frac{P(q) \times P(p|q)}{P(p)}$$

When updating your belief in q in the light of new evidence p , this tells you to combine (by multiplication) your prior belief in q with the likelihood of getting evidence p in case q is true, and then to normalize by dividing by the likelihood of getting that evidence regardless of whether q is true or not.

- 17 For illustration's sake, we here abstract from all the other evidence relevant to the question of who the murderer is, evidence that might make it rational to place an even higher credence on the butler, but also a lower one.
- 18 Kunda (1990) discusses this challenge and argues that several studies fail to provide unambiguous support for the role of motivation in producing biased reasoning since the biases could also have been due to the role of prior beliefs (p. 92, 97). For an excellent philosophical survey of the relevant issues and challenges, see Hahn and Harris (2014).
- 19 Baron and Jost (2019) stress the differences in media trust between Republicans and Democrats, and note that “four of the U.S. news/opinion sources that contained the highest proportion of false statements (the Rush Limbaugh Show, Glenn Beck Program, Fox News, and the Sean Hannity Show) were highly trusted by a strong majority (51%–88%) of ‘consistent conservatives’” (2019, pp. 293–294). See also Cook and Lewandowsky (2016, p. 172), for a discussion of ungrounded trust.
- 20 When it comes to political partisans, an important question concerns whether their political motivations might not only tend to correlate with prior belief, but also increasingly with more or less exclusive consumption of partisan media.
- 21 Indeed, a useful strategy to prevent people from taking up the available evidence, employed by authoritarian states, is precisely to flood the information channels with irrelevant information (cf. Wu, 2018. See also [chapter 6](#) of this volume).

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3 From Low-Choice to High-Choice Media Environments

Implications for Knowledge Resistance

*Jesper Strömbäck, Hajo Boomgaarden,
Elena Broda, Alyt Damstra, Elina Lindgren,
Yariv Tsfati and Rens Vliegthart*

Introduction

January 6, 2021 was supposed to be a celebration of the peaceful transition of power in the US. Instead, it turned out to be a day that will be inscribed in the history books. Incited by a speech by President Trump, thousands of his supporters stormed and breached the US Capitol Building in an attempt to overturn his defeat in the 2020 presidential election. Once inside, they smashed windows, looted art, damaged furniture, and stormed the offices of representatives. In the process, five people died. This was the first time since 1814 that the building was breached.

As stunned as many were by this event, it was not completely unexpected. Long before Election Day, Trump started to question the legitimacy of the upcoming election process. For example, on July 30, 2020, he wrote on Twitter that “2020 will be the most INACCURATE and FRAUDULENT Election in history” (Kiely et al., 2020). In the months that followed, Trump kept repeating similar claims, which were echoed by political allies and right-wing media. When Trump lost the election, he and his allies – including right-wing media – continued to claim that the election was rigged and that he was the actual winner. Importantly, the false claims about voter fraud were reported by mainstream news media as well. Even though they clarified that these accusations were unwarranted (before election day) or false (after election day), the result was that virtually no one could avoid hearing or reading claims about voter fraud or rigged elections.

Importantly, several post-election opinion polls showed that a majority of Republicans believed that the election had been rigged, and that Trump was illegitimately deprived of his victory (Kahn, 2020; Politi, 2020). The same holds true even one year later (Monmouth University Poll, 2021). This example illustrates not only knowledge resistance and its potentially devastating consequences – it also illustrates the role that media may play in processes of forming and maintaining knowledge resistance. After all, it was mainly through different media channels that claims about voter fraud were disseminated, and many

right-wing media actively pushed and continue to push false claims about vote rigging and election fraud.

Against this background, the purpose of this chapter is to discuss the role of media in processes facilitating knowledge resistance. In short, our analysis suggests that the transformation from low- to high-choice media environments has contributed to an increasing supply of false and misleading information and greater opportunity structures for selective exposure and attention, which, in combination with people's tendency to prefer attitude- and identity-confirming information, contributes to an increasing prevalence of misperceptions and to knowledge resistance.

Before proceeding, it should be noted that comparative research shows that the dynamics between the supply and demand side of political information are highly dependent on the country context (Aalberg & Curran, 2010; Castro et al., 2021; Esser et al., 2017; Hallin & Mancini, 2004; Humprecht et al., 2020). The national political system, media system, and citizens' orientations toward media and politics all influence the role that media may play in processes of knowledge resistance. In this chapter, we will nevertheless discuss matters on a more general level.

Media as Key Sources of Information

An important starting point is that there are only three perceptual routes to information and about the world around us: personal experiences, interpersonal communication, and media (Mutz, 1998). Out of these, media usually constitute the most important source. Most of what we know – or think we know – is based on information that has been *mediated*, that is, transmitted via some form of media (Mutz, 1998; Shehata & Strömbäck, 2014). This holds true regardless of whether we get the information directly through media, or indirectly via interpersonal communication. We seldom access the political world as it is, and even when we are affected by politics, we can seldom fully understand or assess the way politics shapes our lives on our own. We access the political world mainly through media, and we use mediated information to form perceptions of the world. These perceptions form what Nimmo and Combs (1983) called “fantasy worlds”.

Thus, to understand the development of people's knowledge, perceptions, and attitudes, mediated information is key. As noted by Zaller (1992, p. 6), “Every opinion is a marriage of information and predisposition: information to form a mental picture of the given issue, and predispositions to motivate some conclusion about it”. In that context, it does not really matter whether the information is factually correct or not. To understand the formation of (mis)perceptions and (resistance to) knowledge, we must therefore focus on the interaction between the supply of mediated information and people's exposure to and processing of it.

The Disruption of Political Information Environments

One of the most significant changes over the last decades is the transformation from low- to high-choice *political information environments*. This concept

refers to the overall supply of different kinds of political information that is “out there”, in principle available to all citizens, and how that supply is structured (Esser et al., 2012; Van Aelst et al., 2017). Beginning with the introduction of cable television, and further accelerated with the rise and increasing reach of digital and mobile media, the total supply of mediated information has exploded (Prior, 2007; Van Aelst et al., 2017). Never before has there been such an abundance of *different types of media*, ranging from mainstream news media in their traditional or digital formats to digital-born and political alternative media, infotainment, fake news sites, social media, websites, and online forums, to name a few. Never before has there been such an abundance of *media platforms*, ranging from print to broadcast to portable media such as smartphones. And never before has there been such an abundance of *media content*. In contemporary political information environments, it is hard to recall (for those who are old enough) or imagine (for those who are younger) a time when there were just a handful of television and radio channels, when these did not broadcast around the clock, when newspapers were delivered once a day, when virtually all news consumption took place at home, when there were no social media, and when phones were not just stationary but also used only to make calls with. Still, it is not that long ago. The first web browser was launched in 1994, Facebook in 2004, Twitter in 2006, and the first smartphone in 2007.

This rapid transformation has led to some fundamental changes in processes of political communication (Bennett & Pfetsch, 2018; Nielsen & Fletcher, 2020). While some of these may contribute positively to people’s understanding of politics and society, such as an increasing availability of global news and high-quality information, in this chapter, we will focus on some aspects that are relevant in the problematic context of knowledge resistance.

First, it has significantly lowered the entry barriers to the public sphere, thereby undermining the gatekeeping function of the news media (Nielsen & Fletcher, 2020; Vos & Heinderyckx, 2015). Traditionally, the news media largely decided what events and information would be turned into news and become publicly available. For those who wanted to influence the public debate, it was necessary to get access to the media, mainly by adapting to news media logic and the news media’s criteria of newsworthiness (Cook, 2005; Strömbäck & Van Aelst, 2013). This gatekeeping function was “the center of the media’s role in modern public life” (Shoemaker & Vos, 2009, p. 1). In contemporary media environments, virtually anyone can start blogs or webpages, comment on current affairs, and participate in the production or dissemination of news and other forms of media content. As a result, there is now a multiplicity of gates, meaning that “information will make it into the public sphere, regardless of actions taken by the legacy media” (Vos, 2015, p. 16). Mainstream news media still matter greatly, but instead of being the only curators of which information reaches the public, they face a situation where journalistic curation is complemented with, and in many cases replaced by, social curation, personal curation, and algorithmic curation (Thorson & Wells, 2015). Among other things, this has empowered political and other strategic actors who can now autonomously communicate with the

public. It has also empowered citizens, who can now exercise more control than ever over what they are exposed to.

Second, the transformation into high-choice media environments has enabled the rise of and empowered “alternative media”. Although this concept is ambiguous, we use it in reference to media that “represent a proclaimed and/or (self-)perceived corrective, opposing the overall tendency of public discourse emanating from what is perceived as the dominant mainstream” (Holt et al., 2019, p. 862). In contemporary societies, the concept primarily refers to partisan media, that is, media driven by political and partisan agendas who perceive and use news as a “vehicle to advancing a particular point of view” (Levendusky, 2013, p. 8). It also includes media creating and disseminating disinformation and conspiracy theories, such as “fake news sites” that provide deliberately created, pseudo-journalistic disinformation intended to mislead and deceive (Egelhofer & Lecheler, 2019; Tandoc et al., 2018).

The distinction between mainstream and alternative, partisan media is however not clear-cut. For example, some media have content that largely adheres to journalistic norms whereas other parts are highly partisan or biased. False and misleading information might further originate and be disseminated both by sources that are more or less entirely fake, and by media that blend real news and fake news. The key distinction is nevertheless whether different media seek to adhere to journalistic norms emphasizing that the information being reported should be verified, truthful, and relevant, and that news coverage should be impartial (Kovach & Rosenstiel, 2021). According to Benkler et al. (2018, pp. 77–78), to the extent that media do this, a “reality-check dynamic” evolves. Such a dynamic is characterized by media competing on truth quality and the recency of their news, and by media policing deviance from the truth by other media as well as by politicians. This policing of truth deviance is perceived both as a journalistic end in itself and as a means to gain credibility and compete for audience attention. In contrast, among media that are driven by political and partisan goals, a “propaganda feedback loop” is likely to evolve (Benkler et al., 2018, pp. 79–80). Instead of delivering truth and separating facts from opinion, such media are focused on delivering partisan- and opinion-consistent news, thereby competing by means of political identity-confirmation. And instead of policing deviance from truth, they are policing news and other information that challenge partisan narratives and frames, or “news that is not identity confirming” (Benkler et al., 2018, p. 79). Needless to say, false or misleading information is much more likely to originate from and be disseminated by partisan media (see [Table 3.1](#)).

The third important aspect of the transformation into high-choice media environments is that the use of traditional news media – not least newspapers – has declined while digital and social media have become more important (Newman et al., 2020; Shearer & Matsa, 2018; Shearer & Mitchell, 2021). This trend is particularly evident among younger age groups. (Newman et al., 2020, p. 24). This shift from traditional to digital news platforms might have profound consequences for people’s information and knowledge levels. When people get

Table 3.1 Role of Media When Reality Check Dynamics Versus Propaganda Feedback Loops Are Dominant

<i>Role of the media</i>	<i>Reality check dynamics</i>	<i>Propaganda feedback loops</i>
Goal	Provide truthful accounts	Provide partisan accounts
Fact and opinion	Separate	Blended
Compete by	Journalistic news values, freshness, and quality of the news	Partisan news values, partisan-consistent, and identity-confirming news
Relation to misinformation	Provide corrective information, criticize when others carry misinformation	Disseminates or criticizes misinformation depending on what serves partisan goals
Relation to official statistics and research findings	Treat as authoritative if not questioned by authoritative sources	Subordinate to whether they align with partisan narratives
Seek to earn trust by	Providing verified and truthful news	Providing partisan-consistent and identity-confirming news

Note. The table is inspired by Benkler et al. (2018).

the news in their *traditional formats*, they are exposed to a full newspaper or a full news show with a balance of editorially selected topics, whereas when they get the news from *online media*, they are exposed to a curated set of news stories. When people get the news from *social media*, they are in contrast mainly exposed to headlines, filtered by their respective social networks and algorithms. In most of these cases, people do not click on the links leading to the full news stories (Kümpel, 2020), meaning that the headlines might be all they see. This may nevertheless contribute to an illusion of knowing (Leonhard et al., 2020). Several studies also show that people learn less from using digital and social media compared to traditional news media (Andersen & Strömbäck, 2021; Castro et al., 2021; Shehata & Strömbäck, 2021; Van Erkel & Van Aelst, 2020). In addition, on social media, news from traditional news media is intermingling with news from partisan media, citizen media, political organizations, and fake news sites, blurring the boundaries between distinctively different types of “news”.

Also important is that the rise of digital and social media has disrupted the business models of mainstream news media, with tech giants such as Facebook and Google now receiving most of the advertising revenue that used to go to news media and fund journalistic work (Nielsen & Fletcher, 2020; Barthel, 2019). The result is a decrease in the number of employed journalists. In the US, for example, newsroom employment dropped by 47% between 2008 and 2018 (Grieco, 2020). At the same time, the remaining journalists are expected to publish on more platforms, meaning less time to focus on each news story and check the facts. The increasing financial pressure also leads to greater commercialization of news, less resources for journalistic work in general, and a greater risk that mainstream news media inadvertently spread false or misleading information.

The rise of new global tech giants has also increased the importance of personal data for the media business. Practices such as targeting and narrowcasting to sell specific audiences to advertisers are nothing new. However, a key shift is that the commodity being sold no longer is the mere attention of audiences. Instead, it has become more important to sell personal details about the audiences, including not only demographics but also their tastes, preferences, and ideologies (Turow & Couldry, 2018). This implies that it has become easier to spread misleading and false information by tailoring it to the concerns of specific audiences and then target these audiences on digital media (Jamieson, 2018).

Fourth, the transformation into high-choice media environments has resulted in much fiercer competition for audience attention. This holds for the competition between different mainstream news media as well as the competition between mainstream news media, social media, entertainment media, and alternative media. Important in this context is that the growing supply of various forms of entertainment outweighs the growing supply of news, with online media and streaming services offering an abundance of sports and entertainment around the clock. Hence, while the absolute *amount* of news has increased, the *share* of the media supply that constitutes news has shrunk and constitute just a small part of all online content (Hindman, 2009; Van Aelst et al., 2017). As a result, it has become easier both to find and to avoid news while consuming media. Indeed, research suggests that the share of news avoiders – defined as people with “low news consumption over a continuous period of time” (Skovsgaard & Andersen, 2020) – in many countries has increased (Karlsen et al., 2020; Ksiazek et al., 2010; Prior, 2007; Strömbäck et al., 2013; Toff & Kalogeropoulos, 2020). Such news avoidance might be *intentional* and due to a dislike for news, but also *unintentional* and due to a higher preference for other types of content (Skovsgaard & Andersen, 2020). This may have implications for how much and what people learn from their media use (Damstra et al., 2021). Both types of news avoidance may furthermore be related to the so-called news-finds-me perception (de Zuniga et al., 2020), referring to the idea that one does not have to actively follow the news to be well informed because news will reach a person either way, through social media or peer recommendations (de Zuniga et al., 2017).

In other words, the marketplace for attention has never been as crowded, and there are several signs that news and political information are losing this competition. This particularly holds for younger and less politically interested people, and for those who believe that they do not need to follow the news to be informed.

Increasing Prevalence of False and Misleading Information

While the structural changes described above have resulted in greater availability of high-quality journalism and information, it has also resulted in an increased supply of false and misleading information (Benkler et al., 2018; Kavanagh & Rich, 2018; McIntyre, 2018; O'Connor & Weatherall, 2019). This holds true

for *misinformation*, defined as false or misleading information without any intention to deceive, as well as for *disinformation*, defined as intentionally false and misleading information (Wardle, 2018). It also applies to *fake news*, a type of disinformation which can be defined as intentionally false or misleading information mimicking real news (Egelhofer & Lecheler, 2019). Another type is *conspiracy theories*, defined as explanations of events or circumstances that involve a group of powerful people acting in secret for their own benefit (Uscinski, 2019). Finally, there is *computational propaganda*, referring to the use of social media platforms, autonomous agents, and big data to disseminate false and misleading information for political purposes (Wooley, 2020). A key question when assessing false and misleading information is hence whether or not there is an intent to deceive. Since that is oftentimes difficult to assess, as an umbrella term, we will henceforth use misinformation.

Nowadays, virtually anyone can participate in the production and dissemination of news, which also leads to a rise in available misinformation. To begin with, people are not always knowledgeable about the things they discuss online, meaning that they may share misinformation that they think is actually true. In addition, ulterior motives may play a role. Misinformation may align with people's pre-existing beliefs and attitudes, and they might want to influence others' opinions, express their own opinions, or interact with others (Buchanan, 2020; Metzger et al., 2021). Strategic actors willing to produce and disseminate misinformation can also do so more easily than ever (Allcott & Gentzkow, 2017), leading to a situation in which misinformation is widely available on digital and social media (Guess et al., 2020; Vosoughi et al., 2018). For example, research has shown that in at least 81 countries, governments and political actors use social media to spread computational propaganda (Bradshaw et al., 2021). Tactics used include the creation of fake news websites, doctored memes or images, trolling, and using bots and human-curated accounts on social media to disseminate misinformation (Bradshaw et al., 2021; Wooley, 2020). One example is the Russian Internet Research Agency, involved in spreading misinformation during several recent elections. It is telling that, each week, Twitter's systems identify and challenge millions of accounts because they are suspected of misusing automation (Twitter, 2019).

In fact, in contemporary societies, there are virtually no major events and issues without misinformation being prevalent and spread via different media. In each case, this implies an ongoing competition for audiences' attention and belief in (mis)information between (media) actors advocating factually correct and relevant information and (media) actors disseminating misinformation.

Different Media as Disseminators of Misinformation

Being the most important source of information about politics and society in general, the media are inevitably also important for the spread of misinformation. Thus far, most research in this area has focused on social media. Allcott and Gentzkow (2017), for example, investigated the dissemination of pro-Trump

and pro-Clinton fake stories in the 2016 US election campaign. Among other things, they found that pro-Trump fake stories were shared on Facebook about 30 million times, compared with 7.6 million shares for pro-Clinton fake stories. They also found that referrals from social media accounted for a larger share of the traffic to fake news sites compared to mainstream news sites. In another study, Allcott et al. (2019) investigated the dissemination of misinformation on social media between 2015 and 2018, where misinformation was defined as stories from a list of sites previously identified as sources of false stories. Among other things, they found that in the period around the 2016 election, fake news sites received about 60% more engagement (such as likes, shares, and comments) on Facebook than the major news sites in their sample, and that even after the election, engagement with fake news sites averaged around 60 million per month. Similarly, Guess et al. (2020) found that Facebook was a key source of dissemination from what they label untrustworthy websites. In addition, research has found that fake news stories on Twitter diffuse farther and faster than truthful news items (Vosoughi et al., 2018).

At the same time, several studies suggest that the consumption of fake news is highly concentrated among some ideological groups. Guess et al. (2020), for example, found that 62% of the visits to untrustworthy websites “came from the 20 percent of Americans with the most conservative information diets” (p. 472). Similarly, in a study of Twitter, Grinberg et al. (2019) found that only 1% of the Twitter users accounted for 80% of all fake news consumption, and that only 0.1% engaged in sharing fake news sources. As in the study by Guess et al. (2020), those who shared and consumed fake news on Twitter were concentrated on the right and extreme right. This ties in with a study by Benkler et al. (2018), which shows how in the US, there is “a division between the right and the rest of the media ecosystem” (p. 73). A key difference is that while “the rest of the media ecosystem” is characterized by reality-check dynamics, the right-wing media ecosystem is characterized by propaganda feedback loops. Consequently, their findings show that “Dynamics on the right tend to reinforce partisan statements, irrespective of their truth, and to punish actors – be they media outlets or politicians and pundits – who insist on speaking truths that are inconsistent with partisan frames and narratives dominant within the ecosystem” (p. 75). This suggests that online, and particularly in right-wing partisan media, misinformation is highly prevalent. That being said, it remains an open question to what extent similar patterns apply to other countries than the US.

The role of mainstream media should however not be forgotten. Not only is traffic to and use of fake news sites much more limited than the use of mainstream news media and highly concentrated among some groups (Grinberg et al., 2019; Guess et al., 2020; Nelson & Taneja, 2018), evidence shows that at least some misinformation is rather widely circulated and believed. The conspiracy theory that the 2020 US election was rigged is just one example among many. This suggests that mainstream news media may also be a significant disseminator of misinformation (Tsfati et al., 2020). In some cases, they might cover misinformation because these stories have great news value, in other cases they allow

news sources to spread misinformation without correcting it. In further other cases, the ambition is to fact-check and correct misinformation (Graves, 2016; Tsfati et al., 2020), but by doing so, they also increase the visibility and further disseminate the misinformation. A key problem here is that repetition increases familiarity, which may lead to an increase in believability (Dechene et al., 2010). In fact, research demonstrates that this “illusory truth effect” holds also for fake news (Pennycook et al., 2018). Thus, even if the purpose of mainstream news media covering misinformation may be to debunk it, they may help to disseminate and amplify such information (Tsfati et al., 2020).

Taken together, this suggests that different media play different roles in the processes of disseminating misinformation. In this context, a distinction could be made between media functioning as *actors* versus *arenas* (Van Aelst & Walgrave, 2017). In simplified terms, when media function as arenas, they provide a stage for other actors to communicate and reach out to the public. When media function as actors, they actively select and shape what is being communicated. For example, despite their algorithms promoting certain stories, social media *mainly* function as arenas, whereas partisan media function as actors, promoting misinformation when it aligns with their partisan goals. Different media might also differ in terms of the *threshold* for publishing misinformation. For example, the threshold for disseminating misinformation on social media is very low, even though social media companies are trying to curb the flow of at least some misinformation on their platforms. In contrast, the threshold for publishing misinformation in mainstream media is much higher, as these seek to adhere to the norm that information should be verified. Finally, the potential *impact* of published information differs between media. As noted above, on Twitter, most interaction with fake news is restricted to a very small group of users, meaning that the potential impact of disinformation there is quite low. Mainstream news media reach much wider audiences, and it is well established that they can have significant cognitive, emotional, and attitudinal effects (Arendt & Matthes, 2014; Maurer, 2014; Schemer, 2014). Mainstream news media also reach beyond the confines of people highly interested and involved in politics, including the moderately aware that are usually most susceptible to media effects (Zaller, 1992). Hence, the potential impact of disinformation disseminated by mainstream news media is much higher. Beyond the direct reach, all media may also have an indirect reach through other media or through opinion leaders.

Building on this discussion, [Table 3.2](#) offers a broad framework for analyzing the role of different media types in the dissemination of misinformation, distinguishing between mainstream news media, partisan media, fake news media, and social media. It should be added that each of these categories is quite broad, implying that both the threshold for and potential impact of misinformation may vary within each category. It should also be noted that there is some overlap between the media, as information from mainstream news media, partisan media, and fake news media all may be disseminated on social media.

One takeaway from the framework in [Table 3.2](#) is that while partisan and fake news media are the main culprits in terms of creating and pushing

Table 3.2 Framework for Analyzing the Role of Different Media in the Dissemination of Misinformation

	<i>Media functioning as actor or arena</i>	<i>Threshold for misinformation</i>	<i>Potential impact of misinformation</i>
Mainstream news media	Arena	High	High
Partisan media	Actor	Medium	Medium
Fake news media	Actor	Low	Low
Social media	Arena	Low	Medium

misinformation, the impact is highest when mainstream news media report on misinformation. Of course, it also matters how successful partisan media are in terms of audience reach. Programs such as Hannity on Fox are, from this perspective, a greater problem than a fake news site with only a few users. This leads us to shift our focus from the supply side to the usage side, and to explore how people navigate current high-choice media environments.

Increasing Choice Opportunities and Changing Media Use

The disruption and transformation of political information environments has not only had profound consequences for the supply of political information. It has also had a profound impact for citizens' orientation toward and use of media, greatly expanding the opportunity structures for selective exposure (Castro et al., 2021; Prior, 2007; Skovsgaard et al., 2016).

One theoretical framework to explain the mechanisms involved is the OMA-model, which stands for *opportunities*, *motivations*, and *abilities* (Luskin, 1990; Prior, 2007). In the context of media and media use, opportunities refer to the overall supply and structure of the media environment. Motivations refer to what preferences people have in terms of using different types of media, media platforms, and media content, whereas abilities refer to their physical, cognitive, and financial capabilities and resources to use and process information from these media (Delli Carpini & Keeter, 1996; Luskin, 1990; Prior, 2007).

The key insight of this framework is however not the identification of opportunities, motivations, and abilities as “conditions that promote any particular behavior” (Luskin, 1990, p. 334), but their interaction. More specifically, the model predicts that changes with respect to opportunities will *alter* the importance of motivations and abilities (Prior, 2007). Hence, changing behavior does not necessarily mean that people have changed: it might also mean that the opportunity structures have changed, giving people greater freedom to behave in line with their intrinsic preferences and abilities.

That includes people's preference for information that confirms their already held beliefs and attitudes (Knobloch-Westerwick, 2014; Kunda, 1990; Lodge & Taber, 2013; Nickerson, 1998). As shown by previous research, people have an intrinsic tendency to prefer information that confirms rather than challenges their existing beliefs and attitudes, which influences both what information

people expose themselves to and how they process that information (Nickerson, 1998). Important to note is that this *confirmation bias* often is unconscious, meaning that people are largely unaware of how their political or other preferences influence what information they expose themselves to and how they process it (Nickerson, 1998). People may think of themselves as rational, but as noted by Kunda (1990, p. 483), such notions are often “illusionary because people do not realize that the process is biased by their goals”.

The tendency to engage in selective exposure, selective attention, and motivated reasoning depends on the person’s general or issue-specific engagement. It also depends on the extent to which a person, in a particular situation, is driven by *directional goals* (motivated to arrive at a particular conclusion) or *accuracy goals* (motivated to arrive at the correct conclusion) (Kunda, 1990). Furthermore, a preference for attitude-consistent information does not equal avoidance of attitude-discrepant information (Garrett, 2009a, 2009b; Garrett et al., 2013). People are not one-dimensional, do not have just one set of preferences, and the strength of different preferences vary. Hence, a preference for attitude-consistent information may be tempered by other preferences, such as general political interest (Arceneaux & Johnson, 2013; Prior, 2007; Skovsgaard et al., 2016). What media or information people are exposed to is, finally, not influenced by preferences alone, but also by structural, contextual, and situational factors (Haugsgjerd et al., 2021; Shehata & Strömbäck, 2011; Webster, 2014; Wonneberger et al., 2011).

The important point is that the transformation into high-choice information environments means that people’s preferences have become *more* decisive for what media they use and how they process the information stemming from these sources. The tendency to prefer attitude-consistent information is nothing new: the abundance of media and other information sources that can satisfy this tendency is. Before the rise of digital media, people could choose whether to tune into the news or not, but once they had tuned in, everyone was exposed to the same information. Now those with right-wing orientations can turn to right-wing media, those with left-wing orientations can turn to left-wing media, those who are environmentalists can turn to environmentalist media, those who think that climate change is a hoax can turn to media denying climate change, and those who believe in certain conspiracy theories can turn to various conspiratorial media, and so on. Never before have opportunity structures for selective exposure been as auspicious as today.

The result is an increasing divergence in media use and attention depending on both general preferences such as political interest, and on political preferences (Aalberg et al., 2013; Mitchell et al., 2020; Prior, 2007; Stroud, 2011; Strömbäck et al., 2013). Beginning with political *interest*, among those not interested in politics, news avoidance has become more common (Prior, 2007; Strömbäck et al., 2013; but see Karlsen et al., 2020). Research shows that these groups rely more on social media for news, and that they are less likely to pay attention to political news on social media (Bode et al., 2017; Kümpel, 2020). As a consequence, people tend to learn less from using social media for getting

the news (de Zuniga et al., 2017; Shehata & Strömbäck, 2021). Thus, while using social media might facilitate incidental news exposure (Fletcher & Nielsen, 2017), most people do not pay attention to or engage with news that they are incidentally exposed to (Kümpel, 2020; Oeldorf-Hirsch, 2018; Park & Kaye, 2020). Furthermore, those who *do* pay attention to and engage with news they are incidentally exposed to tend to be those who are more politically interested, suggesting that incidental exposure does not have a leveling effect on knowledge. Instead, a *Matthew effect* seems to be at work, meaning a widening gap between the information-rich and the information-poor (Kümpel, 2020). Importantly, research suggests that only about 13% of all links on Facebook are related to hard news (Bakshy et al., 2015), with great variation across individuals' feeds depending on, among other things, algorithms designed to provide users with as relevant information as possible based on their digital traces (Pariser, 2011).

As those incidentally exposed to news on social media tend to be less engaged with politics (Fletcher & Nielsen, 2017), they may be more vulnerable to such information when it is erroneous. Given their disinterest, they are also less likely to scrutinize information, while at the same time, the mere exposure to it may increase the likelihood that the information will be perceived as true (Dechene et al., 2010). If the information is encountered later on, even in the context of a refutation, the familiarity of the information may make it seem more credible (Lewandowsky et al., 2012).

In addition, political *preferences* have become more important predictors of what information sources people expose themselves to (Arceneaux & Johnson, 2013; Stroud, 2011). As it has become easier to find attitude-consistent news and information, some people increasingly turn to those media and information sources whose coverage is likely to confirm rather than challenge their beliefs and attitudes. This may hold particularly true for those whose social identity is closely linked to certain beliefs and attitudes (Arceneaux & Johnson, 2013; Iyengar et al., 2012; Kunda, 1990; Levendusky, 2013; Lodge & Taber, 2013; Slater et al., 2020). In the worst case, this might lead to what is sometimes called “echo chambers”, which refers to bounded, enclosed media spaces that “has the potential to both magnify the messages delivered within it and insulate them from rebuttal” (Jamieson & Cappella, 2008, p. 76). To the extent that people enclose themselves in such echo chambers, it might lead to what Sunstein (2007, p. 63) refers to as balkanization, a process where “group members move one another toward more extreme points in line with their initial tendencies”, and where different groups “will be driven increasingly apart”. In line with this, research has shown that the main effect of partisan media is not that they turn non-partisans or moderates into partisans, but that they make highly partisan individuals even more partisan and extreme (Levendusky, 2013). This suggests that *reinforcing spirals* among some groups are at work (Dahlgren et al., 2019; Slater, 2007; Slater et al., 2020). In the words of Levendusky (2013, p. 141), “Viewers watch partisan media, which polarize them. But as those same viewers become more polarized, they want to consume more partisan media, given that subjects with more extreme attitudes prefer more partisan outlets. Watching

additional partisan media in turn makes them even more polarized”. Given the notion that propaganda feedback loops are more dominant among partisan media, this might fuel misperceptions.

It should however be noted that most people do not hold such strong or extreme attitudes, and that the tendency to avoid attitude-discrepant information is not as strong as the tendency to prefer attitude-consistent information (Garrett et al., 2013). As a result, most people do not encapsulate themselves into echo chambers (Arceneaux & Johnson, 2013; Bakshy et al., 2015; Castro-Herrero et al., 2018; Dahlgren et al., 2019; Fletcher & Nielsen, 2017; Levendusky, 2013; Nelson & Webster, 2017). Instead, research shows that audiences for different media or media platforms tend to overlap and that people frequently are exposed to cross-cutting news (Castro-Herrero et al., 2018; Fletcher & Nielsen, 2017; Taneja & Webster, 2016; Webster & Ksiazek, 2012; Weeks et al., 2016). That holds in particular for politically interested individuals and in countries with strong public service broadcasting (Bos et al., 2016; Castro-Herrero et al., 2018). More generally, the largest mainstream news media tend to be used by people with different political orientations. Thereby, politically motivated selective exposure is mitigated.

However, the fact that people with different political orientations to some extent use the same media does not mean that they *interpret* the information equally. Instead, people’s predispositions and motivations influence how much they trust the media providing the information, how they process and interpret it, and the extent to which they engage in counter-arguing (Gaines et al., 2007; Kuklinski et al., 2000; Kunda, 1990; Lodge & Taber, 2013; Nickerson, 1998). Thus, different groups often interpret the same facts or what is considered facts differently depending on their predispositions. In addition, the notion that people with different partisan affiliations to some extent use the same media does not mean that they *pay attention to the same news stories or elements of particular news*. Most research on selective exposure thus far has focused on the outlet-level of analysis; however, limited selective exposure at that level of analysis does not necessarily mean limited selective exposure with respect to individual news stories. Hence, findings indicating overlapping and cross-cutting media exposure do not necessarily contradict findings that political preferences have become more important in processes of selective exposure or attention to different pieces of information or facts.

Conclusions: Implications for Knowledge Resistance

Taken together, our assessment is that the transformation into high-choice media environments has significantly facilitated knowledge resistance. Although a lack of empirical research documenting trends in the prevalence of knowledge resistance across time prohibits firm conclusions, many observers agree that it has become a more pressing problem (Kavanagh & Rich, 2018; Klintman, 2019), leading some to label our time as the “misinformation age” (O’Connor & Weatherall, 2019).

The main reason for this is not that people have changed, but that their information environments have. More specifically, our analysis suggests that the

transformation into high-choice media environments has contributed to knowledge resistance through several interconnected routes. First, it has increased the supply of partisan media and information sources as well as outright fake and conspiratorial media. Second, it has increased the prevalence of misinformation, disinformation, and fake news. Third, it has facilitated political actors' ability to bypass traditional news media and communicate directly with the public, and their communication is inherently more or less biased by their political motives. Fourth, it has weakened the traditional news media's resources for verifying information and thereby increased the risk that they will unintentionally publish misinformation. Fifth, it has become easier for people to find information – including false ones – that confirm their already held beliefs and attitudes. Algorithmic curation further increases the likelihood that people are disproportionately exposed to information congenial with their already held beliefs and attitudes. This implies an increased risk that people form their perceptions and attitudes on false or misleading information and become misinformed. Finally, it has become harder to reach groups who are misinformed with correct information, and to convince them which information to trust. In short, the transformation into high-choice information environments has resulted in an increased supply of misinformation, disinformation, and fake news, which fits seamlessly with people's tendency to prefer attitude-consistent information. This process has contributed to the prevalence of misperceptions and knowledge resistance.

Having said that, it is important to note that this transformation both interacts with and is shaped by other institutions and processes of change, whether they are technological, social, cultural, and political. Hence, neither the development nor the current situation is the same in all countries. For example, Humprecht et al. (2020) found that countries are more resilient toward online misinformation when they are characterized by low levels of political polarization and populist communication, by high levels of media trust and shared news consumption, and by strong public service broadcasting. This is important to note, as most research thus far has focused on the situation in the US, characterized by the opposite characteristics. The extent to which US findings are valid in other countries is thus largely an open question.

Even so, the general tendency seems to be that the epistemic common ground is shrinking, and that facts are increasingly treated as a matter of opinion instead of as a matter of factuality and empirical evidence. The transformation into high-choice information environments has not caused this situation, but it has greatly contributed to it.

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4 Disinformation, Misinformation, and Fake News

Understanding the Supply Side

Sophie Lecheler and Jana Laura Egelhofer

Introduction

To understand processes leading to misperceptions and knowledge resistance requires understanding the supply of disinformation, misinformation, and fake news. The reason is quite straightforward: in contemporary democracies, individual knowledge gain is highly dependent on what information is available and passes through what might be conceptualized as *information supply chains*. In most cases, citizens do not learn about politics and society by themselves. Instead, citizens mainly learn about the world around them from information that is generated by elite actors, and that is then translated by journalists or other intermediaries into news articles, TV programs, and social media posts. While this is nothing new (Lippman, 1922/1997; Mutz, 1998), in recent years, there is growing concern that these supply chains are vulnerable to disinformation, misinformation, and fake news (Bennett & Livingston, 2020).

Indeed, research shows that ever-advancing information and communication technologies make the creation and dissemination of false content, be it in the form of a fake news website or an advanced deepfake, not only easy and cheap, but also increasingly successful (Lazer et al., 2018; Silverman & Singer-Vine, 2016). What is more, novel technological opportunities to deceive are accompanied by fundamental social and political challenges that accelerate their influence. For example, political polarization has led to higher demand for inaccurate but congruent information (Van Aelst et al., 2017), while the rise of populist communication has normalized a binary vision of truth (Waisbord, 2018) and introduced formats of political communication that can only be described as post-factual relativist (Hameleers, 2020; Waisbord, 2018). All this has been aggravated by a number of global crises – most notably the COVID-19 pandemic – which has increased fears of disinformation and misinformation across the globe (Van Bavel et al., 2020).

There are thus good reasons to worry that the supply of false and misleading information, i.e. disinformation, misinformation, and “fake news”, is increasingly impacting society. It does so, naturally, through the creation of misperceptions and thus the disruption of knowledge acquisition among citizens and other actors. Such misperceptions may then form the basis for knowledge resistance.

Beyond that, however, the intense worry when it comes to disinformation has given the terms “disinformation” or “fake news” a power in themselves, which means that they are increasingly used by political actors as weapons to label and discredit legacy news media around the world. This influences media trust and the work of journalists (Guess et al., 2017), but it also changes how information stemming from those legacy media overall is processed by citizens (Anspach & Carlson, 2020).

Against this background, the purpose of this chapter¹ is to examine the research literature on both actual and perceived or assumed false information supply. The literature we discuss is both empirical and theoretical. Unfortunately – and we will come back to this – only little is yet known about the precise amount of false information that is supplied across the globe. This is partly due to a lack of access to social media data, and the complexity of understanding how information spreads in global mediated public spheres. However, it also has to do with the fact that the supply of false and misleading information is not seldom a covert and/or malicious action, meaning that the actors involved prefer to remain hidden. Even when supply can be publicly traced, as is sometimes the case with elected – in particular populist – politicians, it is still difficult to examine and measure the exact motivation behind the spread of false and misleading information. Based on the extant literature, we will nevertheless offer a suggestion of how the supply side may be viewed in communication research, and then end the chapter with suggestions for future research.

Boundaries of Disinformation, Misinformation, and Fake News

The available literature on false information in public debates is plagued by a certain terminological vagueness, and terms such as disinformation and fake news are often used interchangeably, raising questions about the academic value of these terms in the social sciences (Habgood-Coote, 2019). Indeed, both in research and public life, many terms are used to describe the phenomenon of a “faulty information supply chain” that allows for the spread of falsehoods. Definitional clarity is important, however, as consistency in common understandings of social science concepts is crucial to enable effective research as well as an effective dialogue between science and society (Bale et al., 2011; Reinemann et al., 2016). A precise definition is also important because the spread of *actual* mis- and disinformation has empowered media-critical elites to misappropriate terms such as “fake news” or “lying press” to *delegitimize* legacy media outlets. Therefore, it is imperative to differentiate between the supply of political information that is incorrect in light of (empirically) established knowledge, and the labeling of information that is perhaps incongruent with the political views of certain actors as incorrect with consequences such as political polarization and loss of media trust (Egelhofer & Lecheler, 2019; Hameleers, 2020).

Starting with the most straightforward of the terms (see [Figure 4.1](#)), *misinformation* can be defined as incorrect or misleading information (HLEG, 2018). Importantly, misinformation can be disseminated unintentionally, for example,

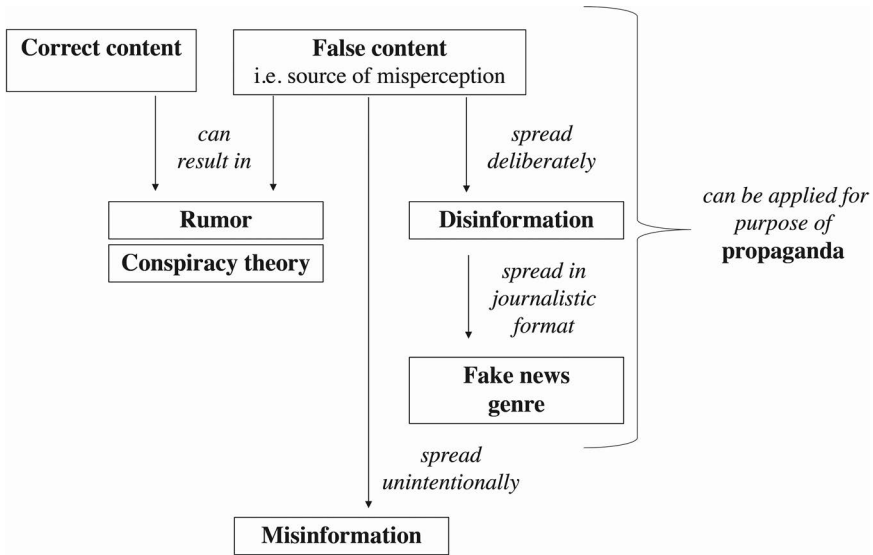


Figure 4.1 Relevant Concepts of Falsehood.

Note. This overview was originally published in Egelhofer and Lecheler (2019).

as the consequence of a misunderstanding or sloppy journalism (McNair, 2017). *Disinformation*, on the other hand, is incorrect or misleading information that is disseminated deliberately (Bakir & McStay, 2018; HLEG, 2018; Lazer et al., 2018). Thus, while both misinformation and disinformation are inaccurate or misleading, they are distinguished by their intent.

The term “fake news” is more difficult to conceptualize. Actually, there are suggestions that it should be abandoned in science altogether, and it has been labeled as “problematic”, “inadequate and misleading”, and “unhelpful” (Albright 2017; HLEG, 2018; Wardle, 2017). However, there is also evidence suggesting that it may describe a novel format or genre within disinformation practices. Research has, for example, shown that there is disinformation that expressly mimics “news media content in form” using digital technologies (Lazer et al., 2018, p. 1094). This means a type of false information that is the pseudo journalistic imitation of news – it is not only false, but fake. For instance, research has suggested that “fake news” consists of similar structural components as “real news”, such as a headline, a text body, and sometimes pictures (Horne & Adali, 2017). It thus mimics the result of journalistic research that follows certain professional standards, and may lead to recipients misattributing fake news articles as genuine and credible (Mustafaraj & Metaxas, 2017; Vargo et al., 2018).

But “fake news” is also an interesting concept because it is an effective *label* to discredit and delegitimize journalism and news media (Egelhofer & Lecheler, 2019). This label has its infamous origins in US President Donald Trump’s

relationship with many US legacy news media outlets before and after his election in 2016. Labeling these outlets as “fake” was effective, simply because the term already had an inherent connotation as a potentially dangerous development in modern democracies. Today, the fake news label is used by political leaders across the globe who wish to “muzzle the media on the pretext of fighting false information” and thereby defend censorship (Reporters without Borders, 2017, para. 1). These actors are almost always populist, which is logical since one of the core attributes of populism is anti-elitist rhetoric, which can be directed at political elites but also against the media (De Vreese, 2017; Jagers & Walgrave, 2007; Krämer, 2018).

Misinformation, disinformation, and fake news are also related to other concepts, such as propaganda, conspiracy theories, and rumors. Propaganda is “the deliberate, systematic attempt to shape perceptions, manipulate cognitions, and direct behavior to achieve a response that furthers the desired intent of the propagandist” (Jowett & O’Donnell, 2014, p. 7). In that way, any information – accurate or not – can be used for propagandistic purposes, and propaganda should thus be seen as an overarching class of communication. Conspiracy theories and rumors describe often oversimplified and elite-critical information “unsupported by the best available evidence” (Flynn et al., 2017, p. 129), and can include mis- or disinformation (including the fake news genre). However, it may also contain factual information. Both were around long before the emergence of “fake news” (McNair, 2017), but fake news can be used to spread information that supports rumors and conspiracy theories (Douglas et al., 2017). [Figure 4.1](#) visualizes the different concepts of falsehoods relevant in this chapter.

The Supply of Actual Disinformation, Misinformation, and Fake News

We will now discuss the extent to which different types of actors, in particular (1) political actors, (2) media actors, and (3) citizens, play a role in the creation and dissemination of actual falsehoods. This unites the literatures concerned with the problematic supply of information from local and foreign elite actors, such as political parties or intelligence services (Bastos & Farkas, 2019), with insights on the role of private individuals in creating and disseminating false information online (Duffy et al., 2020). In this review, we include research on disinformation, fake news, *and* misinformation, as all involved actors may both intentionally and unintentionally create or further disseminate inaccurate information.

THE SUPPLY CHAIN

In our conceptualization, the supply chain of mis- and disinformation comprises the (1) creation and/or (2) the dissemination or sharing of inaccurate content (Duffy et al., 2020; Wardle & Derakhshan, 2017). For misinformation, both processes are unintentional. That is, those involved in the creation and/or

dissemination of misinformation do not know that this information is incorrect. Actors involved in the creation and/or dissemination of disinformation, on the other hand, do know it is incorrect and have an intention to deceive consumers of this content. However, incorrect content that has been created intentionally (i.e. disinformation) can be shared by actors unaware that this content is incorrect (Egelhofer & Lecheler, 2019). Thus, in the context of disinformation, intention means *knowing that information is untrue* at the point of creation or dissemination. This implies that intention is dependent on the source of creation or dissemination. In other words, the intention of the creating actor can differ from the intention of the disseminating actor, meaning that misinformation can become disinformation and vice versa. Figure 4.2 visualizes the supply chain as a process of creation and dissemination of falsehoods, showing that supply is always a multi-step process.

MOTIVES FOR INITIATING THE SUPPLY CHAIN

Turning to research on the motivations for supplying false content, empirical research is unfortunately relatively limited. This is, first and foremost, because actors may create and disseminate false content unintentionally (i.e. misinformation), which means that motivations are different as these actors may believe that a particular piece of information is true. However, empirical research is also limited by the fact that disinformation and fake news represent an act of deception, and that “those who want to mislead others also tend to mask their identity” (Guess & Lyons, 2020, p. 13). This means that some of the research we discuss below is based on an assumption of intentionality – sometimes without direct

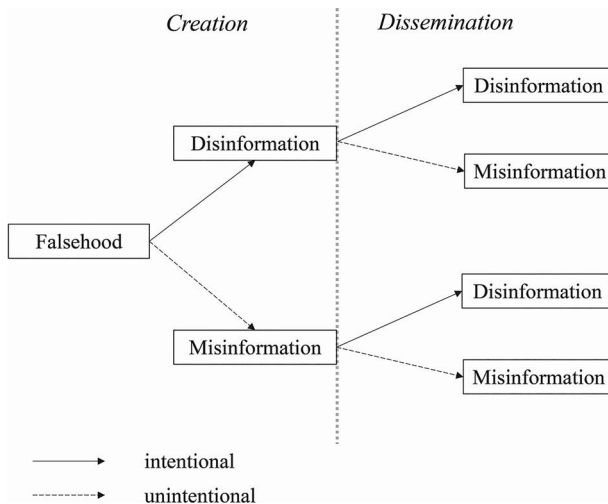


Figure 4.2 The Supply Chain of Falsehoods.

means of measuring it. We follow these assumptions, but are aware that more research is needed to substantiate claims of intentional supply.

When considering what we *do* know of the intentional creation and dissemination, it is most prudent to focus on two dimensions: political and financial motives for deception (Allcott & Gentzkow, 2017; Lazer et al., 2018; Marwick & Lewis, 2017). Political motives often relate to the disruption of election campaigns. Most famously in recent years, researchers and other civil society actors have alleged that disinformation campaigns influenced the election outcomes of the 2016 UK Brexit referendum and the 2016 US presidential elections (Bennett & Livingston, 2018). Also, there have been fears that the 2019 European Parliament election campaign was susceptible to foreign disinformation campaigns in a number of member states (Scott & Cerulus, 2019). Beyond electoral gain, there are of course other short- and long-term political goals, such as disruption of foreign relations, party politics, targeting press freedom or freedom of speech, and the destabilization of a state or region (Bradshaw & Howard, 2018). Financial motives are, in turn, often related to the workings of digital advertising and the expectation that a particular story will stir attention and clicks, which are then converted to advertising revenue (Allcott & Gentzkow, 2017). This idea links falsehoods to the emergence of “clickbait”, a concept referring to the creation of news content solely aimed at generating attention through sensational and emotionally appealing headlines (Bakir & McStay, 2018). In the following, we will present political, media, and citizen actor motivations in more detail. [Table 4.1](#) summarizes these motives.

POLITICAL ACTORS

A first supply chain involves (national) party actors in full public scrutiny, and the communication we can observe from these actors. Recent research has mainly focused on the role of populist leaders in supplying disinformation to voters before and after an election (Corbu & Negrea-Busuioc, 2020; Hameleers & Minihold, 2020). Most famously, claims made by the US President Donald Trump have been studied for their accuracy and influence by both scholars and other civil society actors (McGranahan, 2017). The role of President Trump in spreading disinformation has also inspired the emergence of fact-checking

Table 4.1 Motives of Actors in the Supply Chain of Falsehoods

	<i>Creators</i>		<i>Disseminators</i>	
	<i>Disinformation (intentional)</i>	<i>Misinformation (unintentional)</i>	<i>Disinformation (intentional)</i>	<i>Misinformation (unintentional)</i>
Political	Political	Believe true	Political	Believe true
Media	Political	Believe true	Political	Believe true
	Financial		Financial	To correct
Private	Political	Believe true	Political	Believe true
	Financial			To correct

genres in traditional legacy news outlets. For example, an ongoing tracking of fact checkers at *The Washington Post* shows that, within 1,366 days as president, Trump made over 25,653 incorrect or misleading claims (The Washington Post, 2020, see also Marwick & Lewis, 2017). Yet, this case also highlights the problem of distinguishing between misinformation and disinformation: even if unlikely, it is possible that Trump or those around him actually made false and misleading claims in good faith and thus believed this information to be true. This may be conceivable when considering that elite actors regularly follow headlines in known media outlets when considering their own communicative efforts (Van Aelst & Walgrave, 2016). Bennett and Livingston (2018), for instance, describe a case where President Trump repeated false claims about an alleged crime wave by Muslim refugees and immigrants in Sweden – based on an inaccurate report in FOX News. Also, if Trump and his allies honestly believed that he won the 2020 election, despite the evidence that Biden won and that there was no fraud involved, it would, however, constitute an example of knowledge resistance among political elites. Important to note, at the same time, is that initial studies suggest that the use of mis- and disinformation by political actors such as Trump does not have negative backlash effects on how voters perceive these actors (Nyhan et al., 2019; Swire-Thompson et al., 2020).

A second supply chain is more clandestine. This supply chain is related to (foreign) state actors and intelligence services, who create and spread disinformation without taking credit for doing so. Instead, they employ the rather classic technique of disseminating false information as a covert action, but in new digital forms (Bittman, 1990; Landon-Murray et al., 2019). Known as computational propaganda (Woolley, 2020), the currently most publicly discussed example is Russian (state) actors. Here, a notable example is the Internet Research Agency (IRA), an organization based in St. Petersburg, linked to the Kremlin, which operated *Twitter* and *Facebook* accounts for foreign interference in the 2016 US presidential elections (Bastos & Farkas, 2019; Guess & Lyons, 2020). When considering such examples, the assumption is that the creation and further dissemination through fake social media accounts (bots) is intentional. Hence, these actors are usually classified as malicious political actors (Bastos & Farkas, 2019; Lukito, 2020), making it appropriate to conceptualize what they disseminate as disinformation and/or fake news. Russian actors are naturally not the only state actors performing covert dissemination campaigns (Bradshaw & Howard, 2018), but there is a lack of empirical research on the subject. Existing studies show, however, that disinformation efforts by clandestine or malicious actors are aided by citizen efforts, in the sense that citizens often participate in the sharing of false information on social media (Golovchenko et al., 2018).

Media Actors. An examination of the supply of misinformation must, first, take into account the occurrence of honest journalists unintentionally disseminating misinformation. For instance, journalists might introduce falsehoods into their reporting by mistake, because they hold misperceptions and believe it to be true, because they do not have the time to check their sources, or because of limited verification skills. Research suggests that misinformation spread by media

actors today may often be the consequence of a lack of digital verification skills (Lecheler & Kruikemeier, 2016). Verifying the veracity of information generated online, such as defining the geolocation and identity of a source on Twitter or other social media platforms, is increasingly difficult for time-crunched journalists, or may be perceived as less important to them in a time when online publication allows for the later correction of incorrect information (Brandtzaeg et al., 2016). Along these lines, journalists may also unintentionally disseminate maliciously created elite actor disinformation (fake news or dissemination as part of a propaganda campaign), thereby failing to fulfill not only basic professional standards but also their function within democracies (Strömbäck et al., 2020).

The creation and dissemination of disinformation is an equally important aspect when considering media actors. There is evidence suggesting that some journalists deliberately distort facts and may have a personal or organizational intention to deceive. Most prominently discussed in this context are hyper-partisan media outlets, such as the far-right news website *Infowars* (Marwick & Lewis, 2017; McNair, 2017). It is also possible that journalistic actors intentionally spread incorrect information further. For example, Vargo et al. (2018) show that partisan news media repeatedly cover fake news content when it fits their agendas (see also Benkler et al., 2018). However, financial motivations might be equally relevant, to the extent that journalists incorporate mis- or disinformation into their reporting to generate clickbait or to better their career chances (Bakir & McStay, 2018). When considering media actors, dissemination of disinformation is the next step.

Considering when and why media actors spread falsehoods becomes even more relevant in light of recent research suggesting that a high share of people learn about mis- and disinformation from mainstream news media (Tsfati et al., 2020) and not from social or partisan alternative media as is often assumed (Fletcher et al., 2018; Grinberg et al., 2019). While this does not relieve platforms of their responsibility of policing false content, it raises important questions regarding journalistic responsibility. Tsfati et al. (2020) suggest that this dissemination may be unintentional, as most mainstream journalists follow professional standards about informing and not misleading their audiences (Tsfati et al., 2020). However, falsehoods are regularly sensational and outlandish, and thus fit what journalists consider to be newsworthy (Marwick & Lewis, 2017; Tsfati et al., 2020). In this sense, journalists may be held accountable for their spread of disinformation and misinformation, as the absence of malicious intent does not acquit them from failing to value fundamental professional norms, such as accuracy, over financially driven motives, such as sensationalism. What is more, spreading the word about a piece of false information, even for the purpose of fact-checking or contextualizing, may create a stage for those who wish to mislead audiences on certain political or social issues (Lewandowsky et al., 2012).

Lastly, it is important to not limit the idea of “media actors” to journalists only. Recent research has increasingly focused on the powerful role social media platforms play as actors in their own right in the supply of disinformation. As dominant information sources, they play a decisive role in the dissemination of mis- and disinformation (Guess et al., 2020; Nelson & Taneja, 2018). While

there is a growing literature focusing on how this dissemination may be regulated, some have looked at the platform's own initiatives to curb their (unintentional) dissemination of misinformation across the globe, be it through content moderation, public information, or adaptations to community guidelines (Gillespie, 2018; Iosifidis & Nicoli, 2020).

CITIZENS

Because digital content creation and dissemination is increasingly accessible, private individuals also play a decisive role in the supply of mis- and disinformation. While a growing literature focuses on how user-driven fact-checking and debunking can curb the spread of dis- and misinformation (Mena, 2020; Zeng et al., 2019), much less is known about the intentional creation and dissemination of falsehoods by citizens. One example in the literature concerns a large number of fake news stories that emerged during the 2016 US presidential election, which originated with a group of young Macedonian internet users. These users were found to be spreading pro-Trump disinformation. Initially, it was believed that this was an easy way to earn money, but recent investigative reports suggest links to Russian and US state actors (Guess & Lyons, 2020; Silverman et al., 2018). Citizens are, furthermore, often involved in the unintentional dissemination of mis- and disinformation on social media. This may occur simply because they hold misperceptions or are uninformed. Recent research suggests that citizens may also inadvertently increase the visibility of false content through citizen journalism and fact-checking activities (Zeng et al., 2019). Interestingly, Duffy et al. (2020) argue about the important role that social ties and networks may have in the spread of false content online:

In many cases, people share (fake) news not because they want to destabilise a country nor because they want to shore up their political credentials among likeminded friends, but because they want to help, entertain or inform friends and family (...). So, while fake news is often created to destabilise society, it may be shared to enhance and maintain friendships. This makes a crucial distinction between motivations for creating and for sharing fake news. (p. 1965)

In this sense, motivations for supplying mis- and disinformation when considering individual citizens may be political or financial, but in a private sphere, information also creates networks and ties with friends, colleagues, and family. Thus, future research needs to consider how and why information is shared online and tie this knowledge into the disinformation literature.

DETERMINANTS OF IMPACT

Although there are several supply chains of mis- and disinformation, they may not be equally impactful. In this context, we will focus in particular on supplier

characteristics, although content-characteristics are also important. When considering the supplier of falsehood, the available literature points at two key and interconnected determinants of impact, namely (1) financial resources, and (2) source credibility or reputation.

Financial resources influence the impact of falsehoods at a number of levels. First, they determine what tools can be used to create realistic and credible-looking false content. For example, recent research suggests that visual disinformation (Hameleers et al., 2020) and especially deepfakes – the use of software to create manipulated videos which “can make it seem as if a person says or does something, while in reality, they have never said or done anything of the sorts” (Dobber et al., 2021, p. 2) – might be particularly persuasive. These visual forms of disinformation are more costly to produce. Second, financial resources enable more far-reaching and thus more impactful distribution of falsehoods. For instance, broad dissemination is more likely for those who can use social bots, that is, software-controlled social media accounts that automatically interact with other users (Hindman & Barash, 2018; Shao et al., 2017). A third resource-driven determinant is media ownership, as those who own or control media outlets can influence the information reported as well as disseminated in this outlet. This is particularly important when considering authoritative states and regions with limited media freedom. Here, state control is directly used to decide which messages are reported or to prevent journalists from correcting and fact-checking false content (Khaldarova & Pantti, 2016; Reporters without Borders, 2020). This means that, by controlling public information flows in their countries, these actors can ensure a widespread distribution of disinformation.

However, success is also determined by the reputation and credibility of the source actor. Here, political and media actors are in a better position than private citizens. Often, elite actors are provided an expert status, and are believed to be sources of credible information (Zaller, 1992). This, however, depends on the office and share of votes a particular actor or their party holds (Green-Pedersen et al., 2017), as well as other factors. For example, it would likely have had less impact if a private actor or a lesser-known politician, instead of Trump, would have suggested that injecting disinfectant might be an effective treatment for a COVID-19 infection (Rogers et al., 2020). Importantly, however, source credibility for political actors is closely connected to partisanship, and may thus not be awarded through status only (Berinsky, 2017). For example, Swire et al. (2017) show in an experiment that when incorrect information was attributed to Donald Trump, Republicans perceived it as more credible compared to when it was attributed to no source. With respect to Democrats, the opposite held true.

The Supply of Perceived Disinformation, Misinformation, and Fake News

Beyond the actual supply of mis- and disinformation, another mechanism that might lead to misperceptions and contribute to knowledge resistance is the perception that false and misleading information is widespread. Among other

things, this might lead to growing beliefs that perfectly factual information is actually incorrect.

Public concerns about the impact of falsehoods are certainly high. For example, multi-country survey data from the *Digital News Report* show that more than half of respondents in the sample are strongly concerned with the amount of nonfactual content in online news environments (Newman, 2018, 2019). Survey research from the US also shows that many are concerned about mis- and disinformation. In 2016, for example, about two-thirds of Americans worried that fake news has caused “a great deal of confusion about the basic facts of current issues and events” (Barthel et al., 2016, para. 2). In 2019, US citizens even ranked disinformation as a more worrisome issue than violent crime, climate change, or racism (Mitchell et al., 2019). At the same time, other studies suggest that the actual number of people who are exposed to false content regularly is comparably small (Grinberg et al., 2019), and that users often ignore false information when they encounter it (Tandoc et al., 2020).

While the actual level of exposure is still to be determined in most contexts, the ubiquitous debate about the problem has led to another challenge, relevant in the context of this chapter: the normalization and weaponization of the term “fake news” and allegations of falsehood in general (Egelhofer et al., 2020). This has provided a number of political actors with tools to efficiently instrumentalize public concerns about mis- and disinformation to their advantage. More specifically, it has become increasingly common that politicians accuse traditional media outlets of spreading incorrect information or label specific news messages as fake. The most salient example of this trend is the use of the term “fake news” by politicians as an effective label to discredit journalism (Egelhofer & Lecheler, 2019), but also issue positions by opposing political actors (Brummette et al., 2018; Hameleers, 2020).

This trend also goes beyond the buzzword “fake news”. For example, Hameleers (2020) has shown that populist politicians, such as Trump and the Dutch politician Geert Wilders, frequently make use of mis- and disinformation attributions in general (see also Hameleers & Minihold, 2020). Similar to the actual use of falsehood, it is however difficult to prove whether these accusations of mis- and disinformation are *intentional* attempts to undermine incongruent issue positions. In other words, we rarely know for certain whether the accusing actor believes that a piece of information is indeed incorrect or whether they know that it is true but aim to discredit it in order to counteract its impact on the audience.

Research on this dimension of the disinformation phenomenon is limited, and thus far heavily focused on political actors such as Trump (Hameleers, 2020; Meeks, 2020). However, studies show that private citizens (Brummette et al., 2018; Tong et al., 2020) and journalistic actors (Egelhofer et al., 2020; Farhall et al., 2019) also make use of the fake news label and similar accusations of falsehood.

Research furthermore suggests that this supply of perceived mis- and disinformation, and the use of fake news/disinformation accusations specifically,

might have a number of worrisome consequences for news media and citizens. First, the salient debate about disinformation and its potential risks has been exploited by politicians in some authoritarian countries as an excuse to restrict press freedom (Newman, 2018; Reporters without Borders, 2017). Second, the use of these accusations might have negative consequences for citizens' media perceptions. For example, studies suggest that the use of the fake news term, whether by fictive political elites (Van Duyn & Collier, 2019) or Trump (Guess et al., 2017), may decrease media trust. Moreover, it may lead to a polarization of media diets, where people increasingly use and trust different media. At least that has been shown in the case of the US. For example, Van der Linden et al. (2020) show that, when asked to indicate what they connect with the term "fake news", conservatives state that left-leaning news outlets (such as CNN) and the media in general are fake news, while liberals connect right-leaning outlets (such as FOX News) and Donald Trump with the term. Lastly, a recent study shows that the perceived supply of disinformation also has consequences for citizens' behavior. More specifically, when citizens perceive that a high share of the general information available on the topic of COVID-19 is disinformation, they are less willing to follow governmental instructions such as social distancing (Hameleers et al., 2020).

Conclusion

Summing up, there is a growing body of literature on the supply and the impact of misinformation, disinformation, and fake news on citizens' perceptions and attitudes. As this chapter shows, however, we know only comparatively little about both the prevalence of misinformation, disinformation, and fake news, and about those who supply this false information. The available research suggests that politicians, media, and citizen actors are all involved, but missing data concerning the motivations for supply often limit this literature to case studies at the expense of broader more systematic examinations. Research on the supply side is also curbed by the complexity of the supply chain. In this chapter, we have reduced this chain to the creation and dissemination of falsehoods. However, both are multi-step processes, often including the (unintentional) collaboration of different actor groups intent on staying hidden. The challenge of the supply side is exacerbated by another phenomenon: the supply of perceived falsehoods. The "fake news"-crisis has led elite actors across the globe to apply the fake news label to legacy media or to any other "false" thing, influencing not only media trust and legitimacy, but also leading to biased public estimates as to how large the impact of false news or information on an individuals' life actually is.

To help remedy this, and thereby further our understanding of the processes leading to misperceptions and knowledge resistance, we suggest four avenues for future research on the supply of misinformation, disinformation, and fake news. First, there is a crucial need for research tackling the question of intentionality in the production of falsehoods as well as in the use of attributions of falsehood. Here, we suggested reconstructive interviews with journalistic actors. Along the same

lines, interviews with political actors could help us understand whether speaking the truth is no longer seen as necessary in contemporary political communication environments, or whether political actors that contribute to the dissemination of falsehoods do it because they believe the falsehoods to be true. If the latter turns out to be the case, it would mean a polarization of truth and could result in “situations in which different political camps cannot even agree upon very basic facts and evidence, or in discourses in which mere opinions not backed by evidence are traded as facts”, as suggested by Van Aelst et al. (2017, p. 14).

A second important aspect is the further determination of actual exposure to disinformation in digital spaces. This is most important when assumptions of “foreign influence” take hold, as discussed regarding the influence of Russian disinformation campaigns. This requires, however, better access to social media data for social scientists. At the moment of writing this chapter, most relevant data for studying disinformation online is not accessible for researchers, and an ongoing struggle between scholars, social media platforms, civil society actors, and regulators does not bode well for any such access in the near future. At the end of the day, there will however be no independent evidence on the extent of exposure to actual disinformation and fake news without this access (see also Guess & Lyons, 2020; Pasquetto et al., 2020). This access is also relevant in light of conducting comparative and non-Western research on the topic of the supply of false and misleading information. Thus far, there is a strong and unfortunate bias in favoring US-based research on the topic.

This leads to a third important avenue for future research. In this chapter, we have relied on a relatively traditional view of three actor groups involved in the supply of misinformation, disinformation, and fake news: political elites, media, and citizens. However, when discussing social media platforms and other intermediaries, we are left with the question of dissemination only, while the production of falsehoods seems less important. In this context, the responsibility of social media platforms as sources of falsehoods must however be better understood. This research necessarily must be interdisciplinary, taking into account insights from legal to data science scholars also.

Finally, a better understanding of falsehood supply chains would allow us to estimate their effects not just in the creation of misperceptions, but also in the fundamental processes of information processing. For instance, source cues likely interact with the creation and dissemination of false information, and the same falsehood provided by either a “normal” citizen versus a journalistic or political actor may have differential effects on how information is processed into memory. Along the same lines, potential knowledge effects may also depend on the perceived intentionality of deception. For example, it might make a difference for citizens to learn that they have been exposed to incorrect information that was created intentionally (i.e. disinformation, fake news) as opposed to by mistake (i.e. misinformation). Whether this is actually the case remains to be further investigated, however.

In sum, the literature discussed in this chapter shows that our understanding of misperceptions and knowledge resistance depends on empirical research

that observes the supply chains of information in democracies and beyond. Unsurprisingly, the literature suggests that the actual supply of disinformation prevents the formation of informed attitudes among citizens. It is however also important to take into consideration that perceptions of widespread dissemination of false and misleading information might also contribute to misperceptions and knowledge resistance, if or when citizens resist perfectly correct information as a result of prolonged debates about the dangers of disinformation in society. This function of the effects of the perceived increase in the supply of disinformation must form a second important research theme within our field.

Note

- 1 Parts of this chapter are based on Egelhofer and Lecheler (2019) and Egelhofer et al. (2020).

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5 Selective Exposure and Attention to Attitude-Consistent and Attitude-Discrepant Information

Reviewing the Evidence

Daniel Sude and Silvia Knobloch-Westerwick

Introduction

In the internet era, citizens have an unprecedented ability to access information (Prior, 2007). They can select information based on a widening array of factors – from authors, to outlets, to social cues generated by other users. Increasingly, researchers are investigating interactions between these myriad factors, developing a rich understanding of what leads individuals to seek out information, in particular, online. Ever present in these investigations is a concern for both the personal and societal consequences of this information. Often, researchers contrast observed patterns of human behavior to a normative ideal. This normative ideal, articulated particularly well in political domains (e.g., Strömbäck, 2005), suggests that people should (a) search for novel information in order to acquire new knowledge, (b) in the process of searching, distinguish low-quality from high-quality information, and (c) update their views in response to high-quality information.

Instead, people typically demonstrate a confirmation bias – a preference for information that is consistent with pre-existing attitudes and beliefs (e.g., Hart et al., 2009). They can even show a tendency to discount information that challenges preexisting views (e.g., Nickerson, 1998; Taber & Lodge, 2006). The current chapter reviews evidence concerning this confirmation bias. Specifically, it focuses on one manifestation: a preference for attitude-consistent information – information that is consistent with the content or valence of pre-existing attitudes. In the political domain, for example, a citizen could search for information in favor of a political policy. After finding that information, that citizen may become more certain about the validity of arguments and evidence with which he was already familiar. He may also, however, encounter new arguments and evidence that further cement his existing positive attitude (e.g., Dvir-Gvirsman, 2014). He may even grow merely more passionate about the policy, feeling an intensified affective reaction. These are conceptually orthogonal outcomes. A confirmation bias can lead to greater certainty, greater knowledge, or mere passionate intensity.

When people demonstrate a confirmation bias, then, they are typically departing from the normative ideal. As is reviewed in this chapter, people (a) often

neglect attitude-discrepant information, (b) tend to be biased in their assessments of the quality of attitude-consistent information, and (c) under certain circumstances, dismiss attitude-discrepant information out of hand. At a societal level, these departures from the normative ideal can have negative consequences: social groups that share attitudes can then become more extreme (Levendusky, 2009), leading to social fragmentation and social dysfunction (Bennett & Iyengar, 2008). One manifestation of this dysfunction is political polarization (Prior, 2013; Stroud, 2010). Another is the acceptance of attitude-consistent misinformation and disinformation (e.g., Hameleers & van der Meer, 2020). For example, Pew Research Center data suggested that Democrats and Republicans in the United States formed different attitudes toward the danger posed by COVID-19 in part because of differences in partisan media messaging (Funk & Tyson, 2020); a study with a Canadian sample examining exposure to misinformation about COVID-19 yielded similar findings (Bridgman et al., 2020). In several ways, then, these processes contribute to knowledge resistance both in a narrow and a wider sense (see [Chapter 2](#)).

The current review tackles the confirmation bias through both intrapersonal and interpersonal lenses, arguing for a multi-motive approach to the topic. To begin, it situates research on the confirmation bias in terms of selective exposure research more generally. Next, theoretical perspectives on the confirmation bias are examined in three sections: the first addresses the motivation to bolster or maintain one's own views, the second addresses social influence processes, and the third addresses factors that can lead to bias even when individuals are motivated to form accurate views. Finally, a concluding discussion is offered regarding interventions designed to overcome the confirmation bias.

Selective Exposure

Studies investigating the factors that impact media or message choices fall under the general heading of selective exposure studies. Selective exposure studies examine the broad array of factors that impact these choices, honing in on contexts in which there is “any systematic bias in audience composition for a given medium or message, as well as any systematic bias in selected messages that diverges from the composition of accessible messages” (Knobloch-Westerwick, 2015a, p. 3). Notably, these choices can reflect many psychological influences, allowing investigation of complex, dynamic, processes. For a review of selective exposure across different “layers” of media, please see Knobloch-Westerwick et al. (2019b).

Studies have yielded evidence of a political confirmation bias in samples from the US, Germany, Israel, Japan, and South Korea (Garrett et al., 2014; Kim et al., 2014; Knobloch-Westerwick et al., 2019a). Note that the confirmation bias is not limited to politics: researchers have examined it in the context of emerging technologies (e.g., Schwind & Buder, 2012), product evaluation (e.g., Liang, 2016), and criminal trials (e.g., Lidén et al., 2019). However, driven by social concerns, the majority of research on this bias in communication science

examines political and politicized science contexts. These political and politicized contexts are the focus of the current review.

The following review of evidence is structured into three parts: the first examines the motivation to defend existing views; the second addresses influence from social peers; and the third discusses failures to overcome the confirmation bias, even when people are motivated to achieve accuracy.

Defending Individual Beliefs

The bulk of research on the confirmation bias pattern has been framed in terms of an individual's need to defend pre-existing views (e.g., Hart et al., 2009; Knobloch-Westerwick, 2015a). This framing is grounded in Festinger's (1957) cognitive dissonance theory. Cognitive dissonance theory is, broadly, an account of why and how people maintain a stable set of beliefs and attitudes even in the face of threat. Festinger identified multiple sources of threat: when two beliefs are in logical conflict with one another, when one's actions are incompatible with one's self-concept, and when credible information is at odds with what one already believes. This experience of conflict and contradiction results, for Festinger, in a state of dissonance – a psychologically unpleasant state linked in later experimental research to both negative affect (Harmon-Jones, 2000) and heightened arousal (Croyle & Cooper, 1983). Importantly, Festinger believed that the threat posed by dissonance was at times unavoidable: belief systems are not perfectly coherent; actions are not perfectly aligned with self-concepts; we encounter new information and learn over time.

The degree of dissonance experienced in the face of cognitive conflict was proposed to be “a function of the importance of the [dissonant cognitive] elements. The more these elements are important to, or valued by, the person, the greater will be the magnitude of the dissonant relation between them” (Festinger, 1957, p. 16). When beliefs are important, an individual was predicted to experience dissonance when encountering or even anticipating encountering challenging information: “In the presence of such dissonance, then a person might be expected to actively seek new information that would reduce the total dissonance and, at the same time, to avoid new information that might increase the existing dissonance” (Festinger, 1957, p. 22). This prediction inspired decades of future research on confirmation bias.

Recent empirical research offers some support for these predictions. Following Festinger, researchers have devoted their attention to understanding how attitudes, particularly their extremity and strength, impact the magnitude of the confirmation bias. Across both explicit and implicit attitude measures (e.g. Arendt et al., 2019), as well as measures of attitude certainty and attitude importance (Westerwick et al., 2013, 2020), researchers have demonstrated that the confirmation bias is indeed shaped by the subjective “weight” of an individual's attitudes.

However, in the context of selective exposure research, an unresolved empirical debate is whether this pattern of information exposure is driven by reward or punishment. Few studies examining selective exposure in communication

science have measured or manipulated dissonance directly. While limited experimental evidence demonstrated that exposure to attitude-discrepant information can promote seeking attitude-consistent information (Tsang, 2019), a behavioral pattern that Festinger predicted, these findings were not dependent on the experience of “threat” (measured by the researchers as self-reported anger, frustration, disgust, and irritation, all high arousal negative emotions). However, individuals in that study who reported experiencing threat did report intentions to avoid attitude-discrepant information in the future, as Festinger predicted. In other words, the empirical reality is likely more complicated than Festinger initially argued. Sometimes, attitude-discrepant information may be avoided because individuals are experiencing threat. At other times, attitude-consistent information may be sought out to resolve pre-existing dissonance. Further, many researchers now argue (e.g., Garrett, 2009) that information that aids justifying one’s pre-existing views, even in the absence of threat, may be rewarding in and of itself.

Adding further complexity to researchers’ understanding of defense-oriented processes, seeking attitude-consistent information is not the sole way to defend one’s existing views. Researchers have also identified an alternative pattern in which individuals seek out attitude-discrepant information in order to counter-argue it: if they are successful, their initial attitudes can even become stronger (more extreme). Taber and Lodge (2006) labeled this phenomenon the “disconfirmation bias”. Observation of this behavioral pattern goes back to earlier research on selective exposure, including Lowin’s (1967) approach and avoidance model which argued that attitude-discrepant information will be sought out when it is perceived to be easy to refute.

Empirically, the prevalence of the disconfirmation bias is the topic of continued investigation. Several studies suggest that understanding the relationship between the strength of prior views, the confirmation bias, and the disconfirmation bias requires understanding how information comes to be considered as credible and able to impact attitudes or noncredible and easy to refute. Westerwick et al. (2017) presented evidence that perceptions of source-bias play a key role. In this selective exposure study, participants could browse attitude-consistent and attitude-discrepant messages attributed either to neutral sources or to sources with a clear partisan slant. A confirmation bias emerged regardless of source slant. Further, this confirmation bias reinforced attitudes. Attitude-consistent information was persuasive from either slant sources or, although the effect was only marginally significant, neutral ones. However, when individuals did read attitude-discrepant messages, a disconfirmation bias pattern emerged only for partisan-slanted sources. When individuals voluntarily read attitude-discrepant information from slant sources, they were not persuaded. When individuals voluntarily read attitude-discrepant information from neutral sources, they were. In other words, in the same study, participants could demonstrate a confirmation bias, a disconfirmation bias, or more normatively ideal processing: participants sometimes read attitude-discrepant information and they were persuaded by that information unless they believed it to be from a biased source.

Findings like these have led researchers to probe other motivations that could impact the confirmation bias and shape its effect on attitudes. This effort has yielded a more complex picture. For example, perceptions of the ease with which information is refuted are likely biased, with attitude-consistent information from even relatively low-credibility sources being perceived as more credible than attitude-discrepant information (e.g., Westerwick et al., 2013). These findings are taken up again when discussing factors that can lead to bias even when people are motivated to be accurate.

Conclusion

The confirmation bias can help individuals to maintain or strengthen their pre-existing views about the world. Attitude-consistent information may be perceived to be inherently rewarding. Attitude-discrepant information may, sometimes, be threatening. However, when attitude-discrepant information is sought out, counter-arguing it can bolster pre-existing attitudes (a disconfirmation bias pattern). At times, however, people simply behave in a way that conforms more closely to a normative ideal – seeking out high-quality attitude-discrepant information and being persuaded by that information.

The next section looks beyond individuals' specific attitudes to examine the confirmation bias in the context of an individual's broader self-concept, as well as their social identities.

The Social Self

While the discussion thus far has concerned individuals' attempts to defend their personal views, one key set of cognitive structures identified by researchers in psychology and communication are the individual's self-concepts (Aronson, 1969), particularly their social identities. While individual attitudes about specific political policies may be deemed important and thus motivate the confirmation bias, a confirmation bias could also serve to promote and protect the overall political self-concept. People with strong partisan identities, for example, should consume more partisan political media; in turn, they should become more confident in their partisan identity; further, they should become better able to communicate with partisan peers. This section first reviews theoretical perspectives arguing that the self-concept can promote a confirmation bias (Knobloch-Westerwick, 2015b; Slater, 2007, 2015). Second, it reviews theoretical perspectives implying that social influence processes more broadly can drive the confirmation bias (e.g., Deutsch & Gerard, 1955; Festinger, 1950; Kelley, 1952; Tajfel & Turner, 1979; Turner et al., 1987).

Self-Concepts

Key theories in communication, such as Knobloch-Westerwick's (2015b) Selective Exposure Self and Affect Management (SESAM) model and Slater's

(2007, 2015) Reinforcing Spirals Model predict an organizing role for the self-concept in driving exposure to media. Both the SESAM model and the Reinforcing Spirals Model postulate that individuals seek information that aligns with their identities and may, under certain circumstances, avoid information that challenges those identities. However, while the Reinforcing Spirals Model assumes relative stability in the self-concept, Knobloch-Westerwick's SESAM model suggests that the self-concept is a situationally malleable variable.

The SESAM model incorporates Markus and Wurf's (1987) notion of the working self-concept – those cognitions about the self which come to mind in the moment and, in turn, shape our thoughts, feelings, and behaviors. From the SESAM model's perspective, for example, the speed with which an American's partisan self-concept comes to mind (its accessibility) prior to selective exposure, in turn, impacts that American's preference for partisan-consistent messages (Knobloch-Westerwick, 2015b). Reading these messages, in turn, renders the partisan self-concept more accessible (Knobloch-Westerwick, 2012; Knobloch-Westerwick & Meng, 2011). A more accessible partisan self-concept after selective exposure is, in turn, associated with both more extreme and more accessible political attitudes (Knobloch-Westerwick, 2015b) which could then lead to an even stronger confirmation bias.

In the terminology of the SESAM model, participants in the above-described studies acted out of a self-consistency motivation: they selected and spent time reading messages that were consistent with their partisan self-concepts. The SESAM model also examines other drivers of selective exposure, including a desire for self-enhancement (to feel better about oneself) or self-improvement. These latter motivations are predicted to lead to social comparison processes, with selective exposure to information about people who are less successful (downward) or more successful (upward) helping individuals to (a) feel better about themselves (self-enhancement) or (b) to make positive changes in their lives (self-improvement). The SESAM model focuses on interpersonal social comparison. However, its predictions are paralleled in other theories analyzing key intra- and intergroup processes of direct relevance to the confirmation bias. Research on the confirmation bias driven by these theories is described below.

Social Influence

While the preceding accounts examine the confirmation bias in the context of individual attitudes or self-concepts, Festinger (1957) focused on group-based processes as well. He postulated that dissonance arises when individuals hold opinions that are distinct from those of their peers and reasoned that people would tend to shift their attitudes to conform to peer opinion. These predictions have received empirical support (e.g., Matz & Wood, 2005). However, not all peers are equally influential. Decades of research in social psychology and communication science have examined social influence processes, identifying which peers are influential and under what conditions.

This research has largely been guided by the social identity perspective. The social identity perspective has two components, corresponding to a focus on

intragroup relations and a focus on intergroup relations, respectively (Hornsey, 2008). Self-categorization theory (Turner et al., 1987) is concerned with how individuals come to understand themselves as group members and to differentiate themselves from members of other groups. Social identity theory (Tajfel & Turner, 1979) is concerned with the relationships, neutral, positive, or negative, between one's own groups (in-groups) and other groups (out-groups). From this social identity perspective, individuals are argued to look to in-group members for information about the world (potentially driving selective exposure processes). Further, they are predicted to strive to understand themselves through the lens of their in-group identity; thus, rather than focusing on traits that make them unique, they focus on traits that they have in common with in-group members, which, in turn, promotes conformity. Importantly, however, people may identify with different in-groups in different situations. For example, an individual could see himself more as a member of his gender in-group (a man), or more as a member of his partisan in-group (e.g., a Democrat), depending on both the chronic strength of these identities and situational cues. The chronic strength and situational relevance of these identities could, in turn, impact both selective exposure and social influence processes.

For example, messages authored by in-group members can be more persuasive than messages authored by out-group members, even when the in-group authors are not experts on the topic. Researchers have demonstrated that messages authored by out-group members may garner less cognitive processing and be more easily dismissed while messages from in-group members can be persuasive even in the absence of careful processing (e.g., Mackie et al., 1992, 1990).

Experimental studies of selective exposure support many of the predictions of the social identity theory perspective. Dvir-Gvirsman (2017) found that individuals prefer political media consumed by fellow political in-group members, using a survey experiment design manipulating perceptions of the popularity of that media among politically like-minded peers. In a second paper, contrasting gender-in-group identity and political in-group identity, Dvir-Gvirsman (2019) found with an adult Israeli sample that a match between participant gender and source gender could attenuate the political confirmation bias. Specifically, participants were more willing to read politically challenging information if it was attributed to a same-gender source. In another study in that same paper, the content of an article covering sexual harassment scandals involving Israeli politicians was manipulated to blame {absolve} leftist {rightist} politicians. For participants who were strongly identified with their gender, the political confirmation bias was weaker. For participants who were strongly identified with their politics, the political confirmation bias was stronger. This work not only demonstrated that political identity strength can magnify the confirmation bias, but offered researchers hope that rendering non-partisan identities salient could overcome the confirmation bias, a topic taken up again in the closing discussion.

Studies of selective exposure and social influence have also looked beyond the general predictions of the social identity perspective to focus on understanding the impact of specific, experimentally manipulated, social goals. Individuals may

seek out and adopt the in-group's opinions in part to achieve social reward and avoid social punishment. Studies have demonstrated a relationship, for example, between the goal of being liked {disliked} and selective exposure. Walther et al. (2010) examined interpersonal affinity and disaffinity goals (goals to be likable versus not likable). In that study participants who were manipulated to have affinity goals searched for information that was consistent with their anticipated discussion partner's preferences; participants who were manipulated to have disaffinity goals did the opposite. Social goals can have direct impacts on selective exposure.

Schwind and Buder (2012) observed the impacts of primed competitive versus cooperative mindsets on both the confirmation bias and subsequent evaluation of arguments regarding the issue of neuroenhancement. The researchers presented student participants with a set of ostensible search results on the topic, evenly divided into web pages taking pro- and contra-stances. Participants could then select web pages for further viewing. In addition, some participants received a personalized recommendation that they visit a site that was either consistent or discrepant with their attitudes toward neuroenhancement. Regardless of whether individuals were primed with cooperative or competitive mindsets, attitude-discrepant recommendations promoted selecting attitude-discrepant webpages. However, for those in the competitive mindset, these selection decisions lead to biased evaluation of attitude-discrepant sites. In other words, social goals impacted the way that attitude-discrepant information was interpreted: cooperative goals promoted open-minded engagement with attitude-discrepant information; competitive goals lead participants to select but reject this information (a disconfirmation bias pattern).

Although not studied from the perspective of selective exposure, other research has demonstrated that heightening an individual's desire for social connection generally can promote conformity to salient in-groups. For example, Garrett et al. (2020) found impacts of experimentally manipulated social ostracism on adult American partisans' acceptance of misinformation. The researchers drew upon the partisan motivated reasoning literature (Ditto & Lopez, 1992), which is rooted in cognitive dissonance theory, and social psychological perspectives on ostracism, which argue that people seek to form new social connections and affirm their social worth after being ostracized. After social ostracism {inclusion} Democrats were asked to read a fact-check message arguing that Russia did not succeed in directly altering election tallies in the US; Republicans were asked to read a fact-check message arguing that voter fraud in the US was rare. The fact-checks were explicitly framed as a challenge to consensus beliefs held by fellow partisans. The researchers hypothesized that socially ostracized individuals would be more likely to reject the fact-check message (defend in-group consensus). Additionally, the researchers anticipated that their manipulation would have its strongest impact on weaker partisans. In other words, social ostracism was predicted to make weak partisans defensive of their in-group as strong partisans. These predictions were supported. Social motivations created bias.

It is important to note that while it is possible that individuals may practice deception, expressing views that they do not in fact share in order to achieve

social ends, both Festinger's (1957) theorizing and the social identity perspective argue that deception will not satisfy social needs as meaningfully as actual conformity. Indeed, in Garrett et al.'s (2020) work, impacts of ostracism on the rejection of fact-check messages occurred regardless of whether participants believed their responses to be more private or more public.

Conclusion

In summary, individuals do not simply demonstrate a confirmation bias in order to maintain pre-existing attitudes. The confirmation bias may also function to reinforce the broader self-concept or to help individuals to fit into their social worlds.

The next section addresses a more normatively desirable motivation for selective exposure: the desire for objective, accurate information. Then, it presents evidence that even for individuals motivated by accuracy, biased credibility perceptions may in fact promote a confirmation bias.

Seeking Accuracy and Biased Perceptions of Information Quality

While individuals may be prone to defend their existing views or to conform to in-group opinions, they also care about accuracy. In a meta-analysis of 91 individual studies, Hart et al. (2009) identified accuracy motivations as explaining 7% of the variance in selective exposure to information, second only to the 13% of variance explained by what they called defensive motivations. While their analysis speaks to the importance of accuracy goals, the majority of studies included were designed to cleanly distinguish a desire to defend prior beliefs from a desire for accuracy. Typically, across these studies, researchers inferred accuracy motivations whenever the confirmation bias was attenuated. The research discussed in the current section suggests that real-world accuracy motivations could instead drive the confirmation bias. The current section first employs the lens of information utility theory to highlight situations in which accuracy motivation constrains the confirmation bias. Next, instances where biased credibility perceptions may promote the confirmation bias, in the presence of an accuracy motivation, are highlighted.

Accuracy Motivation and Information Utility

One central theoretical perspective on accuracy motivation is that of Atkin's (1973) information utility theory. Synthesizing work examining factors that constrain the confirmation bias (e.g., Cannon, 1964; Festinger, 1964; Freedman, 1965), Atkin postulated that information could fulfill three functions in addition to the reinforcement function identified by cognitive dissonance theory: surveillance, performance, and guidance. Surveillance-relevant information serves, in the information utility theory perspective, to alert people to changes in their environment generally and threats specifically. Performance-relevant information helps individuals to enact new behaviors. Last, guidance-relevance

information helps individuals decide how to feel about things. Much of the empirical research on information utility examines situations in which individuals prefer information that fulfills the surveillance or guidance functions over information that fulfills the reinforcement function. *Ceteris paribus*, surveillance goals should promote selective exposure to attitude-discrepant information.

Before an election, for example, individuals who expect their political party to lose may spend time reading about the rival party's political policies, in order to better understand what the future holds (Knobloch-Westerwick & Kleinman, 2012). The researchers in that study collected data prior to the 2008 election in the United States, using non-student participants between the age of 30 and 65. When the study was conducted, polls favored Democratic candidate Obama over Republican candidate McCain. In that study, Republicans who anticipated electoral loss actively sought out information, even when it was attitude-discrepant, implying a surveillance motivation.

In another test of information utility theory, Hmielowski et al. (2017) examined those who were ambivalent about the 2012 candidates for the US presidency. The researchers proposed two interpretations of this ambivalence. In the first, these individuals experienced a partisan preference but merely felt that they lacked sufficient justification for making the partisan-aligned choice. In the second interpretation, these participants were informed but genuinely ambivalent and would pursue a balanced information search until they were able to make up their minds. Data collected over a three-wave panel survey supported the latter interpretation. Specifically, those who read more attitude-discrepant information at wave one became more ambivalent at wave 2, and, in turn, continued to read attitude-discrepant information at wave 3. The researchers suggest that these individuals were willing to forgo information that would fulfill a reinforcement function in favor of information that allowed surveillance and provided guidance.

Beyond specific election contexts, researchers have identified psychological differences in individuals' tendencies to prioritize surveillance over reinforcement. For example, in one study, individuals with greater interest in politics were more likely to select attitude-discrepant articles on a variety of political topics (Knobloch-Westerwick & Meng, 2009), suggesting a surveillance motivation. Further, the surveillance motivation may often be stronger for science topics than for political topics: regarding science topics, even controversial ones, observational research using a voluntary US national sample demonstrated that individuals actively read information that challenged their existing beliefs (Jang, 2014), if they perceived that they lacked sufficient knowledge. In that study, only when participants were fully confident in their attitudes, or rooting their judgments in their religious identity, did they demonstrate the confirmation bias.

Biased Credibility Perceptions

In contrast to the studies described above, where individuals sought out attitude-discrepant information, other empirical work suggested that people may

disregard this information because they perceive it to be of lower quality. This perspective was tested by Winter et al. (2016), in a study examining selective exposure to articles taking supportive and critical stances regarding the US government's National Security Agency's surveillance programs. Specifically, accuracy, defense, and impression management motivations were manipulated. Participants in the accuracy condition were told that in an upcoming discussion, it was important to "displa[y] accurate logic and reasoning" (Winter et al., 2016, p. 679). Further, they were told that the researchers would award a \$50 Amazon gift card to the individual who, in the accuracy condition, made the best and most accurate arguments (other conditions were offered the same reward, earned through defense or impression management, respectively). An additional control group was told that they could observe but would not participate in the upcoming discussion. Notably, the confirmation bias was evident both among those with accuracy and defense motivations, particularly when participants had stronger prior attitudes. Even participants who could earn a meaningful amount of money by presenting an accurate and logically defensible set of arguments about a topic preferred attitude-consistent information. The researchers argued that this finding could be due to biased assessments of information quality. Simply put, even people who are incentivized to engage in normatively ideal information processing may fail to do so if they automatically assume that attitude-discrepant arguments and evidence are of lower quality.

Other work examining selective exposure offers support for this interpretation. For example, Westernick et al. (2013) presented evidence implying that attitude-consistent content is sometimes perceived to be inherently more credible than attitude-discrepant content. All participants in this selective exposure study favored attitude-consistent messages over attitude-discrepant ones, demonstrating a confirmation bias, regardless of whether these attitude-consistent messages were from amateur or professional sources. Attitude-importance drove the strength of this confirmation bias, which suggests that attitude-consistent information was perceived to be credible, regardless of source expertise.

The origin of this biased credibility assessment may lie in both intrapersonal and interpersonal processes. As discussed previously, from an intrapersonal perspective, people may be motivated to perceive their own views as being correct. Examining Dutch parents of young children, Meppelink et al. (2019) found that parents who were higher in health literacy showed a stronger confirmation bias with regards to vaccine-related information. Note that both pro- and anti-vaccination parents were recruited. When asked to evaluate the credibility of persuasive pro- and anti-vaccination messages, these high health literacy parents demonstrated greater bias. Related to the concept of the disconfirmation bias described earlier, this finding suggests that individuals who are better armed with information may in fact be better able to dismiss attitude-discrepant information as noncredible.

From the interpersonal perspective, social identity theorists argued that people would report greater confidence in views shared by in-group members and

reduced confidence in their personal views when they learn that in-group members disagree (Turner & Oakes, 1986). This theorizing was supported by experiments manipulating perceptions of in-group consensus and observing impacts on participants' confidence in their own attitudes (e.g., Hardin & Higgins, 1996; Rios et al., 2014). Further, communication scholars Flanagin et al. (2014) pinpoint an explicit role for biased credibility perceptions in this process, with information from similar others being deemed more credible than information from dissimilar others, albeit the results were limited to a non-political topic – evaluations of professors.

Further evidence comes from a study directly examining the impact of perceptions of media trust on selective exposure. Knobloch-Westerwick et al. (2019a) collected data from an adult Japanese sample before the 2017 snap election and compared this data with previously collected data from adult US and German samples. Notably, the confirmation bias was smaller in both Japan and Germany than in the US, with the former countries having a mainstream news media that has a broad-based national appeal. Within Japan, individuals' level of media trust, in turn, predicted the strength of their confirmation bias. The more that Japanese individuals perceived their media to be a trustworthy, the weaker a confirmation bias they demonstrated. These findings parallel analyses from the US context. For example, Barnidge et al. (2020) examined the relationship between self-reported partisan media use and perceptions of media bias in a sample of adults from the state of Wisconsin, which has had particularly contentious political campaigns. The partisan-based confirmation bias was associated with perceptions that favored media were unbiased while the media in general was quite biased.

Conclusion

People do seek out attitude-discrepant information in order to form accurate impressions of the world. However, intrapersonal and interpersonal biases in assessments of information quality may motivate a confirmation bias, even when individuals want to be accurate. As the concluding discussion below argues, motivating people to conform to normatively ideal information processing is a complex task that must take intrapersonal and interpersonal processes into account.

Future Directions: Solving the Confirmation Bias Problem

The confirmation bias pattern manifests across dimensions of society – from politics to purchasing. It has many origins, from the anxious arousal of cognitive dissonance to a desire for social integration. Investigations of the confirmation bias through different theoretical lenses have revealed contrasting motivations that must be considered when seeking to predict, or correct, this bias. From research guided by the cognitive dissonance perspective, we know that people are often rewarded by attitude-reinforcing information or

punished by attitude-discrepant information. From the social influence perspective, we know that people may seek information that aids social integration. From the informational utility and biased credibility perspectives, we know that even when motivated to be accurate, individuals may still be biased in their assessments of information quality, and thus demonstrate a confirmation bias.

Observing these patterns, researchers have designed a variety of interventions, ranging from simpler efforts to stimulate objectivity to more complex efforts to leverage the power of social influence.

Promoting Accuracy

Attempts to promote accuracy have a long history in the fields of social psychology and communication (e.g., Redlawsk, 2002; Taber & Lodge, 2006; Tetlock, 1983). This research has revealed one particularly effective technique: telling people that they will have to carefully justify their opinions to third parties. The emphasis on justification appears to be key, inspiring more careful and even-handed consideration of evidence and arguments (e.g., Bolsen et al., 2014). While this approach can promote normatively ideal information processing, it relies on the individual's ability to identify and access sources of quality information. In many situations, people simply do not have this ability. Further, the effectiveness of this manipulation relies on an imagined audience – the person or persons to whom participants imagine justifying their views. In order for this manipulation to work, the individuals must imagine a truly unbiased audience. In political domains, even this “neutral third party” audience is likely imagined as being biased in favor of one's own views.

In part because of these complexities, researchers have moved beyond relying on individuals to achieve objectivity by themselves, and instead sought to promote more open-minded engagement by leveraging social context.

Social Influence and the Confirmation Bias

As discussed previously, one method that researchers have employed to reduce the confirmation bias is to make apolitical social identities salient. Dvir-Gvirsman (2019), for example, found that people who strongly identified with their gender were more likely to select attitude-discrepant political messages authored by a same-gender author. However, other researchers have failed to find effects of apolitical social identities on the political confirmation bias. Across two studies, Wojcieszak (2021) examined the impact on selective exposure of, first, a source's race and their stance on the issue of gun control and, second, a source's gender and their stance on the issue of abortion. Neither race nor gender had meaningful impacts on selective exposure. Impacts from apolitical identities appear to be harder to predict, conditioned as they are on issue-specific associations, identity-cue salience, and identity strength. This represents a new frontier in research on the confirmation bias. There is more to learn.

Social Goals

While the preceding work by Dvir-Gvirsman (2019) and Wojcieszak (2021) considered impacts from apolitical social identities, some evidence supports the notion that priming social goals can bridge national political divides. One experimental study, for example, manipulated open-mindedness by manipulating perceptions of national social norms. Wojcieszak et al. (2020), manipulated open-mindedness (versus close-mindedness) by asking participants to read one of two articles: in the open-mindedness article, participants read that the majority of American citizens were willing to read across partisan lines, and that doing so promoted good citizenship; in the close-mindedness article, participants read that the majority of Americans favored media that aligned with their partisan-positions, and that doing so promoted political participation. Participants receiving the open-mindedness (versus close-mindedness) prime demonstrated an attenuated confirmation bias. To the extent that the confirmation bias was reduced, affective polarization (feeling more negatively about rival partisans and more positively about fellow partisans) was also reduced. In other words, participants in the open-mindedness condition appeared to embrace a more balanced media diet and feel more positively about those who favored rival political parties. This finding echoes that of Schwind and Buder (2012) described previously.

Beyond Selective Exposure

Beyond selective exposure, other researchers have sought to manipulate participants' responses to attitude-discrepant information. Bayes et al. (2020) manipulated multiple psychological motivations and presented motivation-tailored messages in order to promote belief in climate change among adult Republican participants. For example, the authors manipulated social threat by asking participants to read a message arguing that the Republican party was divided over its political policies. Then, they presented a message arguing that the majority of Republicans believe in climate change. At least under a social threat, changing perceptions of group consensus lead to a shift in participant's own views. Note, further, that, even when not matched with a specific motivational state, these tailored messages were, on average, persuasive.

Conclusion

Individuals rarely conform to a normative ideal of information processing. Instead, individuals desire to maintain a stable sense of their worlds, need to function within social groups, and, last, even when motivated to be accurate, may evaluate information quality in a biased way. By carefully addressing these desires, needs, and biases, however, researchers may be able to promote not only more balanced searches for information, but less biased perspectives on the world.

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6 Relevance-Based Knowledge Resistance in Public Conversations

Eliot Michaelson, Jessica Pepp and Rachel Sterken

Introduction

Knowledge resistance, as it is being discussed in this volume, is the tendency to resist available evidence. To get clear on what this means, we need to understand what *evidence* is, what makes it *available*, what it is to *resist* evidence, and whose *tendencies* are under discussion (see Wikforss & Glüer-Pagin in this volume). On the last point – whose tendencies are under discussion – it is natural to assume that it is individual people’s tendencies. Individual people are the resisters of evidence. This is true, but not exclusively so, we think. Indeed, even if individual people are not resistant to the evidence available to them, groups of people and whole societies may be resistant to available evidence. Knowledge resistance can be an epistemic problem not only for individual agents but also for the public sphere.

It might seem odd to suggest that inanimate entities like conversations can resist or have tendencies to resist evidence (or anything, for that matter). However, as we are understanding the notion of resisting, a conversation *can* resist evidence, in something like the way a garment can resist water. A garment does not intend or try to resist water (although its creators may have intended this), nor does a conversation intend to resist evidence. Rather, a conversation, like a garment, can be structured in such a way that it does not take in certain things. This is a kind of systemic resistance, which, while not the same sort of thing as individual people’s resistance to evidence, poses related problems. It is this form of resistance that we aim to illuminate in this chapter.

Let us follow Habermas in taking the public sphere to be a ground-level social phenomenon that can be understood, roughly, as a communicative structure or network that filters and synthesizes information and points of view into collective, public opinions on various matters (See Calhoun, 1992; Habermas, 1989, 1992, 1996; Wessler, 2018). A well-functioning public sphere is generally taken to be a *sine qua non* for participatory democracy and well-functioning societies more generally. The public sphere itself is a structure, network, or social space. What happens in the public sphere is *conversation* – public conversation. A nation’s public conversations on different matters inform citizens and residents, keep officials accountable, and track changes in public desires and opinions. As a

rough starting definition of the kind of knowledge resistance we have in mind, we will say that a *public conversation is resistant to available evidence* if evidence on matters of importance to the conversational participants is kept out of the conversation, even though it is available to become part of the conversation.

Here is a little example to illustrate. Let us take the communicative structure and networks among the parents, teachers, and administrators at a local primary school as a toy model of a public sphere. Suppose that budget cuts at the national level are going to require the school to let go of several teachers, resulting in a marked increase in class size. The administrators suspect that this will greatly upset the parents and teachers, but they believe there is nothing they can do to stop it and would like to prevent too much outcry before the end of the school year. A few parents and teachers have heard about what is going to happen and try to get a discussion going about it on Facebook. The administrators try to counteract this by revealing that two years ago, two teachers were fired for engaging in salacious activities in the break room. As the administrators hoped, prurient fascination with the affair and the opportunity for outrage over its having been kept secret for so long take up so much air space in the school conversation that discussion of the cuts never gets going. Most members of the school community never see anything about the cuts on Facebook or hear anything about it from other members. Those who do hear something about it also get the impression from the rest of the conversation that these cuts must not be a big deal, since no one is really talking about them. The school's public conversation is resistant to the available evidence on a matter of much greater importance than the two-year-old affair, even though its members, individually, may not be.

The resistance to evidence exhibited by the school's public conversation is what we call "relevance-based" resistance to evidence. The resistance is not due to the conversation being dominated by *false* or *inaccurate* claims that the evidence of the cuts and their effects would contradict. (We are imagining that it is true that two teachers were fired for salacious acts.) Rather, the resistance is due to the conversation being dominated by claims that are much less *relevant* for the school community than the evidence that is being crowded out.

To be sure, one major concern is that public conversations become crowded with false or inaccurate information, like fake news. The widespread acceptance, consideration, and even availability of false or inaccurate information makes it harder for new evidence to make its way into the public conversation, or to remain in circulation as a part of that conversation. For genuine evidence will conflict with the misinformation that is accepted by participants in the conversation, considered worthy of consideration, or even just widely available. However, we want to focus on a different kind of evidence resistance, one which stems instead from the non-relevance of information that is prominent in public conversations. This is a different, and much less discussed, concern about the epistemic health of public conversations.

The school example is but one imaginary case that would be rather insignificant in the grand scheme of things, even if it were real. But we take it that there are plenty of real cases of relevance-based resistance to evidence in public

conversations, some of which pose, or have posed, a genuine threat to well-functioning public discourse. This affects the epistemic health and perhaps even the broader functioning of society or groups therein. However, it is not easy to identify clear-cut examples (like the imaginary school case), since doing so requires making difficult evaluations concerning how public conversations are focused at a given time, and which topics are most relevant in them.¹ Indeed, we view the present paper as aimed at providing the beginnings of a framework on which to base such evaluations.

Even if it is difficult to give definitive examples, it is clear enough that with the advent of social media, information can be weaponized in unprecedented ways (see e.g. Wu, 2010, 2018). For example, bots and bad actors have the capacity to “flood” public discourse with false or irrelevant information in order to manipulate the attention of news consumers and the course of public conversations. Trolls and troll armies can be enlisted to “participate in” and “contribute to” public conversations, but expressly for the purpose of derailing them. “Filter bubbles” that social media company algorithms help to create in an attempt to personalize and filter the information fed to users can limit what news a user sees and which public conversations they can participate in. Such bubbles may also have the effect of fragmenting public conversation into groups with like-interests that may not pertain to the issues of importance. The outsourcing of what counts as evidence worth discussing to personalization or other algorithms creates public conversations and groups (to which they pertain) that don’t (adequately) correspond to those that we would normally recognize as servicing the epistemic needs of the public involved. In short, social media makes it easy for individual people’s limited supplies of attention to be captured by matters of little importance to them in their capacity as citizens of a certain nation, or taxpayers in a certain town or region, or other social roles calling for a well-functioning public conversation. In this way, individual inattention to relevant evidence (which may not itself be *resistant* to this evidence) can lead to systemic conversational resistance to relevant evidence.

Our aim in this chapter is to illuminate the nature of relevance-based resistance to evidence and to better understand how this phenomenon can arise in public conversations, large and small. We propose to do this in two steps. First, we present a model of how public conversations are structured and what makes contributions to those conversations relevant. The latter explanation hinges on the thesis that certain bits of evidence are important for members of particular groups to have access to. Second, we outline two different ways for public conversations to develop relevance-based resistance to evidence. The first way involves the sort of “crowding out” of important information by unimportant information which we alluded to above. The second way that public conversations can develop relevance-based evidence resistance stems from the conflation of different public conversations and the groups they concern, which makes it harder to target the right evidence at the right individuals. This phenomenon, we argue, has been greatly exacerbated by the ways in which social media has changed our public conversations.

A Model of (Private) Conversation

We hope to illuminate the structure of public conversations by extending and applying an approach that has been used to illuminate the structure of ordinary, relatively private conversations. We will call this the “communal inquiries approach”. In this section, we start by providing a brief introduction to the communal inquiries approach.

Most of us have a sense of what (relatively) private conversations are: we can imagine ourselves having them with friends, family, colleagues, or strangers we have passing interactions with. Private conversations take place over definite stretches of time and have fairly definite groups of participants (though who is participating may change a bit over the course of a private conversation). For the most part, private conversations are sparked and sustained by the participants’ need to be social with one another because of their co-location (as when strangers in an elevator chat with one another during the ride, or when people mingle at a party) or in order to maintain their relationships to each other (as when family members call each other to “say hi”), or because of the participants’ need to get things done: to share information, to make plans, to give orders, and so on.

The communal inquiries approach takes the primary aim of conversation to be communal inquiry: conversations are aimed at sharing information in order to answer questions of interest to the participants.² We might, for instance, have a conversation about whether to go on a hike today or wait until tomorrow, or about whether it will be possible to plan an in-person conference again next summer.

One might worry that the communal inquiries approach does not cover the great variety of conversations and conversational purposes (e.g. small talk about how much the weather stinks, psychologically abusive tirades, banter, lovers’ sweet talk, etc.). Do the aforementioned strangers filling the silence in the elevator aim to share information in order to answer questions of mutual interest? Do family members who call each other with no news to report, but just because they want to hear each other’s voices have this kind of aim? We share these concerns, but we are setting them aside for now. This is because we are interested in applying the communal inquiries approach to *public* conversations. And, as we will explain in the next section, we think that public conversations do (at least often) aim at sharing information in order to answer questions of mutual interest.

Communal inquiries can be used to model, not only the aims of conversations, but also what is known as the “information structure” or “discourse structure” of conversations.³ Inquiries are structured in terms of the questions that constitute them. For example, consider the following inquiry (I):

- | | |
|---------------------------------------|-----------------------------------|
| (I) Q1. What does Lucy like? | |
| Q2. What does Lucy like to eat? | Q6. What does Lucy like to play? |
| Q3. Does Lucy like to eat dog treats? | Q7. Does Lucy like to play fetch? |
| Q4. Does Lucy like to eat dry food? | |
| Q5. Does Lucy like to eat wet food? | |

In the inquiry (I), Q2 and Q6 are sub-questions of Q1; Q3–Q5 are sub-questions of Q2 and Q1, but not Q6; Q7 is a sub-question of Q6 and Q1, but not Q2. Conversely, Q1 is a super-question of Q2 and Q6, which are, in turn, super-questions of Q3–Q5 and Q7, respectively. Being a sub-question or a super-question is a transitive property – so, for example, Q1 is a super-question of Q2–Q7, not just Q2 and Q6.

The inquiry is structured according to the super-question–question–sub-question relations which obtain amongst the questions that constitute that inquiry. The structure of inquiries, then, can be exploited to model the structure of conversation. Roughly, the contributions in a conversation attempt to provide at least partial answers to questions, which are either explicit or implicit, within the conversation. So, for example, a conversation based on inquiry (I), might go as in (C):

- (C) A: What does Lucy like?
 B: She likes to eat dog treats.
 A: What about wet food?
 B: No, she likes dry food.
 A: Does she like to play?
 B: She likes to play.
 A: I bet she likes to play fetch.
 B: Yes, yes, she does.

Notice how the conversation can proceed smoothly, without hiccups or repair, and remains rational and coherent, when it follows a structure that accords with the inquiry (I). Communal inquiries also provide a helpful model for how conversations are structured in terms of topics. The broadest question serves to set the “discourse topic”, the topic of the whole conversation, the “immediate” questions set the topics of the individual contributions, and the relations between the questions set the topic (“information” or “discourse”) structure of the conversation, generally.

The context in which the conversation takes place plays a considerable role in setting up our joint inquiries. The questions who Lucy is, whether Lucy is a dog, or whether the kinds of foods or activities Lucy likes are dog things as opposed to human ones, don’t come up in the course of the conversation. That’s because conversations occur in contexts which supply the needed background. A and B don’t need to settle those questions because A and B have already accepted answers to them and they’re aware that the other has too. In this way, A and B can presuppose that those questions are already answered for the purposes of their conversation. The standard way to put this is that these propositions⁴ – who Lucy is, that Lucy is a dog and that Lucy likes dog things – are part of the *common ground* of the conversation. If A and B already know who “Lucy” refers to, believe that she’s a dog and that dogs like dog stuff, and in addition, A and B both believe that the other believes these things, then these propositions are part of the common ground for their conversation. More generally, following Stalnaker (1978, 2002, 2014), a proposition is in the common ground of the

conversation if all parties to the conversation accept that proposition and presume that all other parties to the conversation also accept it.⁵

It is also important to note that most conversational contributions are proposals to *update* or *alter* the common ground in some fashion. Paradigmatically, if a speaker *A* asserts that *p*⁶ and no one objects, the proposition that *p* is now added to the common ground and is fair game for any other speaker to presuppose going forward. In our example (C), for instance, when *B* asserts that Lucy likes dog treats and *A* doesn't object to this and continues on with the conversation, the proposition that Lucy likes dog treats is added to the common ground. Further, when *A* contributes to the conversation by asking *B* whether Lucy likes wet food, she proposes that *A* and *B* continue the conversation by aiming to add an (partial) answer to that question to the common ground.

Public Conversations

Now we are ready to show how the communal inquiries approach can help illuminate public conversations. Public conversations differ from private conversations in a variety of ways. They last for an indefinite amount of time and, at least in principle, are open to anyone to witness or participate in. Some public conversations will involve debates at a relatively high level of abstraction or idealization, and hence may run along fine without an informed picture of what is going on in the world outside that conversation. A great many public conversations, however, are sustained in no small part by *news*. It is these we will be focused on in what follows.

News is not easy to define, but for present purposes, we can stick with a simple definition according to which news is a description of an important recent event or situation.⁷ What is discussed in an epistemically healthy public sphere are current events of general importance, or relevance, to the public in question: budget cuts at the local primary school, evidence of corruption in the national government, international sanctions being imposed against certain nations, and the like. Public conversations of this kind continue because they receive a continuous supply of news, at least some of which has a bearing on the broad question of how *we*, in our capacities as parents in this district, citizens of this country, or human beings in the world, are going to act.

One important aspect of public conversations is that they are also sustained by particular publics, so what is part one public conversation may not be a part of another. For instance, reports on the school budget cuts in our toy example from the introduction will be (or at least, should be) part of a public conversation for parents in the district. But these cuts are unlikely to be (nor, absent unusual circumstances, should they be) part of the wider public conversation among citizens of the country this school is located in. We take it, therefore, that in the broadest sense, the "public sphere" can host not just one public conversation, but many. Traditionally (prior to the widespread adoption of social media), these conversations were at least partially delineated by the different target audiences of different news providers. A national newspaper's target audience is, typically,

citizens of that nation⁸; it aims to provide news that is important for them. A magazine about the British Royal Family, in contrast, will primarily target fans of the Royal Family; it aims to provide news that is important for them. A school newsletter's target audience is the parents and teachers at the school; it aims to provide news that is important for them, and so on. Each of these streams of news help to sustain a different public conversation, although there will often be some overlap between them. In this pre-social-media scenario, a given public conversation would exhibit relevance-based evidence resistance if it became too focused on news that was less important or relevant for the target audience than other news that was thereby crowded out.

Using the communal inquiries approach, we can elaborate on this rough-and-ready way of distinguishing different public conversations from one another. For we can distinguish them by the questions that structure them. For instance, in the public conversation sustained by journalism focused at the national level in Sweden, one type of super-question–question–sub-question structure might run along the following lines: *What things are happening now in Sweden or in the rest of the world that are important for people in Sweden?* Sub-questions might then include: *What is happening now in the Swedish government? How are Swedish sports teams performing in competition? What are foreign governments doing that affects Sweden?* And sub-questions to these might include: *How did the different parties in the Swedish government perform in the latest opinion measure? How is Maja Stark doing in the US Open?* Structuring questions like these are not usually asked explicitly in public conversations. They are implicit in the context of the conversation, which inquires into a broad question whose answers are ever-evolving, along the lines of: *what is happening that is important for Swedes and how shall we (Swedes) react to it?* At any given point in the conversation, previous contributions have implicitly introduced a wide range of sub-questions.

It is also clear that the notion of *common ground* is important for understanding the structure of public conversations, since, like private conversations, they do not occur in a vacuum. For instance, a news report on Swedish eating habits, published in Sweden, is likely to presuppose what *fika* is, not pausing to explain that it is a coffee and cake break before going on to say that people are doing it more or less often at their workplaces. A news report on the same topic published in the US or UK, on the other hand, would be much less likely to take this information for granted. Why? Because it is common ground in Sweden what *fika* is, but not elsewhere. Moreover, as we will explain in more detail in a later section, contributions to public conversations are understood as proposals to update or alter the common ground.

These comments are enough to suggest that the communal inquiries approach is at least a good starting point for theorizing public conversation. But some amendments are needed. The salient and important questions, at this point, are:

- 1 What kind of communal inquiries are public conversations engaged in – that is, what kind of questions are public conversations aiming to answer?

- 2 What is *public common ground* – that is, what variation on the notion of common ground is suitable for modeling conversations whose participants are as numerous, diverse, and physically dispersed as in public conversations?
- 3 What kinds of conversational contributions are significant and permissible in public conversations?

We'll consider each of these questions in turn (no meta-joking intended!). Once we've elaborated on the structure of public conversations, we will be in a position to separate two different sources of potential relevance-based resistance to evidence in public conversations: one that was a threat to public conversation before social media became a central platform for these conversations, and one that has arrived along with (or has at least been greatly exacerbated by) social media. We will return to this discussion later in later sections.

The Aims of Public Conversations and Questions Under Discussion

Both Stalnaker (1978, 2002, 2014) and Roberts (2004, 2012) have suggested that the broad aim of all inquiry is to answer a certain question. This is the “Big Question” in Roberts’ terminology: what is the way things are? As illustrated above with the Lucy example, typically, conversations are concerned not only, and not even primarily, with the Big Question (BQ), but rather with more specific sub-questions of the BQ that arise because of the practical goals and interests of the conversational participants combined with features of the context of conversation. We also suggested, with the Swedish national journalism example, that public conversations are concerned with quite broad questions, though not as broad as the BQ. They are concerned with what we will call “Journalistic Big Questions”. We use this label to reflect the fact that journalists whose target audiences correspond to the participants in a given public conversation often try to answer these questions, along with their more specific sub-questions. Here is a schematic statement of a Journalistic Big Question (JBQ), which would be filled in differently for different public conversations:

The Journalistic Big Question (Schema)

What is new that is important for Gs, in general and in their capacity as Gs, and how shall we Gs react to that news?

To return to our earlier example, one value for “G” is *Swedish citizens*. One public conversation is structured around the following JBQ: *what is new that is important for Swedish citizens, in general and in their capacity as Swedish citizens, and how shall we, Swedish citizens, react to that news?* Swedish news media at the national level provide (some, partial) answers to the first part of that question and introduce sub-questions (often implicitly) to which they also often provide (some, partial) answers. And Swedish citizens may try to provide (some, partial) answers to the second part of that question, *how shall we react?*

The JBQ schema (and hence, the specific JBQs) has two elements that require further elaboration. One is the idea of an event or situation being *important to members of a certain group, in general and in their capacity as members of that group*. The other is the nature of the question, *how shall we react?*

Let us start with the first element. By “in general”, we mean to express a generalization about the group in question: for instance, an event may be important to Swedish citizens in general, without being important to every Swedish citizen, or to any specific number or proportion of Swedish citizens. By “in their capacity as members of the group”, we mean that the importance of the event/situation for someone is relative to their role as a member of the group. For instance, a report on Sweden’s current prospects for meeting its long-term energy needs may not be very personally important for a certain Swedish citizen who is elderly and unconcerned about a future they will not be a part of. But it may still be important for them in their role as a Swedish citizen, since it can help them understand the current state of their society and make informed decisions about voting and other activities.

Finally, concerning “importance”, we have to rely on the reader’s intuitive understanding of the idea that some events, situations, trends, and changes are more important for various groups than others. As we will discuss in more detail below, spelling out what this means is a critical task for achieving a fuller understanding of relevance-based resistance to evidence in public conversations. Journalists, who contribute news reports to public conversations, often stress the weightiness of deciding what is important. But what importance amounts to is difficult to spell out. The American journalists Kovach and Rosenstiel (2014, especially [Chapter 8](#)) assume that journalists should report on happenings that are *significant* for their audience, without saying much about what makes an event, situation or the like significant for a given audience. The Swedish journalist Fichtelius (2008, [Chapter 2](#)) lists importance (*viktighet*) for the audience as the number one criterion for journalists in choosing what to report on. He suggests that important events and changes are those that fundamentally affect people’s living conditions, and those that have an impact on people’s ability to understand the world around them. Both of these assessments seem intuitively plausible, but each also leaves much unsaid about what importance for a certain group consists in.

Public conversations address the question of what is new that is important for a certain public group, but that is only half of each conversation’s JBQ. The other half is the question of how “we” – the members of the group the conversation concerns – intend to react to such news. Clearly, what happens in the public sphere is not mere reporting of important news, but also reacting to that news, and advocating for different types of response. Given this, it seems reasonable to view part of the JBQ for any given public conversation as a kind of *practical* inquiry: an inquiry into what is to be done.⁹

Contributions to public conversations do not only, and often not even primarily, concern questions as broad as the JBQ. They also address the JBQ by addressing more specific and immediate sub-questions of the JBQ, what we will

call “journalistic questions under discussion” (JQUDs). This is because (partial) answers to JQUDs constitute partial answers to the JBQ. To briefly illustrate, let us return to our example above involving the public conversation sustained by Swedish national news. The JBQ of that conversation is: *What is new that is important for Swedish citizens, in general and in their capacity as Swedish citizens, and how shall we, Swedish citizens, react to that news?* Sub-questions of this JBQ might include the following JQUDs: *How are Swedish sports teams performing in competition? How should we react to the performance of Swedish sports teams?* A public conversation involving Swedes may center on answering these JQUDs and, in so doing, help to answer the JBQ.

Public Common Ground

Above we followed Stalnaker in saying that some bit of information is in the common ground of a conversation if and only if all parties to the conversation accept that information and presume that all other parties to the conversation also accept that information. But in a public conversation, there needn't be a definite collection of all the parties to the conversation, nor need the various parties in general know who the other parties are, where they are, or when they join the conversation. This raises questions about in what sense public conversations have a Stalnakerian common ground.

If we restrict our focus to public conversations before social media, it is not so difficult to envision a public corollary of common ground. When the main way for non-professional journalists to contribute to public conversations was by writing to the “letters to the editor” pages of newspapers and magazines, both professional journalists and members of their target audiences could presume that the others engaging in public conversation with them were readers of a certain publication, or perhaps readers of just a few mainstream publications. They could presume that all of them accepted that the evidence presented in the reports of those publications was available. They might not presume that all of them accepted that the reports were true or the evidence genuine, but at least they could take for granted that the others participating in the conversation knew what had been put forward.

This is still something of an idealization. For it is not clear that any individual, even in this pre-social media era, was in a position to keep track of all of the updates to a given public common ground, even just considering a few mainstream papers. For instance, very few people in the UK read not just the *Mirror*, but also the *Guardian*, the *Times*, the *Mail*, the *Telegraph*, the *Financial Times*, and the *Sun*.¹⁰

Here is a way to reduce the degree of idealization in the notion of public common ground. Let us allow that participants in these kinds of pre-social media public conversations did not mutually accept that each specific bit of evidence had been presented and discussed in the ways it had been. Still, they probably did mutually accept that whatever stories and letters were in fact recorded on the pages of relevant publications (e.g. those aimed at citizens of the UK, or Sweden)

had been put forward and were available to be checked. We can think of those stories, letters, etc., as constituting the public common ground.

We also want to stress that public common ground, as we understand it, can encompass not just propositions, but also evidence for the truth of various propositions. In private conversations, these will typically coincide: according to Stalnaker (1978), if we both witness a goat walking into the room, then it will be common ground thereafter that there is a goat in the room. We do not need to track our *evidence* for there being a goat in the room (namely, that we both saw it come in) separately from our mutual acceptance of the proposition *that there is a goat in the room*. If that's right, then this distinction can be safely elided in trying to understand private conversations. In public conversations, on the other hand, there is more scope for dispute about the value of certain bits of evidence – even when we all accept that we all have access to these bits of evidence. For example, participants in a public conversation may mutually accept that photographs or videos that appear to show police brutality taking place have been publicized, without its being mutually accepted that police brutality in fact took place. So it is important to allow that evidence, not just propositions, can be a part of the public common ground. We will treat evidence as a part of the public common ground so long as it is mutually accepted that the evidence is easily available to members of the relevant group, in the sense of its being accessible without too much effort (e.g. by looking at a widely circulated newspaper, or perhaps by going back into the newspaper archive).

A public common ground, as we understand it, thus includes a JBQ, a set of JQUDs, a set of mutually accepted propositions, and a body of evidence which is mutually accepted to be easily available to members of the relevant group.

Moves in Public Conversations

Having defined the public common ground, we can now offer a simplified model of dynamic public discourse and what it is that different “moves” in public conversations contribute to those conversations. In an ordinary conversation, there are a variety of different ways of contributing to the conversation. For example, a conversational participant can greet someone, compliment them, assert some bit of information, ask a question, make a request, provide a guess, disagree with someone, demand something, etc. This is also true of public conversations: there are a variety of different ways of contributing to them. Importantly, however, what it is to assert something, make a request, etc. in a public conversation is different from what it is to assert something, make a request, etc. in a private conversation.

One claim we made earlier is that public conversations are sustained by journalism, or a steady supply of news, and we are now in a position to make this claim more precise: one of the primary ways of contributing to a public conversation is by publishing (and distributing) a bit of news. Another important way of contributing to public conversation is by reacting to the news, and advocating for different types of responses to it. The public discussion of the news includes

publicizing, scrutinizing, criticizing, verifying, elaborating, and contextualizing putative information about matters that are important to members of various groups. Public conversations are, at least in pre-social media settings, largely sustained by these types of contributions.

PUBLICATION OF NEWS AS CONTRIBUTIONS TO PUBLIC CONVERSATIONS

In the first instance, we propose that news stories serve to update the public common ground by making certain pieces of evidence easily accessible. Such evidence can be made available by means of a news story in a variety of different ways: via reported testimony, direct observation (i.e. testimony by the journalist), the inclusion of pictures and videos, links to scientific or governmental reports, etc. We'll treat all of these as ways of updating the public common ground. Thus, for example, consider a news story written by a journalist for a local newspaper that reports, based on the journalist's eyewitness testimony, that a fire burned down the local cinema. Suppose further that this story is printed in the local newspaper and that the print version of the newspaper has had sufficiently widespread distribution that publicity of the news story has been achieved. In other words, members of the local target audience *G* presume both themselves and the other members of *G* to have easy access to evidence that a fire burned down the local cinema. In this case, the public common ground is updated to include the evidence of a fire having burned down the local cinema.

In publishing the story (via her role at the local newspaper), the journalist offers a partial answer to the question, *what is new that is important to residents of this town, and how shall we, the residents, react to this news?* This is the JBQ of this public conversation. Her contribution itself answers the JQUD or the more specific sub-question of the JBQ: *what happened to the local cinema?* In offering a (partial) answer to the JBQ and the JQUD, the journalist proposes to add the evidence found in the story to the public common ground. Supposing that others don't object, the evidence found in the story is added to the common ground.

OTHER CONTRIBUTIONS TO PUBLIC CONVERSATIONS

As with ordinary conversational updates, there can be objections to proposals to update or updates to the public common ground: these can come from other reporters, readers, editors, ombudsmen, etc. And journalists can subsequently retract all or parts of their stories, thereby canceling (or at least attempting to cancel) the proposal or withdrawing evidence from the public common ground.

Another important kind of contribution to public conversations is to propose to set up a new JQUD in the conversation: to propose that the conversational participants aim to (partially) answer that JQUD. Such conversational moves set agendas and new topics for the public conversation to address. They are often coupled with informational updates. For instance, a recent Guardian "exclusive" reports that some EU organizers of international tours for schoolchildren expect

a sharp decline in tours to the UK due to heightened post-Brexit border restrictions.¹¹ Reporting on this was an attempt to update the public common ground with evidence for these tour operators having these concerns. But it is clear that another aim of the report was to bring up a series of questions to be addressed going forward: *Will post-Brexit restrictions stop school tourism from the EU to the UK? Will this have a negative effect on the UK's reputation and influence abroad? What will be the economic impact of this in the UK?* And so on. If these proposals to address new JQUDs are accepted, they help to structure the ongoing conversation and, accordingly, the public common ground.

One type of JQUD that contributions may set up are practical questions about how the group at issue might respond to the information being discussed. For instance, continuing with the example introduced in the previous paragraph, upon probing and learning about the negative economic impact of less school tourism from the EU to the UK, a conversational participant might propose to set up the question: *what are we (the affected UK residents) going to do about this?* This might motivate or incite calls to action of various sorts, which are also parts of the conversation. Other reactions to the news and answers to the question of *how should we react?* won't necessarily be so measured, for it may be that the appropriate way for the group to react is with outrage, sadness, or a host of other collective emotional responses.

There are many other important ways of contributing to public conversations, not least of which are ways distinctive of post-social media public conversations. We return to some discussion of these in the final section.

Relevance-Based Resistance to Evidence: Pre-Social Media Public Conversations

With a rough model of public conversations now on the table, we turn next to the question of what makes contributions to such conversations relevant. In particular, we are interested in what makes them have the kind of relevance whose absence presents an epistemic problem of the kind illustrated in the introduction.

Over the course of this section and the next, we will show that, as difficult as this question is when it concerns the pre-social-media scenario, it is even more difficult now that so much public conversation takes place on social media. Pre-social-media, different public conversations were largely kept organized, coherent, and separate because there were different physical, print, or virtual spaces in which they took place. People could respond to news publicly by writing letters to the editors of newspapers or magazines, by holding public demonstrations outside government buildings, or, in later years, by blogging or by posting to newsgroups or comments sections of online publications. For the most part, one's choice of where and how to speak publicly in response to news would make clear which public conversation one was participating in. For example, a letter to the editor of *Royal Life* clearly contributes to a different conversation than a letter to the editor of *The New York Times*; a demonstration outside a local county office contributes to a different conversation than a demonstration outside the national capitol building.

In contrast, tweets, Facebook posts, and other posts on social media typically do little to clarify which conversation they contribute to.¹² Users' social media feeds may contain all manner of discussion, from local to international, special interest to general. Thus, in today's media environment, there are at least two different sources of relevance-based resistance to evidence. One is a traditional source: journalists, or news reporters, may choose to report less relevant news to their target audience, and audience uptake may make it difficult for more relevant news to gain air space. The other is a problem that is new, or at least greatly exacerbated by the role of social media in public conversations: neither news reporters nor discussants may really know which conversation they are contributing to. This might lead to contributions that are more relevant to one conversation eventually dominating another conversation to which they are less relevant, or even to the distinctness and coherence of conversations breaking down. In the latter case, there may not even be a genuine fact of the matter as to which public conversation one is contributing to, or that one is even contributing to *any* coherent public conversation.

The latter problem will be the subject of the next section. In the remainder of this section, we continue to consider public conversations prior to social media. First, we will develop an account of what makes contributions relevant to such conversations, using the extended communal inquiries model of conversation that we developed above. Then we will use this account to point out different ways in which relevance-based resistance to evidence can arise in public conversations.

Roberts Relevance

A promising way of understanding the relevance of contributions to a given public conversation is in terms of relevance to the JBQ and JQUDs that structure those conversations. According to this understanding, relevance has many important roles. It ensures the conversation remains organized (appropriately structured), "on topic", coherent,¹³ and provides a measure of the rationality and epistemic health of the conversation and conversational contributions.

In Roberts' version of the communal inquiries approach to conversation, relevance is defined for conversational contributions in terms of the *immediate question under discussion*, or what we will call the "question currently under discussion". When a conversational contribution takes place, there is typically a question the participants are currently concerned with answering. According to Roberts, a conversational contribution is relevant to the conversation if it is either a partial or total answer to the question currently under discussion, or is part of a strategy to answer this question.¹⁴ Drawing on our earlier example involving the conversation about Lucy, the contribution to that conversation made by, say, A's asking *what about wet food?* is relevant because it introduces a question that may help to answer the question currently under discussion, namely *what food does Lucy like?* B's subsequent contribution in answering A's question, *No, she likes dry food*, is relevant because it answers the question introduced by A, and hence currently under discussion, namely *what about wet food?*

B's contribution, in saying that Lucy likes dry food, also partially answers the QUD from the moment before, *what food does Lucy like?*

Relevance in this sense plays an important role in ensuring that each conversational contribution adheres to the structure of an inquiry (the inquiry that is thereby undertaken in that conversation), remains on topic, coherent, rational, and epistemically healthy. As long as each conversational contribution is relevant, each contribution will partially answer or help to address QUDs that stand in the appropriate sub- and super-question relations to one another. This feature of Roberts' notion of relevance helps to ensure these good-making features of conversations. It also provides (at least the beginnings of) an account of how conversations themselves can be relevant to one another and connected, in terms of the continuity of the inquiries involved. This is an especially important feature of Roberts' model in considering its application to public conversations, since maintaining such continuity is all the more significant for conversations that are less physically or spatio-temporally continuous.

With these preliminaries in place, we can define a correlate of Roberts' notion of relevance for a contribution to a given public conversation as follows: a contribution to a public conversation with JBQ q is Roberts relevant if and only if it is relevant to the question currently under discussion, where that question is a sub-question of q . A contribution is relevant to the question currently under discussion if it introduces a partial answer to this question or is part of a strategy to answer this question.

What distinguishes the relevance of contributions in public conversations from Roberts' ordinary notion of relevance is that contributions to public conversations must at least partially address a question currently under discussion which is a sub-question of the JBQ of the given public conversation – that is, they must at least partially address a JQUD. Recall that each JBQ is not nearly as broad as Roberts' and Stalnaker's BQ – *what is the way things are?* Further, in order to count as a JQUD (i.e. as a sub-question of the JBQ of a given public conversation), a question must pertain to what's important to the public involved (i.e. to the "Gs" in our formulation of the JBQ schema above). For example, what Lucy likes, though it is a sub-question of the BQ, is not a sub-question of the public conversation whose JBQ is *what is new that is important for Swedish citizens in general and in their capacity as Swedish citizens, and how shall we (Swedish citizens) react to it?*

Which public is involved and what's important to them as a public is doing quite a lot of work in this initial definition of relevance for public conversations (and it will continue to do so in subsequent developments below). These two conditions restrict quite drastically which questions and answers are even candidates for counting as relevant contributions. One way to be irrelevant is to fail to be an answer to or to introduce any JQUD – as would likely be the case for any contribution about Lucy to the Swedish public conversation. However, these conditions aren't doing all the work. Our Roberts-inspired definition allows another way to be irrelevant that is tied more directly to the JQUD. Suppose a particular JQUD – *how did the Swedish government perform in the latest opinion measure?* – has been established in the context of a newscast, when a newscaster

abruptly introduces the question of how Maja Stark is doing at the US Open, or observes that housing prices have been on the rise in Sweden, or says that the government scored poorly in the November 2019 SCB poll. These contributions are of importance to Swedes, but they are not relevant relative to the JQUD currently under discussion.

This is a good start on a definition of relevance in a public conversation, one which captures two key ways of being relevant in public conversations. But it still won't quite do. For we also want to capture the sense in which some JQUDs are more important than others to a given public, so that raising them is a *more relevant* contribution to answering the JBQ pertaining to that particular public. For example, having an answer to the JQUD, *how did the Swedish government perform on the latest opinion measures?*, is (arguably) more important to Swedes in their capacity as citizens of Sweden than having answers to JQUDs like *how are Swedish sports teams performing?* or *what's Youngblood's latest song?* The notion of importance we're after is gradable, and it would be worthwhile to enrich the JQUDs falling under the JBQs with a ranking of importance. Some sub-questions tell us more, or more that matters to us, about how to answer the JBQ that we are pursuing. This means each contribution to a public conversation is conversationally relevant to a greater or lesser degree, depending on how important the question it addresses is to members of the public in question. A contribution might be relevant, in Roberts' sense, to the JQUD it addresses. Yet that JQUD might be of relatively little importance or relevance to addressing the JBQ, even if it's relevant enough to clear the bar for offering a partial answer to that question. Relevance to a public conversation, we are suggesting, is a multi-faceted phenomenon.

This is, in effect, to put even more of a burden on the missing account of what's important to members of G in their capacity as members of G. In this chapter, we are leaving this core notion unexplained and appealing to the reader's intuitive understanding of it. One thing suggested by the discussion of this section is that further philosophical exploration of the notion of importance to members of a group in their capacity as members of that group is needed. Although we have not yet given such an account, we have sketched the structure of a broader picture of relevance to a public conversation within which one could be developed.

Given this understanding of relevance, relevance-based resistance to evidence arises in a given public conversation when the QUDs being addressed in that public conversation are predominantly irrelevant or less relevant or important than other open JQUDs that might have otherwise been addressed in that public conversation. For example, consider the public conversation with a JBQ involving UK residents. This public conversation might become dominated by discussion of Royal intrigues rather than post-Brexit trade agreements, thereby preventing UK residents from discussing and learning of evidence of importance to them in their capacity as UK residents. In such a scenario, a JQUD of less relevance to the JBQ and importance to UK residents (*what is the Royal Family up to?*) is dominating the public conversation, preventing due consideration to the more pressing post-Brexit one. Similarly, even relative to more specific JQUDs about the Royals, answers to a less relevant sub-question like *how does*

the Queen feel about Meghan Markle? might be crowding out answers to more relevant sub-questions like, *how much are taxpayers spending to support the Royal Family?* (This is assuming that the Queen's feelings about Meghan Markle are less important for residents of the UK in their capacity as such than is taxpayer support of the Royal Family.) Relevance-based resistance to evidence can happen at different structural levels of conversations, likely with worse effects the higher up in the structure it occurs.

A New (or Exacerbated) Form of Relevance-Based Resistance to Evidence

In the previous section, we took for granted that it is in general clear to participants in public conversations *which* JQUD a given contribution is answering and *which* public conversation a given contribution is a contribution to. It seems to us that prior to social media, this was generally clear – surely not in every case, but generally. And even in most cases where it may not have been clear, there was still likely to be a fact of the matter about which conversation was being contributed to and which JQUD was being answered.

This is because the ways of contributing to public conversations prior to social media typically made clear which public conversation was being contributed to, in the way we described earlier. But the advent of social media has drastically changed the way news is reported, spread, and reacted to. This, we propose, has made it more difficult for participants in public conversations to ascertain which JQUD a given contribution replies to, or which conversation it is part of. It has also made it more difficult for contributors to direct their contributions at particular JQUDs and conversations. In addition to these epistemic difficulties, moving public conversations to social media may even be breaking down the structure and coherence of, and the boundaries between, different public conversations. If so, we may be moving toward a scenario in which relevance-based resistance to evidence is guaranteed, because there will no longer be the conversational structures in place that are needed to keep public conversations on track, coherent, and distinct.

To develop these ideas, let us start with a brief description of how social media has changed public conversations. We said before that news (or, more accurately, news reporting) is a sustaining force in public conversations. A great many people now get their news, at least partly, by way of social media.¹⁵ This has changed the production, distribution, and consumption of news in profound ways. Traditionally, consumers of news played a mostly passive role in the production of news, but with the advent of social media they now have a potential audience, platform, and social network, which give them the capacity to become active producers and distributors of news. Some would-be consumers, unwittingly or not, are better characterized as “citizen reporters”, breaking news before any news organization does.¹⁶ More broadly, those who would traditionally have been consumers of news with relatively limited platforms for public reactions to that news can now engage publicly with great ease. At the press of a few buttons, they can upload photos and videos, retweet or reshare news items, respond to,

add to or comment on news items, and make calls to action concerning the news. This has drastically expanded the number of producers of news and reactions to the news, leading to a far greater volume of (purported) contributions and conversations overall.

Even if content is produced by a professional journalist or news organization, the process of distributing the news increasingly relies on would-be consumers' decisions to engage with and/or spread news reports further on social media. This is because news is distributed on social media by way of (i) social media companies' ranking algorithms posting news items in users' "news feeds", where these "decisions" likely depend on previous engagement with the items and (ii) social media users retweeting or resharing those news items. In addition, traditional producers – i.e. those who are employed as journalists by news organizations or run their own – must continuously update and nuance their stories in response to their spread and reactions online, as well as report on what is happening in the public online conversation, which is news in its own right.

This means that these sorts of contributions – posts to social media by traditional consumers of news, posts of news stories by ranking algorithms into the news feeds of social media users, and the retweeting/resharing of news stories – have an unprecedented role in public conversation. Not only do traditional consumers have a greater capacity to participate in public conversations online by engaging in traditional sorts of contributions to public conversations, but they are now deeply involved in producing the primary driver for sustaining public conversations – news reports.

One upshot of this change in the way news is produced and distributed is that the old clues as to which public conversation a news report is a contribution to are either absent or less prominent. Particular journalistic organizations still have target audiences and still offer answers to JBQs concerning those audiences. But consumers who see the stories these organizations produce in a Facebook or Twitter feed, for instance, may not notice which publication the report comes from, or take account of who the target audience for that publication is. They consume news of varying degrees of public importance mixed in with a fairly undifferentiated stream of friends' photos and updates, videos of funny or cute goings-on, (personalized) advertisements, and others' reactions to all of these things. As a result, it will be much less clear to potential participants in public conversations whether a given news report they see on social media is supposed to be important for Swedish citizens, or for residents of Uppsala, or for those who keep dogs, or for other groups. Similarly for citizen-reporters posting to Facebook and the like: even if these contributors make explicit statements concerning for whom their news is important, consumers or algorithms will ultimately decide whose attention gets focused on what.

Even if it is difficult to distinguish different public conversations on social media, one might think that, nonetheless, there are still distinct public conversations. Traditional news sources still direct their reports at distinctive target audiences and address distinctive JBQs, and social media platforms and users have created some fixes for structuring conversations online (e.g. hashtags). Perhaps this is enough to ensure the continued flourishing of something like the

pre-social media kinds of public conversations, even if social media users are not well positioned to contribute to them. This may be so, but for reasons we already noted, matters are not so simple. Traditional news sources now rely on social media users to form part of their distribution apparatus, and to alert them to events and situations that are important for their target audiences. These sources often cannot produce reports that are relevant to their JBQs without taking account of what is happening on social media. This means that professional journalists, just as much as ordinary social media users, must assess which parts of the jumbled conversations on social media are relevant to the public conversations they are helping to drive. If social media becomes focused on certain events or situations, these are likely to receive increased coverage from traditional news sources, even if they are less important for those sources' target audiences than other matters. In this way, the difficulty of keeping public conversations distinct on social media can lead to less relevant contributions crowding out more relevant ones, even in traditional venues.

As public conversations move more and more onto social media, a larger concern is that the difficulty users have in *knowing* which conversation a post contributes to, or in *directing* their contributions at a specific conversation, may lead to a situation in which there no longer are distinct conversations addressing the kinds of JBQs we have discussed. News publications may still target, for instance, Swedish citizens in their capacity as citizens, but the conversation to which they contribute will no longer be organized around a JBQ like, *what is new that is important for Swedish citizens...etc.*? Instead, in the extreme case, they will simply be contributing to the same undifferentiated online discussion as everyone else. This discussion might have something like the BQ as an organizing question, but no sub-questions concerning matters of importance to particular groups. Instead, it would be structured by sub-questions raised by whatever contributions receive enough attention to keep the topic in people's feeds. Nothing makes any of these sub-questions more or less relevant (to the BQ) than any others. In one way, this is a situation in which relevance-based resistance to evidence cannot arise in the public conversation (at least at the level of what is to be discussed), since everything is equally relevant. But far from being a nice solution to the problem, the merging of public conversations is more like the logical extreme of relevance-based resistance to evidence. With no remaining fact of the matter concerning what is more important than what for conversational participants, and thus no facts about what is more relevant to contribute to the public conversation, the public conversation is left to blow with the winds of what grabs people's attention. It is unclear what role such a conversation can play in the social and political functioning of specific societies.

Conclusion

In this chapter, we have introduced a rough-and-ready model of the dynamics of public conversations, and in particular of those public conversations sustained by journalism. We did this by modifying certain models of private conversations,

integrating the notions of journalistic big questions, journalistic questions (currently) under discussion, and the evidential common ground. This allowed us to define two notions of relevance for public conversations. The first of these had to do with whether an update to the common ground either is or contributes to an answer to the journalistic question currently under discussion. The second had to do with whether the question at which a given update to the public common ground is aimed is important to the relevant public. To the extent to which it is less important to that public than other questions which could be discussed, we take that contribution to be less relevant than other potential contributions to the public conversation.

Having introduced these twin notions of relevance to a public conversation, we then set out to understand how public conversations can become structured so as to lead them to resist available evidence. One of these ways is rather intuitive on the face of it: a public conversation can become fixated on matters of lesser importance to the relevant public. The challenge is to better understand this notion of importance for a given group, to better understand what makes certain evidence important for members of a group to have available to them *qua* members of that group. While we have not tried to answer this question, we do hope to have highlighted the interest of it for better understanding the nature of knowledge resistance in public conversations. The other way that public conversations can become structured lead them to resist available evidence, we suggested, is by means of a breakdown in the differentiation of audiences and conversations. For if there are no longer constrained publics with relatively well-defined epistemic interests, it is unclear whether it will make sense to talk about evidence as important for one or another group. While perhaps less intuitive than the first sort of structural knowledge resistance, this second kind of resistance may be even more worrisome at present, given how social media is rapidly reshaping the distribution of news in ways which interfere with the traditional methods of defining an audience.¹⁷

Notes

- 1 It also requires empirical study. For example, Durante and Zhuravskaya (2016) test the hypothesis that “politicians may strategically time unpopular measures to coincide with newsworthy events that distract the media and the public”, in the context of the Israeli–Palestinian conflict. They “find that Israeli attacks are more likely to occur when U.S. news on the following day are dominated by important predictable events”. They argue that the strategy aims at “minimizing next-day coverage, which is especially charged with negative emotional content”. If their analysis is sound, this would be an instance of politicians aiming at creating relevance-based resistance to evidence in the Israeli public conversation, since important but predictable events in the US are arguably not sufficiently important in the Israeli context to merit being discussed more than, or to the exclusion of, the attacks in question.
- 2 See, especially, Stalnaker (1978, 2002, 2014) and Roberts (2004, 2012).
- 3 Such structure has been theorized in a variety of different ways. For different options, see Stalnaker (1978, 2002, 2014), Sperber and Wilson (1986), Clark (1996), and Roberts (1996, 2004).

- 4 By “proposition”, we mean the kind of thing that can be believed, doubted, denied, asserted, and so on. For example, one might believe *that Lucy is a dog, that Lucy likes kibble*, and so on. Alternatively, one might doubt these things, or even reject them. What one is believing, doubting, and so on are things we refer to here as “propositions”.
- 5 We’ll leave it at the intuitive level what “acceptance” amounts to. Following Stalnaker, we take this to be a genus of attitudes which includes both full-on beliefs and weaker ones like assuming for the sake of conversation.
- 6 In the locution, “asserts that p”, “p” is a schematic variable: the idea is that you could fill in any declarative sentence in place of “p”.
- 7 See, for instance, Fichtelius (2008, pp. 16–18) on the difficulty of defining *news*. Note that in offering this rough-and-ready definition of news, we are not weighing in on the question of “news values”: what makes a recent event worth reporting on for journalists. (For a survey of this topic, see Harcup & O’Neill, 2017.) The question of news values is closely tied to the question of what events or situations are *important* for various groups of people.
- 8 In fact, it is probably broader than this, including, for instance, long-term residents who are not citizens. For the most part, when we use the term “citizens”, we intend this broader group, but we use “citizens” for simplicity.
- 9 If the public conversation concerns a group of people organized in a direct form of deliberative democracy, the conversation itself might produce a definitive answer to this part of the question as concerns a certain piece of news. For groups organized in representative democracies, this part of the inquiry might coalesce into stable public opinion and influence voting and other political actions accordingly (cf. Habermas, 1989; Ferree et al., 2002; Siegel, 2021).
- 10 This might be one of the reasons why journalism is so prone to brand-loyalty: restricting oneself to a single news-source yields the more cognitively tractable task of keeping track of a more restricted public common ground.
- 11 <https://www.theguardian.com/education/2021/jun/04/school-trips-to-uk-from-cu-could-halve-brexite-hits-cultural-exchanges>.
- 12 Granted, some posts will include further features or information like hashtags which, on the face of it, seem designed to indicate which questions these posts are germane to. But, as we see it, hashtags like *#freecritney* are typically much clearer about which JQUD the post they are affixed to is contributing to than they are about which JBQ they take this JQUD to fall under.
- 13 See Hobbs (1985), Kehler (2004), and Linell and Korolija (1997), amongst many others.
- 14 See Roberts (2012, 6:21).
- 15 Reuters Institute Digital News Report 2020 found that 26% of people across all national markets and all age groups chose “social media” to answer the question: Which of these was the MAIN way in which you came across news in the last week? 38% of those aged 18–24 chose social media as their answer. The 2020 survey found that in the UK 39% of respondents access news through social media; in Sweden, 50%; in the US, 48%; in Canada, 53%; in Hong Kong, 66%; in the Philippines, 68%.
- 16 Consider, for instance, the video of George Floyd’s murder posted to Facebook by high-school student Darnella Frazier. (Frazier later received awards from PEN America and the Pulitzer Prizes for her documentation of the event.)
- 17 For helpful discussion and feedback, our thanks to Robyn Carston, Joshua Habgood-Coote, Fintan Mallory, Jessie Munton, Matthew Stone, and Åsa Wikforss. Thanks as well to the participants in the Online Disinformation Workshop at the University of Bologna. We are grateful to Tove Fäldt for excellent research assistance. Work on this chapter was supported by a Swedish Research Council grant (VR2019-03154).

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7 Responsiveness to Evidence: A Political Cognition Approach¹

*Nathaniel Rabb, Małgorzata Kossowska,
Thomas J. Wood, Daniel Schulte,
Stavros Vourloumis and Hannes Jarke*

Introduction

Why do people believe things that aren't true and refuse to believe things that are? In this chapter, we approach the question through the lens of political cognition, a cross-disciplinary effort to understand how people make judgments of political import using the tools of cognitive psychology and experimental political science. The study of political cognition deals with the mental representations (beliefs, prior knowledge) people use as political actors. We explore the psychological determinants of political judgment to contemplate how best to encourage responsiveness to evidence. In a democratic society, citizens are expected to make informed choices, so understanding how to make them more receptive to evidence is critical. This holds particularly true because of the transition to high-choice information environments (Van Aelst et al., 2017) and the increasing prevalence of misinformation and disinformation. Whether an individual updates her beliefs in accordance with information in her environment can depend on a host of factors including the valence or salience of the information, her beliefs about the information's source, her prior commitments to counter-evidential beliefs, and her cognitive predispositions.

Partisan Cues

To gain traction on the difficulties this complex problem space creates, we first consider perhaps the most stable finding in recent research: people make many judgments along partisan lines. They do so when assessing policies (Colombo & Kriesi, 2017) but also when judging facial attractiveness (Nicholson et al., 2016), awarding scholarships to high school students (Iyengar & Westwood, 2015), choosing which light bulb to buy (Gromet et al., 2013), or deciding who sorts shapes better (Marks et al., 2019). They do so inside (Jerit & Barabas, 2012) and outside (Jacobson, 2010) of the laboratory, whether partisan associations are experimentally manipulated (e.g. Ehret et al., 2018) or partisan affiliations are measured (e.g. Gaines et al., 2007). They judge policy proposals associated with their own party more favorably irrespective of the substance of the proposal (e.g. Cohen, 2003; Satherley et al., 2018). And perhaps most startlingly, in the US, partisanship predicts consequential COVID-related health behaviors even when

controlling for a host of factors including determinate risk of poor COVID outcomes (Allcott et al., 2020; Gollwitzer et al., 2020).

The tendency to form and favor in-groups is well documented (Balliet et al., 2014) and seems to be at the bedrock of human behavior (Dunham, 2018). Partisan effects on judgments could therefore be held to show that people unthinkingly parrot the beliefs of their groups. But another interpretation follows from claims many psychologists would find uncontroversial. First, the notion that *individual cognition is meant to serve communal action* enjoys growing support (e.g. Heyes et al., 2020; Mercier & Sperber, 2011; Sloman & Fernbach, 2018). This is not a hypothesis to confirm or refute, but a research framework that takes seriously the constraints on individual cognition imposed by the social nature of human behavior (Hutchins, 2010). Second, the world is inordinately complex, yet the capacity of individual cognition is limited. As such, *individuals necessarily rely on cues to identify patterns* rather than basing each decision on exhaustive investigation and reasoning (Simon, 1956). Third, individual and collective belief formation is necessarily bidirectional: individuals learn information or reach conclusions and share them with their communities who in turn pass them on to other individuals via public knowledge representations (Boyd et al., 2011). Since people affiliate with voluntary, like-minded groups in large part because of their like minds (similar beliefs, values, etc.), this bidirectionality means that *group cues can be valid cues*. The fact that one's community holds certain descriptive or normative beliefs is often good reason for an individual to hold those descriptive beliefs or adopt those norms, since the reasons for these beliefs could be retrieved from other community members even if they are not presently available (see Mondak, 1993, for a convincing demonstration).

Taken together, these observations imply that trusting one's community can be an eminently reasonable shortcut. For difficult political judgments like policy appropriateness or candidate suitability, reliance on partisan cues indicating community beliefs may not reflect some cognitive deficit but rather an adaptive strategy,² especially if the information required for exhaustive reasoning is unavailable at the moment of judgment (for direct evidence, see Boudreau, 2009; Dahlberg & Harteveld, 2016; Pannico, 2017).

Of course, people belong to many different, partially overlapping groups, and disagreement between groups about normative claims is a normal feature of human society. But disagreements about the veracity of descriptive claims are of special concern. When two people do not agree that p , they will encounter serious difficulties deciding what to do about p , and disagreements of this descriptive nature have also been shown to divide along political fault lines (Frenda et al., 2013).

Personality and Cognitive Traits Predict Group Membership

Partisan groups disagree when their respective cues conflict, but why do people belong to these groups in the first place? Theorists have long noted that personality factors influence people's attitudes toward political issues and broader political ideologies. Previously, this research has largely focused on the direct

relationships between traits and ideological self-placement. Recently, however, psychologists have examined the psychological processes underlying ideological preferences (Hibbing et al., 2014; Johnston et al., 2017; Jost et al., 2017). After 85 years of theory and research on personality/cognitive style and political orientation has produced a long list of dispositions, traits, and behaviors. While the literature is diverse, the field is converging on two common ideas. First, *liberalism and conservatism are rooted in stable differences in threat sensitivity and tolerance for uncertainty*, from the initial processing and evaluation of stimuli (e.g. Oxley et al., 2008; but see Bakker et al., 2020) to the core values and moral inclinations that consistently guide behavior (e.g. Haidt, 2012). Second, scholars have identified *two opposing personality types or cognitive styles* consistently associated with these ideologies: an “open” type typically associated with political liberalism and a “closed” type associated with political conservatism (see Johnston et al., 2017). For example, studies administering both subjective and objective tests of cognitive style, as reviewed by Jost (2017), do reveal ideological asymmetries in information processing. These include cognitive and perceptual rigidity, intolerance of ambiguity, integrative complexity, and cognitive reflection, as well as need for cognition, the need for cognitive closure, self-deception, and preferences for intuitive versus analytical reasoning in general. Meta-analyses show that both patterns are stable and cross-cultural (Burke et al., 2013; Jost et al., 2017). Recently, Zmigrod et al. (2021), using an unprecedented number of cognitive tasks ($n = 37$) and personality surveys ($n = 22$), demonstrated that conservatism is associated with reduced strategic information processing (reflecting variables associated with working memory capacity, planning, cognitive flexibility, and other higher order strategies). Remarkably, recent studies using physiological measures also find that personality/cognitive traits and ideological beliefs covary (Dodd et al., 2012; Petersen et al., 2015; Soroka et al., 2019).

The fact that threat sensitivity predicts ideological positions shows that people affiliate with groups in part because of underlying traits. This is informative for understanding human behavior, but it is not particularly actionable. Although fear appeals sometimes work (Tannenbaum et al., 2017), clearly sometimes they do not, as there was no shortage of fear messaging during Covid-19 that evidently failed to convince many on the conservative end of the ideological spectrum (e.g. Gollwitzer et al., 2020). Other reliable predictors of group membership are uncertainty tolerance (Hogg & Adelman, 2013; Kruglanski et al., 2006) and openness to experience (Van Hiel et al., 2000), although it is an open question whether these dimensions are best understood as traits, cognitive style, or values (i.e. characteristics that follow from as opposed to generating ideological beliefs).

Individual Responsiveness to Information I: Is There a Crisis of Knowledge?

So much for leveraging personality or cognitive traits – how about simply providing the information that people lack? For decades, survey researchers have

measured voters' factual familiarity. The initial expectations of voter factual understanding were drawn from democratic theory: A democratic citizen is required to have *chronic* knowledge – to evaluate candidates' promised policy initiatives – and *topical* political knowledge, to appraise recent office holders' performance (Dahl, 1956; Key, 1966; Pitkin, 1967). This understanding of political knowledge – the things a person knows assessed to some reasonable standard of truth – can helpfully guide our understanding of political cognition. Descriptive beliefs which a person firmly accepts as true despite lacking any evidential support are sometimes called *misinformation*, and there is current evidence of *acute* misinformation acceptance regarding highly politically salient but ultimately descriptive (as opposed to normative) issues (Flynn et al., 2017). Common examples include the beliefs that the role of anthropogenic causes in global warming is the subject of scientific debate (Van der Linden et al., 2017), that vaccines endanger the health of the vaccinated (Dixon & Clarke, 2013), or that a shadowy group of elites controls geo-politics (Oliver & Wood, 2014). At the opposite extreme, we find topics on which the public is *uninformed*, such as the current partisan composition of a legislative body (Carpini & Keeter, 1993), the rate of economic growth or unemployment (Evans & Andersen, 2006), or an elected official's name (Mann & Wolfinger, 1980). Given that both phenomena concern information, a tempting thought is that recent cases of acute misinformation regarding matters on which scientific evidence can be brought to bear might be explained by a historically anomalous deficit of information about science itself. Are people unusually uninformed?

Being uninformed is dependent on human psychology and political incentives: people face competing demands for their time, and few intrinsic benefits to offset the costs of becoming deeply knowledgeable (Bartels, 1996; Lau & Redlawsk, 2001; Lupia, 1994). Evidence shows there's no growing trend in the incidence of being uninformed regarding basic political knowledge measured over decades (Baum, 2003; Galston, 2001). This is apparent in numerous developed countries (Grönlund & Milner, 2006). The trend is the same for basic scientific knowledge, as a simple description of Europeans' factual understanding over recent decades shows. Since the 1980s, the European Commission's Eurobarometer has intermittently administered a 12-item quiz on scientific understanding to a probability sample of EU adults. These items tap topics of science with which regular people should have some factual familiarity. For instance, the effectiveness of antibiotics in killing viruses as well as bacteria, or the working of lasers, have chronically eluded respondents. Other questions, touching on basic scientific topics like geology or photosynthesis, have proven easy over the entire time. This pattern is largely stable over multiple decades (see [Figure 7.1](#)).

In sum, there is no recent, sudden deficit of information. Plainly, the fundamentals of human psychology, which have shaped our engagement with the political world for as long as humans have lived in organized units (Axelrod & Hamilton, 1981), have not changed either. Rather, it is the information and political environment in which citizens live that has changed (Van Aelst et al., 2017),

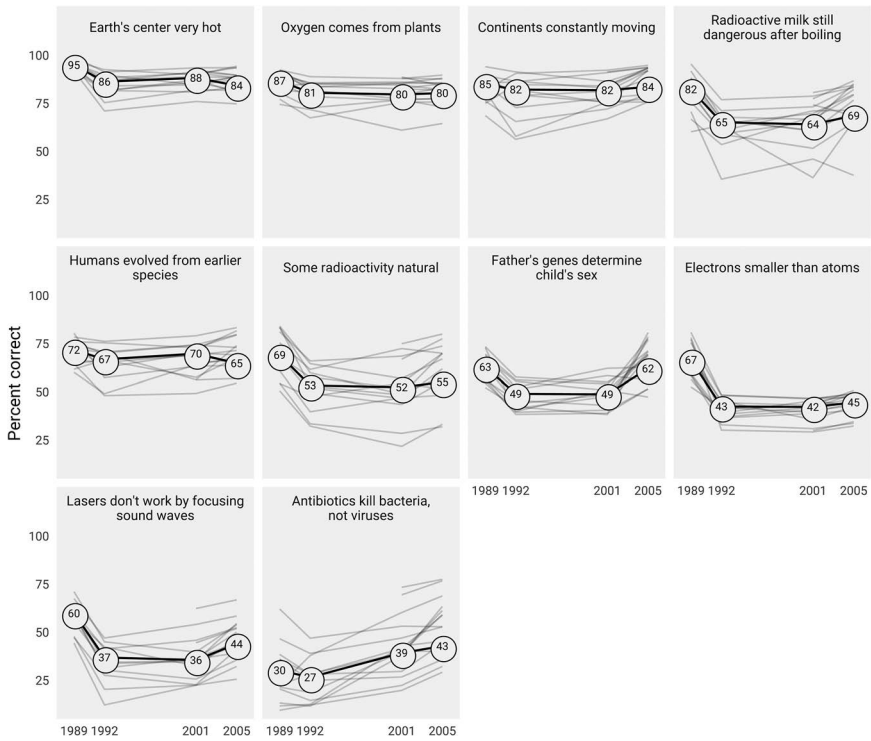


Figure 7.1 Scientific Understanding in Europe, 1989–2005.

Each facet shows the percentage of respondents providing the correct answer to a separate item. Light grey lines indicate the proportion correct inside a specific European state. Dark grey lines, and labeled points, indicate the overall mean by year, weighted by states' population. Source: Eurobarometers 63, 55.2, 38.1, 31.

so the psychological question becomes how this change interacts with human cognition (Marsh & Rajaram, 2019).

Individual Responsiveness to Information II: Heuristics, Biases, and Motivated Reasoning

We have argued that reliance on group cues can be a reasonable cognitive strategy, that individual differences partly determine ideological preferences, and that the apparently deepening divisions regarding certain descriptive matters are not caused by a recent decline in basic descriptive knowledge. Still, we do not wish to overstate the rationality of the individual thinker. An extensive literature in psychology implicates basic cognitive processes that are likely contributors to, though not root causes of, the rejection of claims with good evidence. In the jargon, a heuristic is a type of mental shortcut, while a bias is a systematic leaning towards certain judgment outcomes (Gilovich et al., 2002; Tversky & Kahneman, 1974).

Heuristics

Representativeness describes an individual estimating the likelihood of an outcome based on its similarity to past events of its kind or salient situation features while ignoring the base rate of such outcomes (Tversky & Kahneman, 1974). Representativeness is a plausible cause of base rate neglect in political decision-making. Describing an individual as possessing the characteristics of an illegal immigrant, criminal, or terrorist, for example, may strongly suggest membership in these categories despite their infrequency in the population.

Availability describes an individual judging the frequency of a phenomenon by the subjective ease of recalling instances of its occurrence (Kahneman, 2011). Given that the amount of news coverage an event receives is proportional to its novelty, this heuristic is likely to distort probability judgments of politically charged occurrences, and the effect may be strengthened by political actors exploiting the well-known relationship between mere repetition of a statement and increased belief in its veracity (Dechêne et al., 2010). For instance, there is no statistical relationship between immigration and violent crime (Bell et al., 2013), but repeat mentions of particular instances in which an illegal immigrant committed a violent crime may cause a listener to overestimate their prevalence. Preferential attention to negative stimuli (Fessler et al., 2014) may also make a rare but violent or frightening event more readily available to a person considering its likelihood, especially if she is highly threat sensitive.

Biases

It is commonplace to assert that political judgment involves motivated reasoning (Bolsen et al., 2014b; Flynn et al., 2017; Kraft et al., 2015; Leeper & Slothuus, 2014), a broad category of cognitive phenomena in which reasoning slants toward a favored conclusion (Kunda, 1990). Here the empirical record is strong. A meta-analysis of motivated reasoning studies (Ditto et al., 2019) found that the average effect size was moderate but almost identical across ideological groups (liberals, $r = 0.235$; conservatives, $r = 0.255$; see Figure 7.2). In a startling extension of bias blind spot – rating oneself as less biased than everyone else (Ehrlinger et al., 2005) – Ditto and colleagues also asked people to rate how biased they considered members of their own political party and members of the opposing party. Results were again symmetrical: each group thought the other was more biased than their own. In a similar finding, liberals ($d = 0.63$) and conservatives ($d = 0.58$) were equally averse to hearing the other side's views (Frimer et al., 2017).

Political polarization is also often overestimated by either side, in that people believe the divide between their own opinions and that of the supporter of an opposing political party or ideology to be bigger than it is. In an investigation across 26 countries, Ruggeri et al. (2021) found that so-called meta-perceptions – what we think others think – are often inaccurate. Experimental evidence from the same study also shows that inaccurate meta-perceptions can be corrected by

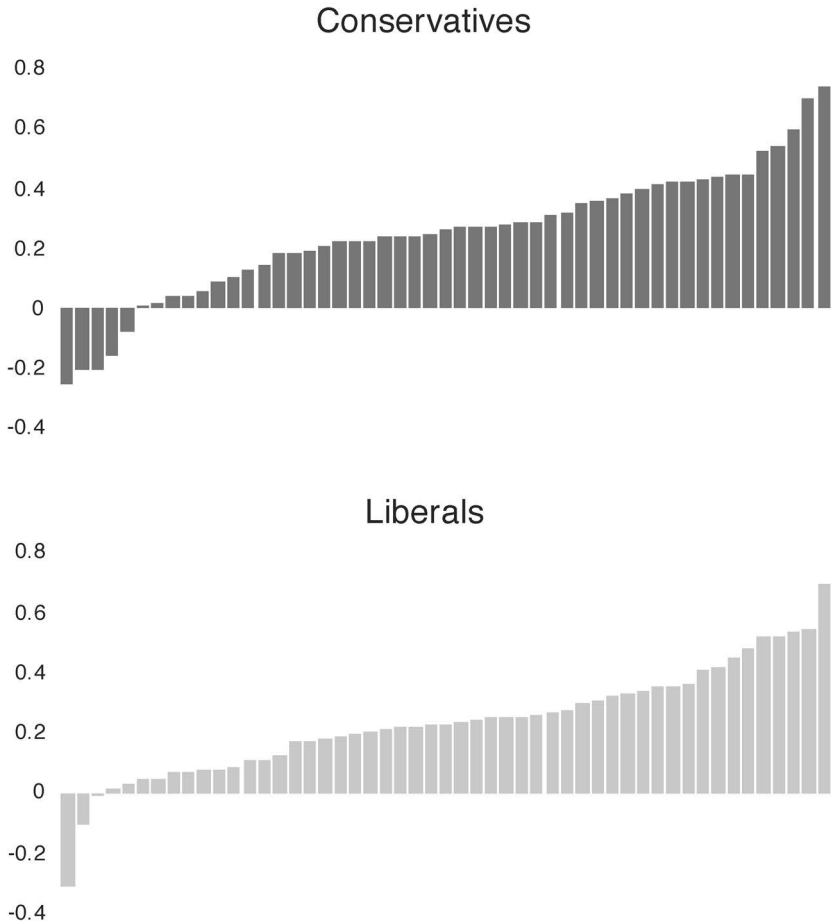


Figure 7.2 Range of Motivated Reasoning Effect Sizes by Political Ideology in Ditto et al.’s (2018) Meta-Analysis.

informing people of the actual opinions that supporters of the opposite political spectrum hold.

Confirmation bias or myside bias is a particular form of motivated reasoning defined as “the seeking or interpreting of evidence in ways that are partial to existing beliefs, expectations, or a hypothesis in hand” (Nickerson, 1998). The evidence that people do this is also substantial (see Mercier, 2017; Stanovich et al., 2013). Since citizens are prone to preferentially attend to and weigh evidence that supports desired belief outcomes, it follows that they may resist changing beliefs due to evidence that supports undesired outcomes.

Motivated reasoning is difficult to observe under controlled conditions because of a plausible alternative explanation: even paradigmatically rational belief updating (i.e. following Bayes’ rule³) requires that new evidence is

weighted in accordance with preexisting beliefs (priors). But Washburn and Skitka (2018) provide a convincing demonstration by measuring prior beliefs and manipulating the quality of the evidence. Participants received a fictional report about a politically relevant scientific finding accompanied by data shown in a 2 x 2 contingency table. The conclusions that the scientists drew in the fictional reports depended on either a correct or incorrect reading of the table. Respondents overlooked erroneous data interpretations when doing so yielded evidence that confirmed their prior beliefs, and this effect was seen across partisan groups. Kahan et al. (2017) report similar results in an earlier experiment (but see Persson et al., 2021), as do Scurich and Shniderman (2014), although these researchers did not manipulate whether the fictional scientists' inferences were warranted. Similarly, Ditto et al. (2018) found motivated reasoning effects specifically when respondents assessed empirical data or methods (as opposed to policy or candidate information). As with the full set of studies, liberals sometimes show larger effects than conservatives and vice versa. But the average effect sizes are again similar (liberals, $r = 0.292$; conservatives, $r = 0.228$), and neither group shows a disproportionately greater tendency to engage in motivated reasoning than the other.

Finally, we consider a different sort of bias. The Dunning–Kruger effect describes individuals with the lowest knowledge or ability in a domain displaying the largest overestimations of their knowledge or ability (Kruger & Dunning, 1999). This phenomenon has been demonstrated with basic political knowledge (Anson, 2018; Ortoleva & Snowberg, 2015) and is especially worrying for considerations of public policy, where nearly everyone lacks extensive knowledge (Lupia, 2016) and people often overestimate their own knowledge regardless of how severely they do so (Fernbach et al., 2013; Vitriol & Marsh, 2018). This bias may have real consequences for cases of acute misinformation, as a recent study found that a Dunning–Kruger effect for autism knowledge predicted opposition to mandatory vaccinations (Motta et al., 2018). In a related finding, self-assessments of knowledge are inversely correlated with actual knowledge and support for the scientific consensus on GMO foods (Fernbach et al., 2019).

Trust in Information Sources and the New Media Environment

Thus far we have discussed various determinants of responsiveness to evidence. But except in rare cases of direct observation – where your keys are, for instance – evidence comes from sources, and individuals have beliefs about the credibility of those sources. Such beliefs manifest as source effects, a topic of growing concern because of the changing information environment (Petty & Wegener, 1998; Pornpitakpan, 2004; Strömbäck et al., 2020). In stark contrast to previous eras of human civilization, individuals today face a surfeit rather than a deficit of information sources. This shifts the burden of identifying good information – a task once relegated to “gatekeepers” like governments or news organizations – to the layperson (Seifert, 2017). Moreover, the propagation of politically-relevant false claims through new information channels like social media is

widespread (Bradshaw & Howard, 2018) and has drawn international attention. We therefore expect the exercise of epistemic vigilance, already a feature of normal cognition (Sperber et al., 2010), to increase as the consequences of these changes sink in.

Dimensions of Source Trust

Theorists typically highlight two key dimensions of perceived source credibility, expertise and honesty (e.g. Harris et al., 2016). These dimensions are conceptually distinct – a scientist thought to be hiding conflicts of interest may seem expert but dishonest, a young politician may seem honest but inexperienced – but they are rarely directly compared in experimental studies. Interestingly, Lupia and McCubbins (1998) add a third dimension, commonality of interests. Arguably this captures cues indicating a source’s group, since co-membership in voluntary groups implies overlapping interests. Whether perceived commonality of interests is a precondition for perceived honesty (as in their model) or a separate factor is an open empirical question.

Available evidence suggests that people are sensitive to both expertise and honesty and distinguish them in their judgments. For instance, the continued influence effect has been shown to attenuate when a correction comes from an honest and expert source (Guillory & Geraci, 2013). Such attenuation was not observed, however, when expertise alone was manipulated. In addition, people may doubt the honesty but not the expertise of a scientist who is willing to discuss the ethical implications of his work (Hendriks et al., 2016). Other studies find that source expertise interacts with source honesty (Birnbaum & Stegner, 1979), argument strength (Bohner et al., 2002), and bandwagon cues, or indicators of widespread peer support for a claim (Go et al., 2014). The pattern of interaction in all cases is that higher expertise increases differences associated with the levels of these other factors⁴; in other words, people expect more from experts. The only study that we are aware of that arguably examines the commonality of interests (Swire et al., 2017) finds that attributing misinformation to Donald Trump (as opposed to no one in particular) increased belief in the claims for Republicans and decreased belief for Democrats. Since Trump is neither an expert on the issues used (vaccines) nor known for his unwavering honesty, commonality of interests could explain the result. Overall, this area is understudied given the collapse of the gatekeeper system discussed above, and the absence of political cognition research directly comparing these three dimensions of source credibility urgently merits redress.

Science Communication

In contrast, a rapidly growing body of research examines source credibility for scientific claims. As with so much else, partisan considerations loom large in the findings. A highly cited study found that trust in “the scientific community” markedly declined for US conservatives but not liberals or independents

between 1974 and 2010 (Gauchat, 2012). This apparent asymmetric trust in the scientific enterprise offers a simple explanation for why doubts about the scientific consensus on certain high-profile issues seem to cluster on the right, and partisan differences in trust in scientific experts on Covid-19 have been frequently observed (Hamilton & Safford, 2021; Kerr et al., 2021). But as Kahan (2015) emphasizes, asymmetric trust in scientific findings is not observed across issues; for instance, he finds no partisan divide over the safety of cell phones or artificial food colorings. This issue-selective pattern is also seen in source effects when the source is a scientist. Conservatives consider a scientist more credible when he presents evidence for conservative-consistent outcomes (e.g. that marijuana use is risky) as opposed to uncontroversial issues, while liberals consider him less credible (Vraga et al., 2018). And citizens' inferences about scientists' motives vary by political ideology: conservatives are more likely than liberals to infer that a (presumed liberal) scientist used his research to illustrate external causes of human behavior (e.g. education) rather than internal determinants (genetic disposition; Hannikainen, 2019). This selectivity is also seen in judgments of policy derived from scientific evidence; people consider policy "nudges" (behavioral interventions) more appropriate after reading about interventions that successfully guided behavior towards ideologically-consistent (versus inconsistent) outcomes (Tannenbaum et al., 2017).

Importantly, neither general distrust of the scientific enterprise nor selective trust in scientists' findings on particular issues can be chalked up to lack of information or poor education. A 40-country survey found the relationship between textbook scientific knowledge and positive attitudes about science to be quite small ($r = 0.08-0.14$; Allum et al., 2008), and educational attainment shows no relationship with trust in science regarding widely studied issues that exhibit partisan trust asymmetry, climate change (Ehret et al., 2017; McCright & Dunlap, 2011; Zia & Todd, 2010) and vaccinations (Kossowska et al., 2021). In fact, some data suggest that possessing more information leads to increased polarization rather than convergence regarding the descriptive claims of science: greater scientific and political knowledge predicts higher skepticism of anthropogenic climate change among conservatives and lower skepticism among liberals (Bolsen et al., 2014a; Hamilton, 2011; Kahan et al., 2012). This pattern is also issue-sensitive, as Drummond and Fischhoff (2017) found that educational attainment and science knowledge predicted partisan polarization on stem cell research, human evolution, and the Big Bang but not nanotechnology or genetically modified foods. However, Czarnek et al. (2021), analyzing the effects of education and political ideology across 64 countries, found that education has positive effects on pro-climate change beliefs at low and mid-levels of development. At higher levels of development, right-wing ideology attenuates (but does not reverse) the positive effects of education. These analyses extend previous findings by systematically investigating the between-country variation in the relationship between education, ideology, and climate change beliefs. Taken together, these findings further support the view that motivated reasoning partly accounts for group disagreements about descriptive scientific claims.

Wildcards

Having raised the specter of the new media environment, we note two findings that are highly relevant although they are not source effects per se. First, an extensive literature shows that claims are more likely to be considered true simply when repeated more often (see Dechêne et al., 2010, for a meta-analysis reporting medium effects). Plainly, this tendency can be exploited to a startling degree in the present information environment, where the options for repetition are nearly endless. This illusory truth effect has been observed in laboratory experiments using false headlines from the Internet (Pennycook et al., 2018), and increasing the number of repetitions does not appear to backfire (Ecker et al., 2019). In a related finding, Braasch et al. (2016) report that people became worse at identifying the source of a claim the more that equivalent claims were repeated by other sources.

Second, a growing body of research examines the bandwagon cues noted above. The number of “likes” a source receives can increase its perceived credibility (Borah & Xiao, 2018), negative comments can decrease credibility (Hughes et al., 2014), and the valence of user comments (Kim, 2015) or number of “likes” (Messing & Westwood, 2014) can overpower source credibility in news evaluations. Basing one’s judgments on the views of peers is not new behavior, nor is it inherently problematic since these views may index group beliefs, as we have argued. But the extent to which one can access those views in real time and the degree to which online measures may distort true group opinion are historically novel. Even though mere repetition is not necessarily a valid cue to the trustworthiness of a claim and bandwagon cues are not necessarily indicative of one’s group, we expect they will increasingly compete with source credibility.

Conclusions and Future Directions

Although people sometimes reflect on information in a balanced and objective way, they also engage in motivated cognition, i.e. reach a preferred conclusion first, and then appraise it in a directional way in order to confirm that conclusion. In this chapter, we tried to answer the question of why people would want to reject evidence and make their judgments based on biased or inaccurate information. Specifically, we focused on the role of partisan cues, misinformation, and source credibility as factors driving knowledge acceptance or rejection.

The evidence that judgments sort by political party or ideology is overwhelming. We interpret these findings in line with the common view in political science that using group cues as judgment-relevant information is a reasonable strategy since people generally lack the detailed knowledge of government and policy that would seem necessary for accurate predictions. This view is consonant with a perspective enjoying growing support in cognitive science, namely that individual cognition is best understood as serving and interacting with group behaviors. Partisan effects on judgment therefore reflect what is likely a general tendency in human cognition: to treat the beliefs of one’s community as useful

information when reasoning under uncertainty. The fact that individual differences – specifically, in threat sensitivity and aversion to uncertainty or novelty – partly predict which ideological communities people belong to garners a deeper understanding of political sympathies.

Measures of basic political and scientific knowledge show no sudden, recent decline, so the well-known cases of misinformation that have engendered a sense of crisis in the research community are not a consequence of historically anomalous levels of information deficit. They may of course be consequences of bad-faith actors spreading misinformation, but the question that political psychology can help answer is why these claims are accepted, not where they come from. We have seen that for certain highly politicized issues, higher levels of knowledge, education, and reasoning ability are associated with greater polarization rather than convergence on beliefs about descriptive matters. This pattern is strongly suggestive of motivated reasoning. Similarly, although conservatives and liberals outwardly express different levels of trust in science as an institution, this trust can influence judgments in an issue-selective manner. Motivated reasoning has been extensively documented, and the notion that it partly drives political judgment is hardly novel. But its symmetrical presentation across the ideological divide suggests that it too is a normal feature of cognition rather than a defect. The social role of cognition has been invoked to explain some forms of motivated reasoning as well.

We emphasize that these findings represent patterns, not inviolable rules. It is not the case that political judgments are *unfailingly* determined by these factors, so the question is how to cut through the fog of counter-evidential group cues, motivated reasoning, mere repetition, and so on. Some strategies show promise. For example, preliminary findings suggest that making information easier to understand (Shulman & Sweitzer, 2018; Van der Linden et al., 2014; Visschers et al., 2009) and promoting reflective thinking (Bessarabova et al., 2016; Swami et al., 2014) may be effective. Some studies have also shown that message inoculation (“pre-bunking”) reduces belief in subsequent mischaracterizations of scientific consensus (Cook et al., 2017; Van der Linden et al., 2017), and that encouraging people to reflect on the inaccuracy of information reduces the likelihood that they pass it on through social media (Pennycook et al., 2021). In addition, providing causal information has been shown to counteract lingering misinformation (Johnson & Seifert, 1994), although it is less clear why. Given that individual causal representations are usually sparse, not just in the political domain but for many complex systems, the answer likely requires a deeper understanding of the relationship between individual and collective representations.

A final factor that we have considered is source credibility, or the beliefs that an information consumer holds about an information provider. Unfortunately, the roles of perceived trustworthiness, expertise, and commonality of interests in political judgments are not well understood. More research in this area is urgently needed because source credibility takes on an outsized importance in the changing information environment. In this environment, claims travel quickly, and even photographic or video evidence is easily manipulated. Given

that people are generally bad at detecting such manipulations, information consumers will need to be increasingly discerning about source credibility. This problem becomes acute when information is highly time sensitive – for example, when people go to vote.

Notes

- 1 In this chapter, we used parts of a report written by the authors for the European Commission's Joint Research Centre ("Understanding our political nature" project). The copyright in that report is owned by the European Union. Reuse of the parts of the report reproduced in this book chapter is authorized under the Creative Commons Attribution 4.0 International (CC BY 4.0) licence. This means that reuse is allowed, provided appropriate credit is given and any changes are indicated. We thank Ralph Hertwig, Stephan Lewandowsky, David Mair, Hugo Mercier, Steven Sloman, and Laura Smillie for invaluable feedback on an earlier draft.
- 2 Political scientists have long studied and often defended political decision makers' reliance on partisan cues (e.g., Lau & Redlawsk, 2001; Lupia & McCubbins, 1998) but under the rubric of *heuristics*, a term with slightly different connotations in cognitive science.
- 3 Updating according to Bayes' rules happens when the prior belief is adjusted in light of the new information, taking into account the individual's confidence in the new information relative to her confidence in the prior 'best guess'. For example, imagine that someone takes money from a tip jar. If you have stronger (more certain) prior beliefs about this person's trustworthiness, you may decide that she has innocent intent (e.g., she was intending to make change for a dollar). By contrast, if you have weaker (less certain) prior beliefs about her trustworthiness, you might be less likely to see this behavior in a positive light.
- 4 We note with interest that an in-group manipulation eliminated this pattern of interaction in Go et al.'s (2014) data, suggesting that group cues can override other source effects.

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8 Reports of the Death of Expertise may be Exaggerated

Limits on Knowledge Resistance in Health and Medicine

*Henri C. Santos, Michelle N. Meyer
and Christopher F. Chabris*

Introduction¹

During the later years of his life, Mark Twain was asked by a journalist about rumors circulating that he was seriously ill and dying. “The report of my death was an exaggeration”, he famously replied. In the past decade, the idea that expertise is dead, or at best moribund, has become commonplace (e.g. Freedman, 2010; Kakutani, 2018; Nichols, 2017; O’Connor & Weatherall, 2019; Wikforss, 2017). It is true that experts are often overconfident in their own abilities: most professional stock pickers earn poorer returns than the market as a whole (Swedroe & Berkin, 2020), and most political scientists and pundits are only slightly better at forecasting future world events than at forecasting coin flips (Tetlock, 2005). But when taken too far, a healthy skepticism of expert ability to predict specific future events can metastasize into indiscriminate disdain for expert knowledge. During the Brexit referendum campaign, for example, UK cabinet minister Michael Gove (2016) dismissed economic analyses of the referendum’s consequences by saying “Britain has had enough of experts”. Five years later, it has become cliché for people to assert “I did my own research!” when they choose to disregard expert advice in favor of something they came across online. During the COVID-19 pandemic the Surgeon General of Florida, nominally an expert on public health, even said residents “need to continue and stick with their intuition and their sensibilities” regarding the safety of vaccines (Blake, 2021).

Some accounts of the “death of expertise” and the rise of knowledge resistance note that it is less costly to be irrational with respect to matters of fact (or myth) that do not affect people personally and directly. Disregarding evidence for climate change or the impact of immigration is an option for many people because they perceive that their own lives and livelihoods are not immediately at stake. Even entertaining the belief that the earth is flat (which a Google Books Ngram search suggests was at a 220-year peak in 2021) does not stop one from traveling safely to any location. The domain of medicine and health, however, is less abstract. Deciding whether to accept advice from physicians, researchers, and public authorities, can affect everyday health, as illustrated by cases of patients who deferred vaccination, flouted mitigation guidelines, or put their trust

in quack treatments, only to regret their decisions from their beds in hospital COVID wards (Healy, 2021).

However, public reactions to COVID-19 mitigation and vaccination efforts in the United States and other countries suggest that many do not always trust medical expertise. This is problematic insofar as trust in medical experts predicts following instructions that promote personal and public health. In 2020, the World Health Organization asserted that addressing the threat of COVID-19 would include managing an infodemic, in which there was too much information available, with accurate information mixed with both accidentally and deliberately disseminated false or misleading information (World Health Organization, 2020). While public health professionals and institutions should have expertise in responding to viral epidemics, positive ratings for these experts have been declining in the United States (Robert Wood Johnson Foundation, 2021).

Many scientists argue that this reaction is not limited to COVID-19, which is a novel and still-unfolding situation. Polls and studies – mostly in the US, but also including some global reports – report low trust in science on some key issues like climate change, GMOs, and vaccinations (e.g. Fagan & Huang, 2019; Funk et al., 2015; Funk et al., 2020b; Hornsey et al., 2018). For instance, there is a large gap between US adults and scientists with regards to the safety of genetically modified foods (51 percentage points), anthropogenic climate change (37 points), and human evolution (33 points; Funk et al., 2015).

In the US, many of the disagreements about these scientific issues have been attributed to ideological and political divides (e.g. Druckman & McGrath, 2019; Gauchat, 2012; Kahan et al., 2012, 2017; Lee, 2021; Rekker, 2021). Discussions of anti-intellectualism in the US have been going on as far back as the 1960s (Hofstadter, 1963), with evidence of decreasing trust in science – at least among political conservatives – since the 1970s (Gauchat, 2012). A survey of 14 countries shows that the political left (more than the political right) tends to trust that scientists are doing what is right for the public (Funk et al., 2015). When looking at specific topics like climate change, there is evidence of political divides outside the US, in countries like Australia (Leviston et al., 2011; Tranter, 2011) and the United Kingdom (Whitmarsh, 2011). However, this is not necessarily universal, as a study of newspapers in India found that 98% of the articles examined described climate change as anthropogenic, with several articles criticizing American climate change skeptics (Billett, 2010).

Aside from political affiliation, cross-cultural research on social media news use suggests that people in collectivist cultures with high power distance are more likely to trust science, since people in these cultures tend to value the opinions of others and follow authority figures (Huber et al., 2019). A 24-country investigation of antivaccination attitudes similarly finds that people who have less individualist and more communitarian values tend to have more positive attitudes toward vaccination, as they are more willing to allow society and the government to make decisions for them (e.g. by mandating public health measures; Hornsey et al., 2018). Other geographical factors that may be associated with trust in science include living in urban areas and being non-religious (Krause et al., 2019).

There are also topic-specific factors, such as fear of needles and disgust about blood, associated with antivaccine attitudes (Hornsey et al., 2018).

With regards to how this lack of trust emerges, a large body of research has investigated motivated reasoning, where people accept, reject, and modify new information based on their prior beliefs or those of their group (e.g. Druckman & McGrath, 2019; Kahan et al., 2012, 2017; Rekker, 2021). Findings from this work suggest that cognitive ability and scientific knowledge might ironically equip people to explain away new information that they do not agree with (Kahan et al., 2012). Research on misinformation and conspiratorial thinking suggests that a lack of careful and deliberative reasoning makes it more likely for people to uncritically accept and disseminate information that does not have a proper scientific foundation (Bago et al., 2020; Pennycook & Rand, 2021; Pennycook et al., 2015; Swami et al., 2014).

However, it might be unfair to paint the public's interactions with science and expertise with such a wide brush. Public opinion surveys in the US, Germany, and the UK have found overall confidence in science and scientists to be stable, if not increasing, over the past few years (American Academy of Arts and Sciences, 2018; Funk et al., 2019; Krause et al., 2019). In a survey of 20 countries, a majority of respondents said that they have at least some trust in scientists to do what is right (Funk et al., 2020b). In line with the stable trust of scientists, public understanding of scientific topics, probability, and experimentation has remained stable in the US over the past 20 years (Besley & Hill, 2020). Misinformation might also not have as strong of a grip as feared; a national survey of Democratic and Republican politicians found that regardless of their party's stances on genetically modified organisms, rent control, and drug policies, policy makers from both parties revised their beliefs in the direction of presented evidence (Lee, 2021).

While positive ratings of public health institutions have slightly declined, and trust in them was mixed during the COVID-19 pandemic (at one point, only 52% of those surveyed trusted the Centers for Disease Control and Prevention), around 70% of people still trusted doctors and nurses, reflecting much greater trust than in friends and family (40%; Robert Wood Johnson Foundation, 2021). This may reflect a more positive view of those who can remedy illness (e.g. frontline doctors) as opposed to those who prevent it (e.g. public health figures), especially if there isn't public consensus around the methods to mitigate the illness, and they include reducing individual liberty. This suggests that even if people might not trust all the experts available, there are apparently still some that most will listen to. It is not enough to group all scientists – or even those within a certain domain – together.

Similarly, not all publicly contested scientific findings are equal. Recent concerns about the rejection of expertise have largely focused on topics that involve public policy (Bauer, 2009; Hotez, 2020; Rutledge, 2020; Editorial Board, 2016). While political identification plays a role in how people listen to experts, researchers' perceptions about this problem might be driven by a vocal minority or a few contested topics. People and ideologies that reject experts might not be rejecting science or educated elites as a whole, but only certain claims or fields (Rekker, 2021). Research on the politicization of science has largely focused

on a few “controversial” scientific topics such as anthropogenic climate change, evolution, and vaccinations, while disregarding others like cognitive ability and behavioral genetics. Even when looking at a set of ostensibly divisive topics, researchers found little partisan disagreement in many of them (McPhetres et al., 2019). Although there might be hotspots where expertise is politicized and fiercely challenged, overall trust in expertise might still be alive and well. It should also be kept in mind that trust in science is in some ways blind. Research in cognitive science shows that acquiring and integrating scientific knowledge is not as rational and frictionless a process as we might assume. New facts and understandings coexist uneasily in the mind with ideas acquired earlier in life, with systematically biased perceptions of reality, and with anecdotes and myths, making it effortful and error-prone to follow science when its conclusions do not accord readily with our intuitions and common sense (e.g. Shtulman, 2017).

In light of these conflicting considerations, we conducted a series of three studies designed to assess the health of expertise in the domain of health. We attempted to measure whether and to what extent the general public would choose to access a broad variety of sources of expert medical advice. The domain of health and medicine is relevant to everyone, has clear indicia of expertise (e.g. medical degrees and specializations), established organizations that determine expert consensus (e.g. government institutions and professional societies), and high-profile information sources who are inside as well as outside the field (e.g. surgeon and talk-show host Dr. Mehmet Oz, actress and media entrepreneur Gwyneth Paltrow, and politicians). If phenomena such as the death of expertise (Nichols, 2017) and the rise of misinformation (Pennycook & Rand, 2021) apply to healthcare, then people should be willing to seek unreliable sources about medicine and prioritize them over reliable ones.

Rather than simply ask participants how much they trusted different sources, a fairly abstract and general (though common) question, we offered them the opportunity to read an article from one of a dozen sources giving advice on how to manage a medical condition that personally concerned them. We then showed them the article they had chosen (in fact everyone was shown the same article for any given source, as we did not want to spread non-expert or biased advice to our participants) and asked them to read it before continuing in the study. In this sense, our studies were more “incentive-compatible” than public opinion surveys, since there was a real (if small) consequence to participants for stating a preference for an information source. We also clustered ratings for different sources of expertise and evaluated their associations with individual differences in political identification, rational thinking, and intellectual humility, all of which might plausibly influence the degree to which people trust and attend to expert advice.

Assessing Preferences for Sources of Expertise

To assess people’s preferences for different sources of medical expertise, we conducted three studies in 2019 and 2020 among almost 2000 online survey respondents in the United States. Respondents were recruited via Amazon

Table 8.1 Demographic Characteristics of Participants in Studies 1–3

	<i>Study 1</i>	<i>Study 2</i>	<i>Study 3</i>
N	303	265	1431
Age (mean, SD)	36.3 (10.4)	35.2 (10.4)	39.8 (12.6)
Gender (% female)	40.6%	43.6%	49.5%
Ethnicity (%)			
American Indian or Alaskan Native	1.0	0.4	N/A
Asian	7.6	6.0	9.2
Black or African-American	8.9	9.8	8.7
Hispanic	3.6	5.3	6.9
White	77.6	76.2	78.4
Other	1.3	1.9	1.0
Education			
Less than high school	0.3	0.0	0.5
High school or equivalent	14.9	12.8	11.2
Some college	17.5	19.2	26.8
Vocational/associate degree	15.2	12.1	N/A
4-year degree	40.6	45.7	43.3
Graduate degree	11.6	10.2	18.0
Annual Income (median category)	\$40–50,000	\$50–60,000	\$30–40,000

Note: In Study 3, demographic questions were changed so that multiple ethnicities could be selected (for a total percentage greater than 100); vocational/associate degree and American Indian or Alaskan Native were also removed as response options for Study 3.

Mechanical Turk (MTurk). Although none of the samples were recruited or weighted to be precisely representative of the US population, each study included a fairly diverse sample of participants (see [Table 8.1](#)).

In Study 1 ($N = 303$; data collected on March 3, 2019), we asked respondents to select one of several possible sources of information to read about a disease or medical condition that concerned them, and we asked them to rank the remaining sources to see how they prioritized them. In Study 2 ($N = 265$; April 23–25, 2019), we tested whether people’s preferences differed depending on how concerning the medical condition was to them. Study 3 ($N = 1431$; September 14–15, 2020) recruited a much larger sample during the first resurgence of the COVID-19 pandemic in the US, and we took advantage of this unfortunate circumstance to examine whether people’s preferences for health information sources were different for a novel, politicized health threat than for a well-understood but also very serious condition.

In each study, respondents initially indicated whether they had a family history of eight common serious diseases and conditions: Alzheimer’s disease, cancer, chronic kidney disease, chronic lung disease, diabetes, heart disease, obesity, and stroke. They then ranked these conditions based on how personally concerned they were about them. In Study 1, respondents were next asked to think about the most concerning medical condition they selected. In Study 2, respondents were randomly assigned to think of either their most or least concerning medical condition from that list. In Study 3, we randomly assigned respondents to think

about either cancer – which had ranked as the most concerning medical condition in both Studies 1 and 2 – or COVID-19.

Respondents in each study were next given the opportunity to read an article with tips on how to reduce the risk of getting the medical condition they selected (Study 1) or to which they were assigned (Studies 2–3). They were then given a choice of 12 sources (Studies 1–2) or 14 sources (Study 3) of information for this article, with the implication that each source was actually the author or creator of the article they would get to see. We selected a variety of sources that varied in the type of source: individual figure, institution, or representative survey of individuals. Individual sources also had varying characteristics (e.g. physician, scientist, journalist, layperson, celebrity). We gave fictional names for the physicians, the journalist, the scientist, and the pharmaceutical company, and used real names for the celebrities, politicians, government institute, and medical professional societies. Table 8.2 shows the specific sources offered in the three studies, as they were described to participants.

We did not follow a systematic design when devising these sources of information; rather, our selection was motivated by the following questions: Are medical sources prioritized over non-medical sources? Are specialists in a sub-domain prioritized over generalists? Do the consensus or polled opinions of large groups of people rank higher than other sources of information (as research on collective intelligence suggests they should be; e.g. Surowiecki, 2004; Wolf et al., 2015)? Are celebrity sources – expert or non-expert – prioritized over non-celebrity sources? Are individuals or groups prioritized as a source of information? Note that we did not design the studies to have statistical power for directly testing each of these questions; our goal was to describe overall patterns.

After selecting a source to read, respondents in Study 1 were asked to rank the remaining sources. In Studies 2 and 3, we also asked respondents to rate all sources on 1–5 Likert-type scales for (1) how helpful they were as a source of medical information, (2) how much they trusted that source as a source of information about their assigned medical condition, and (3) how curious they were to read the article from that source. Ratings in response to these three items correlated highly and therefore the items formed a scale with high reliability (Cronbach's alphas: 0.71–0.87); for analysis, we collapsed them into a single score rating the “quality” of the source.

After rating or ranking the sources, respondents were shown the article. The article was ostensibly written by their chosen source, but for each medical condition, it was a standardized article that we wrote using readily available recommendations from medical professional societies and government health institutes regarding that condition. Respondents then answered some questions about the article and their familiarity with the celebrity sources mentioned. In Studies 2 and 3, respondents also filled out the Rational-Experiential Inventory 10 (REI-10; Norris et al., 1998), a measure of the habitual tendency to use rational/analytical or experiential/intuitive thinking styles (Pacini & Epstein, 1999), and the General Intellectual Humility Scale (GIHS; Leary et al., 2017). We included these scales to assess individual differences in reasoning styles and intellectual

Table 8.2 List of Sources of Expertise Used in Studies 1–3

<i>Source of expertise</i>	<i>Description provided to respondents</i>
Physician in a relevant domain (e.g. cardiologist if randomized to heart disease)	information from Dr. Brian Davis, a doctor specializing in [medical condition]
Physician in an irrelevant domain (e.g. dermatologist if randomized to heart disease)	information from Dr. Ryan Wilson, a doctor specializing in skin disease
Journalist in a relevant domain	information from Stephen Green, a journalist who primarily writes about [medical condition]
Scientist in a relevant domain	information from Alex Miller, a research scientist who primarily studies [medical condition]
Survey of the general public	information based on a representative survey of 1,000 members of the general public
Survey of doctors	information based on a representative survey of 1,000 doctors
Survey of patients	information based on a representative survey of 1,000 people with [medical condition]
Government Health Institute	information from the National Institutes of Health, a government medical research center
Drug company that makes products for the target medical condition	information from LBY Medical Innovations, a company that develops products for people with [medical condition]
Medical professional society for those specializing in the target medical condition (e.g. the American College of Cardiology for heart disease)	information from [professional society], a society of health professionals specializing in [medical condition]
Celebrity physician (Dr. Mehmet Oz of the television program “The Dr. Oz Show”)	information from Dr. Mehmet Oz, host of the Dr. Oz Show on TV
Celebrity non-physician (Gwyneth Paltrow of the lifestyle company Goop)	information from Gwyneth Paltrow, actress and owner of the lifestyle company Goop
Study 3 only: Republican Politician	information from Republican Senator Mike Braun, a member of the Committee on Health, Education, Labor, and Pensions
Study 3 only: Democratic Politician	information from Democratic Senator Doug Jones, a member of the Committee on Health, Education, Labor, and Pensions

Note: Within each study, every participant saw the sources listed in a randomized order.

humility, both of which might be associated with less biased choices in sources (Leary et al., 2017; Pennycook & Rand, 2021).²

General Preferences for Sources of Medical Expertise

As seen in [Figure 8.1](#), in all three studies, participants most commonly chose to read advice from the medical professional society relevant to their condition. While the specific rank-order of the next six sources varied from study to study,

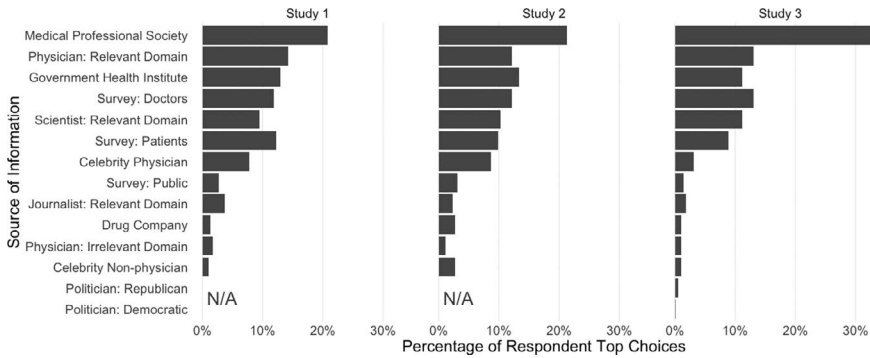


Figure 8.1 Overall Preferences for Source of Medical Information.

Note: The figure shows the percentage of study participants choosing to read an article about their assigned medical condition from each of 12 (Studies 1–) or 14 (Study 3) sources offered.

the top seven preferences all had legitimate expertise or personal experience with the medical condition. The top six preferences were chosen by 81.5, 79.1%, and 89.9% of the respondents in Studies 1–3, respectively.

While the celebrity physician (Dr. Mehmet Oz) was ranked 7th in all three studies, fewer people chose him as a first choice in Study 3. It is worth noting that Dr. Oz’s daily television show has been reported to give medical advice that is supported only one-third of the time by “somewhat believable” or “believable” evidence (Korownyk et al., 2014). However, Dr. Oz is a cardiothoracic surgeon by training and could be considered an expert in that domain. With that in mind, we looked at the rankings excluding people who were selecting a source to read about heart disease or chronic lung disease, and found a similar pattern.

The non-expert celebrity, actress and entrepreneur Gwyneth Paltrow, is a popular source for lifestyle, beauty, and health advice whose programs can be found on Netflix and whose magazines are sold in supermarkets across the US. Given her popularity and her reputation for dispensing pseudoscientific or even dangerous advice (Caulfield, 2015), we were both surprised and relieved to find that she ranked last or third-to-last in all three studies.

Overall, our findings suggest that the majority of respondents look to medical professionals or to patients with first-hand experience of their concerning medical condition, with most people choosing a society of medical professionals. The society of medical professionals is arguably the best choice offered, as a recommendation from them represents a consensus of experts as opposed to a potentially idiosyncratic individual physician, or a group of physicians or patients who are not credentialed specialists in their medical condition. Although a journalist in a relevant domain should also be a credible source, respondents preferred medical professionals. Likewise, a company that makes products addressing a medical condition should have access to much expertise on that condition, but respondents consistently ranked pharmaceutical companies near the bottom, perhaps assuming they are biased by commercial interests.

In Studies 2 and 3, we experimentally manipulated whether the medical condition was of the highest or lowest concern to the respondent (Study 2) and whether it was cancer or COVID-19 (Study 3). We thought that respondents might be more motivated to discern between good and bad sources in conditions of high concern, or more likely to select politicized sources for COVID-19, which we also assumed was of higher concern than cancer to our average participant in late 2020. However, these manipulations had relatively small effects on participant preferences. As shown in Figure 8.2, the high-concern and low-concern conditions both had the same top seven information sources, although the most popular among people in the low-concern group was a medical professional society, while the most popular among the high-concern group was a representative sample of doctors. (We note that the pattern observed with the high-concern group in Study 2 did not completely replicate the pattern from Study 1, in which all respondents were asked to think about the medical condition they had ranked as most concerning to them: for the high-concern group in Study 2, preferences among the top seven sources spread out more evenly.)

In Study 3, we found that a medical professional society was the top source both for respondents assigned to think about cancer and those assigned to think about COVID-19. Perhaps reflecting the fact that COVID-19 was a novel medical condition with less time for experts to achieve consensus, we found that source preferences spread out more evenly with COVID-19 than cancer.

Looking beyond top preferences, we examined the mean rankings that respondents gave all the sources in Study 1 (see Figure 8.3). Here, we found a similar pattern for the top six sources, with domain-specific experts and groups of medical experts or patients who have experienced the medical condition being ranked, on average, higher than the rest of the sources. However, among the top six sources, there was little difference in mean rankings. Note that while there was a substantial preference for the medical professional societies when people were asked to choose just one source, this effect was much smaller with rankings.

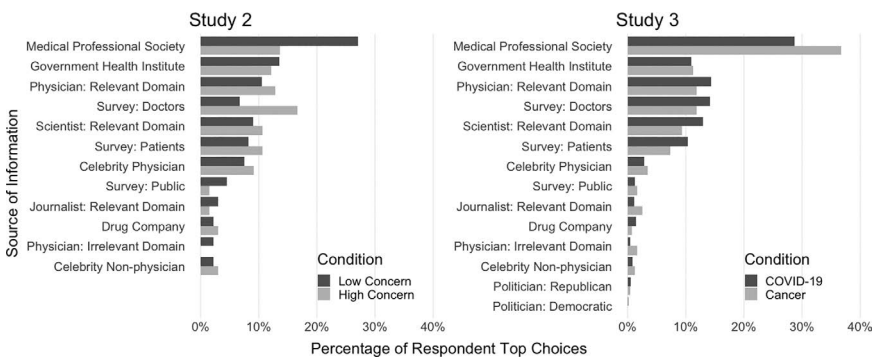


Figure 8.2 Preferences for Source of Medical Information by Experimental Condition.

Note: The figure shows the percentage of study participants choosing to read an article about their assigned medical condition from each of 12 (Study 2) or 14 (Study 3) sources offered.

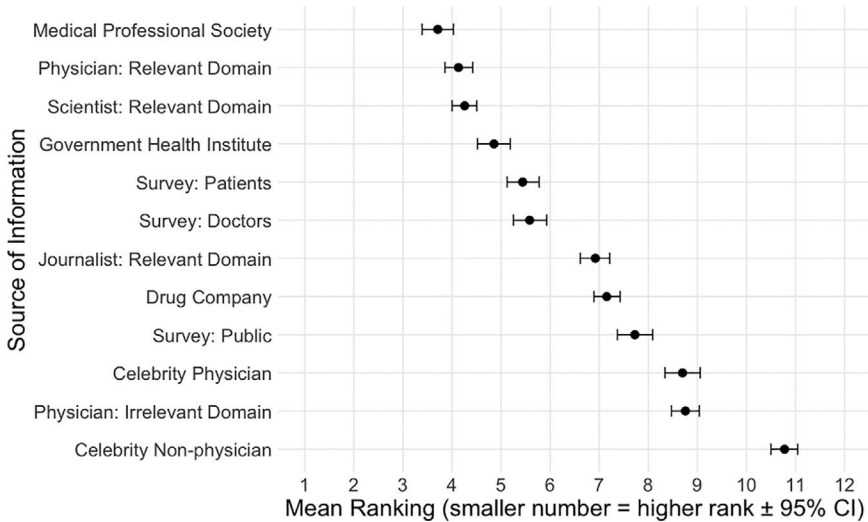


Figure 8.3 Mean Ranking of Sources of Medical Information in Study 1.

Clustering Sources of Expertise

To systematically categorize the different sources in Studies 2 and 3 and to reduce the ratings for 12 or 14 sources into a more manageable number of dimensions, we conducted exploratory factor analyses. In factor analyses, the assumption is that there is a set of underlying, unobserved variables – or factors – that can explain the relationships among the measured variables. For instance, if we find that a set of sources are all rated in a similar way, this suggests that there is a theme uniting those sources and they are perceived and understood as having something in common. As we did not have defined groupings of the sources a priori, factor analysis is a data-driven way of seeing what sources cluster together based on the ratings respondents gave them.

For both studies, we used principal components analysis with oblique rotation (which allows the inferred factors to be somewhat correlated with one another, rather than completely independent), and we found three factors (with Eigenvalues greater than 1, the standard cutoff). After examining which sources loaded onto the different factors (see Table 8.3), we found similar factor groupings in Studies 2 and 3, and designated the factors “Expert sources”, “Survey sources”, and “Less reliable sources”.

In Study 2, one factor (explaining 28% of the variance in the model) consisted of domain-specific expert sources: the physician in a relevant domain, the scientist in a relevant domain, and the medical professional society. Another factor (19% of variance) consisted of the surveys of physicians, public, and patients with the target medical condition. The remaining factor (21% of variance) consisted of less reliable sources: the drug company, the celebrity physician, and the celebrity non-physician. The government institution cross-loaded onto the expert and survey factors,

Table 8.3 Factor Loadings for Ratings of Sources in Studies 2 and 3

	<i>Study 2</i>			<i>Study 3</i>		
	<i>Expert sources</i>	<i>Survey sources</i>	<i>Less reliable sources</i>	<i>Expert sources</i>	<i>Survey sources</i>	<i>Less reliable sources</i>
Medical Professional Society	0.82	0.14	-0.18	0.86	-0.03	-0.06
Physician: Relevant Domain	0.87	-0.05	0.05	0.85	0.07	-0.70
Scientist: Relevant Domain	0.86	0.05	-0.01	0.83	0.08	-0.02
Government Institution	0.57	0.41	-0.09	0.77	-0.12	0.18
Survey: Physicians	0.20	0.82	-0.05	0.33	0.60	-0.02
Survey: Patients	0.12	0.77	-0.04	0.02	0.91	-0.07
Survey: Public	-0.28	0.72	0.35	-0.18	0.65	0.36
Journalist	0.61	-0.03	0.50	0.43	0.16	0.40
Drug Company	0.45	-0.02	0.66	0.31	0.27	0.44
Physician: Irrelevant Domain	0.01	0.36	0.54	0.24	-0.05	0.62
Celebrity: Physician	-0.03	-0.02	0.83	-0.01	0.01	0.71
Celebrity: Non-physician	-0.21	0.16	0.77	-0.11	-0.02	0.87
Politician: Republican				-0.06	0.04	0.86
Politician: Democratic				0.08	0.02	0.80

Note: Boldface indicates loadings ≥ 0.60 , a threshold we used as an indication that a source strongly loaded on the factor.

which suggests that an underlying theme in both explains the variation in the ratings for the government institution. Similarly, the doctor in an irrelevant domain cross-loaded onto the survey and less-reliable sources factors.

In Study 3, the expert sources factor (24% of variance) consisted of the physician in a relevant domain, the scientist in a relevant domain, the medical professional society, and the government institution. The survey factor (14% of variance) consisted of the physician, public, and patient surveys. And the less reliable sources factor (27% of variance) consisted of the celebrity physician, the celebrity non-physician, the Republican senator, the Democratic senator, and the doctor in an irrelevant domain. Here, the journalist and the drug company cross-loaded on all three factors. Ratings for the sources in Studies 2 and 3 coalesced into three fairly distinct clusters. While there were some differences among weakly loading sources, the composition of the clusters was mostly consistent between the studies. The sources consistently in the expert sources factor were the professional medical society, doctors specializing in the target medical condition, and scientists studying the target medical conditions – all of whom are domain-specific experts. The three survey sources were also grouped together. The sources that were consistently in the less reliable sources cluster were the celebrity physician and non-physician; depending on the study, the drug company, physician in a different specialty, and the Republican and Democratic senators were also part of this group. While there was not a strong theme uniting all of these sources, we labeled them as the “less reliable” sources as they generally do not possess clear domain-specific expertise and would be judged by professional standards as unreliable.

Table 8.4 Correlation between Factor Scores and Preference for Rational Over Experiential Thinking, Intellectual Humility, and Political Views in Studies 2 and 3

	Study 2			Study 3		
	Expert sources	Survey sources	Less reliable sources	Expert sources	Survey sources	Less reliable sources
Rational-Experiential Inventory (Rational)	0.02	0.04	-0.18*	0.07*	-0.11***	-0.10***
Intellectual Humility	0.38***	0.12	-0.07	0.35***	0.11***	0.02
Political ideology (Conservative)	-0.11	-0.10	0.04	-0.23***	0.07**	0.12***
Political Party (Republican)	N/A	N/A	N/A	-0.16***	0.02	0.01

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Correlates of Trust in Different Sources of Expertise

To examine individual differences in rating these sources, we also looked at the correlations between mean ratings of experts grouped by the three factors, politics, the habitual use of rational/analytical thinking or experiential/intuitive thinking as measured by the REI-10 (Norris et al., 1998; Pacini & Epstein, 1999), and intellectual humility as measured by the GIHS (Leary et al., 2017). We expected that respondents high in rational/analytical thinking and intellectual humility would be more likely to rate expert sources high and less-reliable sources low. Given that misinformation about COVID-19 and resistance against health measures like masking and vaccines have often come from the political right (Kempthorne & Terrizzi, 2021), we expected to find lower ratings of expert sources and higher ratings of less-reliable sources among political conservatives and Republicans. In Studies 2 and 3, we included a single 5-point measure of political ideology from liberal (1) to conservative (5). In Study 3, we added a measure of party affiliation, ranging from strongly Democratic (1) to strongly Republican (7).

As shown in Table 8.4, expert sources were given high ratings by those with higher intellectual humility while less-reliable sources were given low ratings by those who scored higher on the REI-10, which indicated a habitual preference for rational/analytical thinking over experiential/intuitive thinking. In study 3, we also found that rational/analytical thinking, being politically liberal, and affiliating with the Democratic party were positively associated with higher ratings for expert sources. Greater self-identification as conservative (but not necessarily Republican) correlated with higher ratings of less-reliable sources in Study 3. Notably, we also found a similar pattern when focusing only on COVID-19. Higher scores for the survey sources were positively associated with less rational/analytical thinking, greater intellectual humility, and a more conservative (but not necessarily Republican) political identification.

The results from the overall ranking of sources and ratings of factors suggest that people prefer to consult domain-specific expert sources for medical

information. The clear preference for medical professional societies across all three studies suggests that people prioritized a consensus of experts – or at least that the organizations mentioned are easily trusted and accessible sources. These findings support recent polls showing that scientists are among the most trusted leadership groups (American Academy of Arts and Sciences, 2018). These polls also provide some explanation for the relatively lower rankings of journalists and the pharmaceutical company despite their domain-specific expertise; only around half of those polled are confident that these groups will act in the best interests of the public (Funk et al., 2019).

In Study 3, we furthermore found evidence that those who identify as politically liberal and Democratic give higher quality ratings to expert sources and lower ratings to less reliable sources. These findings support polls and studies which have found that trust in scientists is lower for political conservatives (Funk et al., 2019, but also see McPhetres et al., 2019). The correlations with political ideology were not as strong in Study 2, which was conducted before the COVID-19 pandemic, suggesting that polarization of trust in experts might have increased in the US (Funk et al., 2020a).

The strongest correlate of giving high ratings to expert sources and survey sources (in Study 3) is the trait of intellectual humility, which is the tendency to recognize that one's personal beliefs or knowledge might be limited (Leary et al., 2017). More than simply being open to recommendations of experts, people with high intellectual humility are more open to and less threatened by alternative information, which could reduce the likelihood of confirmation bias (Porter & Schumann, 2018). They are also more sensitive to the persuasive strength of arguments and as a result might also be more discerning about the sources of information they trust (Leary et al., 2017).

While humility encourages people to value expert sources, rational/analytical thinking as measured by the REI-10 was associated with devaluing the less-reliable sources. This aligns with findings showing that people who reason analytically are more skeptical of paranormal and conspiratorial claims (Pennycook et al., 2015; Swami et al., 2014), more likely to distinguish between false and true news headlines (Bago et al., 2020), and less susceptible to biases (Lu, 2015; Toplak et al., 2011). People who report a greater preference for rational/analytical thinking might take more time to pick the best source and be less swayed by confirmation bias, familiarity, and other peripheral cues of the quality of the source. While certainly not conclusive (see Pennycook & Rand, 2021; Pornpitakpan, 2004), our findings suggest that a combination of political identity and cognitive factors may play a role in source selection. Nonetheless, these effects of individual differences merely modulate strong general preferences among all participants for high-quality sources of medical information about health conditions of concern.

Limitations of This Investigation

In light of the broader discussion about the death of expertise, it is important to note that our investigation focused on medical expertise, which is generally respected and trusted in the US. When asking respondents to choose and rate

their sources, we furthermore did not present hotly contested and politicized topics like vaccinations and masking, and did not name sources that were at the forefront of media coverage related to COVID-19 like Dr. Anthony Fauci and the Centers for Disease Control. While our investigation might be generalizable, as we found similar effects before and during the COVID-19 pandemic, it is thus unclear if this pattern would hold if a similar study directly mentioned controversial aspects of the response to COVID-19 or other politicized medical topics. Further, as the COVID-19 pandemic is a protracted and still-unfolding situation, the US public's trust in experts on this topic may continue to change.

Despite our efforts to present a plausible interaction with experts in our study, there are also key differences between our online survey and real-world situations in which people would receive information from experts. While we did offer the respondents names of the sources and eventually showed them an ostensibly real article, respondents knew that they were in a research study and could have treated the scenario as hypothetical or suspected that we expected them to respond "rationally". In addition, in reality, most people are not offered multiple sources of information juxtaposed next to each other, as though they were in an intellectual supermarket with medical society reports sharing shelf space with news articles, pharmaceutical ads, and celebrity TV shows. In a social media feed or news on TV, there is often only one messenger or attributed source of information available at any one time – if any real source is provided at all.

Furthermore, there was little context given to the sources we offered. Only the name and a brief description were provided, such as "Dr. Brian Davis, a doctor specializing in heart disease". Arguably, respondents were making selections based on the prototypical role or title rather than distinctive details about each source. They were not given the opportunity to review credentials or the quality of their arguments. As a result, our investigation was able to capture a surface-level interaction with fairly abstract expert sources. However, this lack of depth might not be very different from how people select sources to attend from the deluge of data in their daily lives. For instance, our investigation can still provide insights on how people could be influenced by social media posts, emails from work, or news stories depending on who the messenger was. Nevertheless, as with all experiments, these limitations should be kept in mind.

Conclusions

In the comedy film *Monty Python and the Holy Grail*, which still has much to teach viewers about logical reasoning and critical thinking, an early scene opens on a wooden cart piled with bodies being pushed through a muddy road during a medieval plague. "Bring out yer dead" yells the cart driver. A villager drags out a man's body and puts it on the cart, paying the driver's fee to take it away. But the man is still alive. "I'm not dead!" he protests. After a lengthy discussion, the cart driver realizes he can get around the regulations on hauling off live bodies by clubbing the man to death, which he does. The results of our three studies, in which US participants generally selected sources of information in a surprisingly rational pattern consistent with respect for expert authority, suggest that expertise is not yet

dead – at least when it comes to medical conditions that people are concerned about – but that it might yet be murdered by people who would profit from doing so.

At a minimum, our finding puts a boundary around the “death of expertise” concept, and shows that to the extent it applies, it does not apply equally to all domains or issues. While we did not study any areas other than medicine, we suspect that if we conducted similar studies on whether people preferred trained pilots for their flights, credentialed structural engineers for their bridges, or nuclear physicists for their power plants, they would almost uniformly agree that expertise is alive and well.

However, the general respect people showed for medical experts in our studies also reveals a weak point that agents seeking to manipulate public opinion, even in the health domain, could exploit. Passing along pseudoscience or fake news under the name of an alleged authority, made-up institution, or hastily convened group of experts (such as the “Front Line COVID-19 Critical Care Alliance” that promoted the drug ivermectin as a treatment for coronavirus infection; Huang, 2021) is likely to trick at least some people who think they are being careful in their information consumption habits. For instance, trust in science can ironically encourage belief in and dissemination of pseudoscientific information when it is accompanied by attractive graphics, references, and other trappings of quality scientific research. Appealing to the value of science does not attenuate this effect, but encouraging critical evaluation does (O’Brien et al., 2021). Respected sources of expertise can be used as vectors for misinformation; our results show why this can be expected to continue to work, at least until the practice degrades trust in true experts so much that it no longer works. Thus, ironically, the death of true expertise could also kill our willingness to fall for fake expertise.

Our results do point to intellectual humility as a potential antidote to the derogation of expertise. People need to find trusted sources, and they also need to maintain trust when experts make mistakes or change their course (Leary et al., 2017). In politics, changing one’s mind is (unfortunately) most often regarded as a sign of weakness, inauthenticity, or flip-flopping; increasingly those norms are being applied to experts outside of politics. With increasing access to science and particularly in the wake of COVID-19 people have become more exposed to the messy, multifaceted, and changing nature of scientific evidence and the recommendations and policies that are informed by it. While the search for accuracy is laudable, people do not have the time to become knowledgeable enough on every important topic (Kahan, 2017). Thus, intellectual humility – and related qualities like openness, wisdom, and a preference for rational thinking (Pinker, 2021) – might help people make judicious decisions in the face of changing expert advice.

Notes

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- 2 More detailed protocols for these three studies, along with complete materials, survey text, raw data, and R code for analysis, are available at the Open Science Framework (<https://osf.io/jmcp7/>).

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9 Is Resistance Futile? Citizen Knowledge, Motivated Reasoning, and Fact-Checking

*Paula Szewach, Jason Reifler
and Henrik Oscarsson*

Introduction

Citizens are confronted with an ever-growing volume of information to contend with. Not only is the sheer quantity of information growing, so too are the sources that people can choose for consuming information. This growth presents both peril and promise for people's ability to gather and hold the information that they need to be competent and effective members of a democratic society. A broad concern is that with so many choices, people can effectively resist knowledge, raising a series of important questions: Will citizens choose correct information over incorrect information? Will these high media choice environments allow people to become more easily misinformed? Once misinformed, can inaccurate beliefs be updated? In this chapter, we shed light on these questions by looking at two separate but related strands of literature that seek to understand people's baseline levels of information about politics, elucidate motivational biases in (political) reasoning, and estimate the extent to which people incorporate new information (especially when counterintuitive).

The answers to the questions posed above – e.g. will citizens choose correct information? – can have severe consequences if they result in large proportions of citizens holding false beliefs. For instance, the World Health Organization (WHO) recently included vaccine hesitancy, a belief system that frequently includes inaccurate beliefs about side effects, as one of the top threats to global health¹. Vaccine misperceptions are associated with non-compliance with recommended vaccinations (Opel et al., 2013). That such beliefs exist and easily flourish was (and remains) particularly worrying in the context of vaccination campaigns across the globe to stop the spread of COVID-19. Governments are now facing the challenge of maximizing the uptake of the vaccine, while combating the possible spread of misinformation sowing doubts about vaccine effectiveness and safety. Given the overwhelming evidence of the safety and efficacy of vaccines as a way to limit the spread of communicable diseases, vaccine hesitancy is a particularly potent form of knowledge resistance.

As Mnookin (2011) convincingly details, anti-vaccine sentiment is a long-standing problem that, unfortunately, gets high-profile boosters from time to time, such as the fraudulent (and since retracted) 1998 paper in the *Lancet*

concerning the Measles, Mumps, and Rubella (MMR) vaccine. Unfortunately, resistance to scientific knowledge is not limited to vaccines and vaccination. In 1999, South African President Thabo Mbeki and his health minister, Tshabalala-Msimang carried out policies that went against the best available evidence on AIDS treatment at the point of questioning that the disease even existed. As with vaccines, the consequences of this resistance are very real. AIDS denialism by the government of South Africa resulted in thousands of premature deaths (Nattrass, 2007).

Severe consequences of knowledge resistance are not limited to the health domain. A particularly acute example of the danger posed by knowledge resistance can be seen by then US President Trump's attempt to overturn his electoral loss to Joe Biden. While it is impossible to know what the former President truly believes, his rhetoric following the election sent an unambiguously clear (though factually incorrect) message – that Joe Biden only won the election through voter fraud. After weeks of inciting his supporters through these inaccurate and unsubstantiated claims of voter fraud, on January 6, 2021, the US witnessed an attack on its democratic institutions unprecedented in modern times. While the immediate goals of the January 6, 2021 Capitol insurrection were ultimately unsuccessful, new legislation restricting voting access is likely to be in place in many states before the next Congressional election. Some states have continued to push the unfounded voter fraud narrative through sham “audits” in key states. Taken together, these events serve as potent reminders of the fragility of democratic institutions, and the importance of effectively countering demagogic false claims.

In this chapter, we explore political science literature that is in some way connected to the broad theme of knowledge resistance. Along these lines, we identify several strands of literature within political science that are particularly helpful in relevant or helpful in thinking about knowledge resistance. First, we briefly review literature that characterizes how well informed the public is when it comes to politics. This strand of research is especially helpful in clarifying a central point when it comes to knowledge resistance – there is a crucial distinction between being uninformed and misinformed. From there, we explore how directionally motivated reasoning and its close cousin selective exposure contributes to knowledge resistance. We then look at literature that explores the causal effect of giving respondents corrective information. While initial research suggested that fact-checking practices might even be counter-productive in their attempt to correct erroneous beliefs, more recent work is more positive about the ability of corrections or “fact-checking” to improve the accuracy of people's factual beliefs. Nonetheless, there is still limited evidence that increasing the accuracy of factual beliefs transcends those specific beliefs to affect preferences or behavior.

Understanding how citizens make political decisions is one of the most long-standing endeavors that political scientists have faced. In that sense, the relationship between information processing, knowledge, and behavior has central importance to the development of the discipline. It also has direct

consequences for our lives. Knowledge resistance does not only have an impact on individuals, but also on public health, the environment, and the functioning of democratic societies.

Knowledge About Politics

Understanding resistance to knowledge first requires a brief account of how political science research has examined the nature and extent of the public's knowledge about political topics. This core question of what the public knows about politics has long been an important topic. In a landmark chapter that examines the sophistication of belief systems of the American electorate, Converse (1964) finds that, taken as a whole, the American public exhibits low levels of ideological constraint. Using data from the 1950s, Converse argues that only small slices of the American public think in logically consistent ideological terms. Rather, most Americans do not have a good understanding of “what goes with what”, at least from a normative perspective. While these analyses do not speak directly to surveillance knowledge or belief accuracy regarding specific factual claims, this piece provocatively raised questions about the capacity of the public to perform the task of self-government. This question of competence looms large in the political science research on knowledge – which we see as a strong thematic link to the concept of knowledge resistance.

In broad outline, research examining citizens' political knowledge falls into five (non-mutually exclusive) categories: (1) how to measure political knowledge, (2) examining systematic differences in political knowledge across the population (e.g. differences between men and women), (3) examining the association between political knowledge and various outcomes of interest (e.g. a positive association between survey measures of political knowledge and self-reported voter turnout), (4) the antecedents of political knowledge, and (5) finally how political knowledge and political sophistication moderate other processes (e.g. reception and persuasion of messages from political elites). Additionally, both knowledge and the availability of information may have important effects on whether people vote “correctly” – that is in line with their preferences (e.g. Bartels, 1996; Lau & Redlawsk, 1997; Oscarsson, 2007; Richey, 2008). Interestingly, political institutions may themselves affect the level of political sophistication in the citizenry. Although it is very hard to compare voters' political sophistication across systems, there is at least suggestive evidence that sophistication is higher and more widespread among voters in multi-party systems (Oscarsson & Rapeli, 2018). In this respect, the US context, where most research is conducted, represents an outlier.

Sitting beside these strands of research on knowledge is a related subfield that looks at the extent and correlates of misperceptions, and how to correct them. This latter subfield, which we discuss in greater detail below, is particularly relevant for knowledge resistance because of the research demonstrating that in some instances corrections “backfire” (Nyhan & Reifler, 2010) – paradoxically strengthening misperceptions. While knowledge and knowledge resistance are

inherently linked concepts, the (potential) connection between the two particularly stands out when thinking about how knowledge and sophistication are related to the concept of knowledge resistance. Those who know more about politics or are more sophisticated – those who know “what goes with what”, as discussed by Converse – should be able to more easily engage in the type of directionally motivated reasoning consistent with the backfire effect. As a brief aside, it is important to point out that we use the term backfire consistent with Nyhan and Reifler (2010), which has also been called a “worldview backfire” (Swire-Thompson et al., 2020) to differentiate it from other forms of backfire effects, such as the “familiarity backfire effect” (corrective information remind and possibly reinforce the previous misinformation) (e.g. Ecker et al., 2020) or an “overkill backfire effect” (a more complicated scientific explanation is rejected in favor of a simpler but false alternative) (Ecker et al., 2019).

In turn, this leads us to consider what factors are associated with knowledge resistance (or knowledge acceptance). While it is hard to overstate the lasting impact of Converse’s (1964) chapter on how political science has examined what voters know or understand about politics, another landmark 1964 publication – Hofstadter’s “The Paranoid Style in American Politics” – is newly relevant as social scientists pay new attention to conspiracy theories and populism. While Hofstadter’s essay is not methodologically rigorous by modern social science standards, it nonetheless posits a particular strand of thinking prominent in a minority of the population that comports extremely well with the concept of knowledge resistance. Hofstadter argues that the adherents to this paranoid style often endorse conspiracy views as a form of “manning the barricades of civilization” in a conflict between “absolute good and absolute evil”. While Hofstadter’s essay was ignored for many years in political science, it is newly relevant as recent research has addressed conspiracy beliefs and other forms of knowledge resistance (e.g. Oliver & Wood, 2014; Uscinski et al., 2016).

Knowledge Resistance

While the term “knowledge resistance” historically has not been used in political science research, a number of different conceptualizations of the phenomena of resisting, denying, misusing, or misperceiving basic facts, and other political realities have been key components in analyses of public opinion and electoral behavior, particularly recently. We use the expression “knowledge resistance” as an umbrella term to refer to all cognitive biases that limit or prevent people from accepting available knowledge.

As persuasively argued by Kuklinski et al. (2000), there is an important distinction between being *uninformed* (not knowing something) and *misinformed* (“knowing” something that is not true). This distinction has important implications for political decision making in democratic contexts. Not knowing a crucial piece of information relevant for political decision making may reflect a lack of exposure to information in the first place (or may reflect an online model of political evaluation where details are discarded after an evaluative judgment is

added to an online tally (Lodge, Steenbergen, & Brau, 1995). While not knowing key facts challenge the idea that citizens can meaningfully participate in politics, there may be reasons to be optimistic. A large body of research suggests that the public can successfully rely on heuristics that lead them to reasoned (or at least reasonable) political decisions (Lupia, 1994; Lupia & McCubbins, 1998; Popkin, 1991; Sniderman et al., 1991). Lupia (1994) shows that while voters in a California ballot initiative were able to vote in line with their preferences simply by knowing who was for or against the measure (particularly whether the insurance industry supported or opposed the measure). Lupia argues that because voters who only knew where insurance companies stood on the ballot initiative behaved similarly to those with detailed knowledge implies that knowledge alone is not a reasonable proxy for competence. Rather, if people are able to take cues from elite sources that are aligned with their preferences and values, then they can be viewed as competent. This rosy account of elite cues is less clear when people are misinformed to begin with, and especially when elite cues serve to misinform. There is also a much more dour account of how people use the information at their disposal. There are potentially dire implications of voters being uninformed if politically irrelevant information becomes important to voters when they must attribute responsibility and carry out their tasks' electoral accountability (Achen & Bartels, 2016).

Open questions remain about how strongly people hold factually incorrect beliefs. Some accounts argue that unsupported beliefs are often associated with high levels of confidence in the accuracy of said belief (Kuklinski et al., 2000). However, more recent evidence is far more circumspect (e.g. Graham, 2020). Knowledge resistance may be a function of how strong or certain people are in their factual beliefs, so this is an important line of inquiry for future research.

Motivated Reasoning

The framework of motivated reasoning stems from Kunda (1990) who argues that all information processing has goals. In some situations, people might have accuracy goals; while in other circumstances, the goal may be to reach a particular conclusion (known as directional goals). When choosing household appliances, brand loyalties are probably not so strong that they color how people evaluate information, so accuracy goals are likely to dominate. However, when it comes to evaluating where people have strong prior attitudes – say toward a political party/figure or a beloved sports team – this may influence how people evaluate what they see and hear. How people evaluate otherwise identical policy proposals may be influenced by who is advocating them, just as determining which player is guilty of a foul when watching a sporting event depends on whether one is rooting for a particular team to win the game.

The fact that all reasoning is motivated, but that different goals are salient at different times (and in different contexts), is often lost by the political science shorthand to describe *directionally* motivated reasoning as simply motivated reasoning. Yet, this shorthand makes sense in the context of political science

scholarship of the 1980s and 1990s. Motivated reasoning, particularly *directionally* motivated reasoning, stood in stark contrast to the rational choice/game theory approach that was arguably dominant at the time. Just as behavioral economics forced economists to reconsider whether actual behavior accorded with economic theory, the same was true in political science (though to a much lesser extent – throughout this period political science maintained a robust tradition of directly studying public opinion and behavior). In the rational choice approach, people are assumed to be rational actors who understand the consequences of potential paths of action and choose the path which provides the maximum benefit (Krep, in Lupia, McCubbins). Drawing from this paradigm in economics, landmark work by Downs (1957) on electoral competition provided the basis for a host of rational choice models within the discipline. The resulting spatial models typically downplayed psychological factors and mechanisms in the decision-making process. By downplaying psychological mechanisms, many political scientists in the political psychology tradition found models that postulate that people act “as if” they were utility calculators as useful but ultimately inadequate. While such models worked well empirically, their ability to explain why people behave as they do (versus predictions of how people behave) was found wanting (Bartels, 2002; Epley & Gilovich, 2016).

Resolving the differences between rationalist and psychological accounts of behavior takes a major step forward in Simon’s Nobel Prize winning work around the concept of “bounded rationality”. According to this approach, humans experience limitations when trying to solve complex problems. Like the path-breaking work of Tversky and Kahnemann, observed human decision making is not compatible with a rational utility-maximizing framework. Bounded rationality acknowledges the fact that gathering and evaluating information is costly and that people are constantly exposed to decision making. Consequently, humans need to fall back on cognitive shortcuts or heuristics, which have limitations and can result in biases in the way people make decisions. Even when the model of bounded rationality represented a more realistic portrayal of how humans process information, it still did not explain the underlying mechanism of why this happens. While judgment and decision-making research has become a subfield in its own right, the influence on political science models remains significant. When considering how to reconcile “pure” rational choice with more bounded rationality, the solution was to strip away assumptions of pure rationality down to a single assumption that actors engage in maximizing behavior. In this regard, the rational choice approach conceptually can sit rather easily alongside the motivated reasoning approach. The only challenge is to know what is being maximized (rational choice) or which goal is primary at a given point in time (motivated reasoning). Of course, knowing these proves to be the difficult part.

Models of Learning About Politics

The tension between the “rationalist” and “psychological” accounts of how people possess, incorporate, and apply information can most clearly be seen in

models of political learning. Achen (1988, 1992) and Gerber and Green (1999) proposed a novel conception of political learning formalized in a Bayesian model (Bartels, 2002). This alternative understanding of political preference formation elaborated on the limitations of the rational choice model. In a nutshell, citizens base their evaluations on retrospective evaluations that are constantly updated on a “running tally” in order to make prospective rational political choices.

Around the early 2000s, the impact of motivation on political preference formation began to take center stage in political science behavioral research. With this growing interest in the role that motivation plays in information processing politics (whether accuracy or directional goals were primary), there was a concomitant need to rethink the theoretical basis driving empirical studies in the field. At the time, memory-based models led to the understanding of political preference formation. In short, this approach posited that people make decisions by bringing available information to the fore, and then forming a judgment from what was available. This account proved problematic for two reasons: first, human memory is constrained in how many pieces of information can be stored in working memory (typically five to seven “chunks”); and second, these models often came with an (implicit) assumption that such information was stored free of affect. But what if the information constantly updated in memory was not stored neutrally, but also carried positive or negative affective tags alongside it (Steenbergen & Lodge, 2003)? These affective tags could serve as a powerful heuristic that could influence evaluations (Redlawsk, 2001, 2003). (For more details on the turn from memory-based models to the continuous updating via a running tally, please see the Solhlberg chapter in this volume.)

The introduction of affect in a more serious and systematic way further advances our understanding of how people acquire and evaluate information. Marcus and MacKuen (1993; also see Marcus, Neuman, & MacKuen, 2000) explicitly provide an important role for anxiety (a negatively valenced affective state) in motivating (political) learning. Lodge and Taber (2000) advance a tripartite model that integrates affect and cognition through three key elements: the hot-cognition hypothesis, online processing, and the “how do I feel?” heuristic. The hot-cognition hypothesis posits that all social information is affectively charged and is activated automatically. When applied to political decision making, this means that whenever people think of and evaluate policy issues, political candidates, or political parties, the information is associated with an affective tag. These affective tags are created and updated through an online process – people automatically generate affective tags, which can vary in both valence (negative or positive) or strength (strong or weak), when encountering a stimulus. These tags get stored in memory along with the attitude object, and the information used to create them may be discarded (Lodge et al., 1995). Finally, when people are confronted with the evaluation of a political object (explicit or implicit), the “how-do-I-feel?” heuristic comes to play, which is not cognitively taxing because the affective information is easily available. This cognitive shortcut signals the individual the affective value of a specific object by moving the label into working memory.

Motivated reasoning theory allows the possibility that people's preferences can affect both the search and processing of (new) information. Unlike Converse's characterization of the public into different levels of sophistication, this approach accepts that all citizens could be biased reasoners, depending on what information processing goal is primary. Importantly, "biased" here does not mean that people process information incorrectly, but rather that they are systematically influenced by internal and external factors that often cannot be separated from the evaluation. In some cases, it might be impossible to treat evidence fairly. As Leeper and Slothuus (2014, p. 138) put it: "goal", "motivation", and "need" are conceptual synonyms, and this broad definition allows motivated reasoning to take many forms, depending on what goals individuals are striving toward and the reasoning strategies they adopt to satisfy those goals.

Motivated reasoning would perhaps not be a concern in the political arena if accuracy goals were always dominant. Rather, lots of research treats *directionally* motivated reasoning as the default (e.g. Lodge & Taber, 2013; Redlawsk, 2001). Indeed, *directionally* motivated reasoning is consistent with a whole host of phenomena regarding the consumption and persuasiveness of information that are relevant to knowledge and knowledge resistance, including selective exposure (e.g. Dahlberg, 2021; Guess et al., 2018; Stroud, 2008, 2010) and elite cues (e.g. Bullock, 2011; Nicholson, 2012; Zaller, 1992), both of which are relevant to the journalistic fact-checking.

Fact-Checking

Political science and communication research on fact-checking is perhaps the research area most fully intertwined with the concept of knowledge resistance. Since fact-checking is considered a potential antidote for the problems associated with knowledge resistance, research in the field gained prominence over the last years. While journalism has long employed fact-checkers to make sure elements of a story are correct (such as getting dates, figures, and quotations correct), fact-checking as a journalistic form evaluating the accuracy and veracity of claims made by politicians represents a radical turn in the practice of journalism (Graves et al., 2016). Early pioneers in this space include factcheck.org and Spinsanity, both of which started in the US in the early 2000s. Factcheck.org in particular had its roots in American "ad watches" that assessed the accuracy of televised campaign commercials in US elections. (These are perhaps not surprising given that the scale and ubiquity of televised political advertising in the US is unmatched in any other country.)

Fact-checking as a political form was particularly advanced in the mid-2000s with the creation of PolitiFact by the journalist Bill Adair. While this form of journalism directly evaluates the accuracy (or truthfulness) of statements by politicians, PolitiFact differed from predecessors (and continues to differ from many contemporaries) by rendering clear judgments with its playful "Truth-O-Meter". In addition to starting PolitiFact in the US, Bill Adair also helped internationalize the journalistic form through helping found the International

Fact-Checking Network (IFCN). This organization was created to coordinate fact-checking efforts in a connected world, and to share best practices. To date, there are 29 verified signatories – which require accepting the IFCN Code of Principles – from 17 countries in the alliance, including organizations in every continent.²

With the growing concern for the spread of online misinformation, so have proliferated different journalistic practices as attempts to correct false facts. Traditionally, fact-checking referred to the internal procedures of news agencies to verify facts and statements before publication (Graves & Amazeen, 2019). In recent years, the questioning of professional values within journalism resulted in a quest for rekindling the truth-seeking principles and gave room to the proliferation of independent fact-checking organizations. Fact-checking organizations systematically publish reports assessing the accuracy of claims made in the public sphere. They aim at educating the general public, influencing political actors, and improving the quality of journalism (Amazeen, 2017).

Although the fact-checking movement has gained prestige and recognition in terms of their prescriptive value for democracy (Graves et al., 2016), it is still not clear if they are thriving to mitigate the effects of misinformation. Additionally, since fact-checking as we know it nowadays is relatively new, empirical measures of its effectiveness are still in the making. While correcting false claims is not the only or even main goal of political fact-checking organizations (Amazeen, 2017), it has probably become the most challenged one because of the contested nature of political statements. A number of studies have begun to examine whether fact-checking can actually change people's beliefs. So far, however, the literature is divided and there has been no conclusive evidence in either direction.

The first fact-checking initiatives were developed under what in science communication is called the information deficit model. This model wrongly assumes that public misperceptions are caused by a lack of knowledge, and so, the straightforward solution to the problem would be to provide the public with correct information (Cook & Lewandowsky, 2011). However, the developments on cognitive processes research brought about a change of perspective into political debunking. Political issues are contentious by nature and that distinctive feature makes people more prone to processing political information under directional goals (Taber et al., 2009, Taber, & Lodge, 2006). The understanding of political information processing within the motivated reasoning framework has evident consequences on under what conditions corrections can effectively change people's beliefs. In fact, these theoretical developments have been central to the research agenda of fact-checking effectiveness, and consequently have fueled changes on the way in which corrections are delivered.

Fact-Checking: Under What Conditions Are Corrections Effective?

Although the empirical evidence on the topic is strongly divided, a growing body of research has provided some insights on this question (see [Table A1](#)). Some

studies and recent meta-analyses have reported that corrections have a significant effect for debunking misinformation, even controlling for measurement error (see Walter & Murphy, 2018 for a meta-analysis). Conversely, another branch of the literature finds that corrections have little to no effect changing people's minds. Or even worse, sometimes corrections can even backfire. Focusing on corrections on neutral scenarios, seminal papers by Wilkes and Leatherbarrow (1988) and Johnson and Seifert (1994) already suggested that there is a continued influence effect. Namely, once people are exposed to misinformation and form their beliefs based on erroneous cues, it becomes difficult to reset their beliefs to baseline compared with people who have not been exposed to misinformation in the first place. More recent papers based on the same research paradigm in which people are presented with a report of a non-contentious fictitious event and then exposed to a retraction reach similar findings (Ecker et al., 2010; Ecker et al., 2011a; Ecker et al., 2011b).

Leaving the neutral scenarios behind and focusing on the correction of political phenomena, Nyhan and Reifler (2010) suggested that corrections are often not effective for debunking misperceptions. When exposed to corrections to misleading claims from politicians in mock news articles, responses varied significantly according to the experimental subjects' ideological position. In general, just like people are more likely to believe information that is consistent with their priors, they are also more likely to resist counter-attitudinal corrections. As a matter of fact, some studies find that counter-attitudinal corrections can even produce a backfire effect (also referred to as backlash or boomerang effect) in some cases, strengthening misperceptions of the targeted group (Nyhan & Reifler, 2010; Nyhan et al., 2013). This can happen not only because of direct refutation of people's priors, but also because of how correcting misinformation might increase familiarity with the issue, boosting its power to spread (Berinsky, 2017).

Nevertheless, the bulk of evidence suggests that these "backfire effects" are rare. The evidence on the backfire effect is contested in the literature and might not provide robust enough results to consider it a phenomenon extended across the population and all kinds of corrections (Swire-Thompson et al., 2020). For instance, Guess and Coppock (2020) examined the prevalence of backlash across three survey experiments (two on Mechanical Turk samples and one on a nationally representative sample). Although they suggest that their results might not replicate in strongly antagonistic political contexts, the authors found that backlash is much more rare than suggested by previous research. Additionally, Wood and Porter (2019) conducted five different studies where they corrected claims across 52 policy areas designed to tap into relevant ideological symbols along the political spectrum. On a pooled sample of 10,100 subjects for all the experiments combined, they observed that subjects were receptive to the corrections and were able to update their beliefs according to the new information they were presented with. Even more so, this was also the case when corrections directly challenged the subjects' ideological position. However, there might be a relevant difference if people are publicly corrected. A recent study exploring

the consequences of being corrected on Twitter found that those who were publicly corrected increased their partisan slant and hostile language on subsequent tweets (Mosleh et al., 2021). Mosleh et al. (2021) suggest that being publicly corrected shifts attention away from accuracy.

The fact that misperceptions are effectively corrected does not necessarily imply that corrections reset attitudes. Thorson (2016) conducted three between-subjects experiments in which she compared the attitudes of individuals exposed to corrected misinformation to the attitudes of those who were not. The author found that even when people's beliefs were successfully updated, their attitudes were still affected by the original piece of misinformation. Because exposure to misinformation generates strong affective responses that fact-checks can almost never match, people's evaluation of new information might be more influenced by misinformation than by its correction (Thorson, 2016).

Fact-Checking Attitudes

In line with the growing body of evidence supporting motivated reasoning theory, a number of studies have suggested that fact-checking might be more effective on some audiences than others. Meaning that there is an asymmetric resistance to fact-checking associated with certain demographics, political ideology, and political attitudes. For instance, studies analyzing fact-checking attitudes in the US find citizens are strongly divided along partisan lines. Democrats are more likely to feel favorably toward fact-checking than Republicans (Nyhan & Reifler, 2015; Shin & Thorson, 2017). This can be due to many different reasons. At least until recently, familiarity with fact-checking was low (Nyhan & Reifler, 2015) and so, fact-checking attitudes might be reflecting general media attitudes.

American conservatives are more likely to perceive media bias (Dimock et al., 2013) and feel less trust toward mass media in general (Gottfried et al., 2019; Hamilton & Hern 2017). It could also be the case that fact-checking organizations review the claims of a given party, increasing the chances that their voters feel more lenient toward them. In fact, American fact-checkers have reviewed the claims of Republicans more often and flagged false content in them more often as well (Card et al., 2018; Ostermeier, 2011). Regardless of the explanation behind this (more prevalence of false statements among Republican politicians or selection bias among fact-checkers), this trend is likely to result in asymmetric attitudes toward this journalistic practice. Fact-checking attitudes also have some behavioral correlates that might amplify the development of in-group attitudes. The chances of posting a fact-check to one's social media account increased with age, liberal ideology and among those most likely to seek out political information on social media and Republicans are more prone to hold negative views toward fact-checking and fact-checking organizations (Amazeen et al., 2018). Additionally, fact-checks posted on social media hold higher chances of engaging users when they come from friends compared to news outlets (Margolin, Hannak, & Weber, 2018).

Given that people's fact-checking attitudes might often be derived from their media attitudes more broadly speaking, it does not come as a surprise that countries in which institutional trust is higher and public media are well-regarded citizens also show greater support for fact-checking. Through an analysis of attitudes toward fact-checking across six European countries, Lyons et al. (2020) found that in Northern European countries (Sweden and Germany) people are more familiar with the concept and also more accepting when compared with Italy, Spain, France, and Poland. Although their study finds between-country heterogeneity, it also suggests that prior political views play a key role in fact-checking attitudes that go beyond national differences. Specifically, the main cleavages associated with fact-checking attitudes in Europe were the left–right dimension and what could be referred to as a mainstream vs anti-elite dimension. Consistent with previous research, Lyons et al. (2020) found that people who are more inclined to the left, pro-EU and more satisfied with democracy hold more favorable views toward fact-checking.

While fact-checking organizations are mostly associated with their mission to debunk false claims, they also aim at reducing the amount of falsehoods in politicians' public statements altogether. The idea is that by acting as watchdogs who hold politicians accountable for their claims, there will be a higher price to pay for deceiving the public in the long run. Although this phenomenon received less scholarly attention compared to the effectiveness of corrective messages on citizens' attitudes and beliefs there is some evidence that fact-checking has an effect over political elites. Through a field experiment, Nyhan and Reifler (2015) find that exposing legislators in nine US states to a reminder of the reputational risks of having their claims publicly verified significantly reduced the likelihood that they would receive a negative fact-checking label or even have the accuracy of their claims challenged by fact-checkers.

It should be noted that the fact that this study was designed as a field experiment makes the results very rich in insights on real-life legislators' behavior, but it also implies certain limitations to their scope. In the first place, the experiment was constricted to the states where there was an operating fact-checking organization. This might mean that those states already had voters reclaiming more accountability from their legislators and thus, a higher reputational risk for legislators. Additionally, the experiment treated legislators with a message reminding them of the reputational risks they run if they were publicly exposed by fact-checkers and this is not a usual practice of fact-checking organizations. Overcoming this limitation from Nyhan and Reifler's study (2014), Lim (2018) analyzes whether an actual correction by fact-checkers affects politicians' tendency to echo an inaccurate statement. Lim (2018) finds that if a fact-checking agency qualified a claim as false, presidential candidates for 2012 and 2016 elections in the US decreased their probability of repeating the false statement by 9.5 percentage points.

On the flipside, candidate evaluations and voting intentions seem to be affected by fact-checks. Wintersieck (2017) finds that the presence of corrective

fact-checks during political debates impacts debate performance evaluations and the chances of voting for a given candidate. However, the effect of the presence of a fact-check pointing at mixed evidence resembled that of no fact-check at all, challenging the truthfulness rating scales that most fact-checking organizations rely on.

The Political Science of Knowledge Resistance

In recent years, there has been a paradigm shift when it comes to comprehending how reasoning works. Within political science, this new understanding of information processing through a model that integrates affect and cognition resulted in rich insights into people's political beliefs, attitudes, and behavior. The motivated reasoning framework boosted our grasp on how people develop their political knowledge and why in some cases they might resist facts even when they are spoon fed the best available evidence. We learned that there is a relevant distinction between being uninformed and misinformed. While the former is linked to lack of interest or lack of information, the latter is rather associated with directionally motivated reasoning.

Knowledge resistance can have dire consequences for individuals and societies. With the growing concern about the spread of misinformation and its consequences, debunking citizens' erroneous beliefs became a central undertaking for democratic societies. Even when they have received harsh criticism, fact-checking organizations were put in the spotlight as the rightful stakeholders to do so. Although there are still inconclusive results regarding the effectiveness of fact-checking, we know that there is an asymmetric resistance to fact-checking associated with certain demographics, political ideology, and political attitudes. In broad lines, people are more likely to believe information that is consistent with their priors and more likely to resist counter-attitudinal corrections. And despite the fact that early papers examining resistance to counter-attitudinal corrections found a "backfire effect", more recent developments in the field showed that backlash is rare.

Even when the literature is optimistic regarding the ability of corrections to improve the accuracy of people's factual beliefs, it is not that clear that fact-checking is effective at resetting attitudes. Since exposure to misinformation produces strong affective responses that corrections can rarely match, people's evaluation of new information seems to be more staunchly influenced by misinformation than by its correction. Further research is needed to better understand if and how the updating of factual beliefs transcends those specific beliefs to affect attitude formation or behavior.

As we have repeatedly mentioned along the chapter, knowledge resistance has direct implications in public life. Therefore, how to combat knowledge resistance will continue to be a fundamental question for democratic societies in the near future. And so, political science faces new challenges translating those real-life concerns into research questions that advance theoretical developments and profit from new methods. Ultimately, novel findings on the field should aim

at informing policy decisions for all relevant stakeholders such as journalists, fact-checking organizations, and politicians.

Notes

- 1 <https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019>.
- 2 <https://www.poynter.org/ifcn-fact-checkers-code-of-principles/>.

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Appendix Key fact-checking papers and meta analyses

Table A.1 contains a list of key papers and meta-analyses that examine the effectiveness of providing corrective information in some form. While not an exhaustive list, these articles represent important contributions to this emerging field.

Table A.1 Key Papers and Meta-Analyses of the Effects of Fact-Checking on Misperceptions

<i>Paper</i>	<i>Year</i>	<i>Authors</i>	<i>Description</i>	<i>Main Findings</i>
When Corrections Fail: The Persistence of Political Misperceptions	2010	Nyhan & Reifler	Tests the effects of corrections to misleading claims from politicians	<ul style="list-style-type: none"> • Corrections are often not effective for debunking misperceptions. • Corrections might sometimes backfire.
The Effect of Fact-Checking on Elites: A Field Experiment on US State Legislators	2015	Nyhan & Reifler	Field experiment assessing the impact of fact-checking on politicians.	<ul style="list-style-type: none"> • Exposing legislators to a reminder of the reputational risks of having their claims publicly verified reduced the likelihood of them receiving a negative fact-checking label or having their claims challenged by fact-checkers.
The Elusive Backfire Effect: Mass Attitudes' Steadfast Factual Adherence	2019	Wood & Porter	Test effect of corrections on multiple outcomes	<ul style="list-style-type: none"> • Backfire effect is not as prevalent as previously suggested. • Subjects are receptive to corrections and are able to update their beliefs according to new information even when corrections directly challenge their ideological position.
Reinforcing Attitudes in a Gatewatching News Era: Individual-Level Antecedents to Sharing Fact-Checks on Social Media	2018	Amazeen, Vargo & Hopp	Examines individual-level predictors of sharing fact-checks on social media	<ul style="list-style-type: none"> • Sharing fact-checks on social media is associated with age, ideology, and political behaviors.
Debating the Truth: The Impact of Fact-Checking During Electoral Debates	2017	Wintersieck	Experiment testing the effect of fact-checking on individuals' attitudes and evaluations of political candidates	<ul style="list-style-type: none"> • Presence of corrective fact-checks during political debates impacts debate performance evaluations and the chances of voting for a given candidate.

(Continued)

Table A.1 Key Papers and Meta-Analyses of the Effects of Fact-Checking on Misperceptions (*Continued*)

<i>Paper</i>	<i>Year</i>	<i>Authors</i>	<i>Description</i>	<i>Main Findings</i>
How Politics Shape Views Toward Fact-Checking: Evidence from Six European Countries	2020	Lyons, Merola, Reifler, & Stoeckel	Examine attitudes toward fact-checking across six European countries	<ul style="list-style-type: none"> • There is greater familiarity with and acceptance of fact-checking in Northern Europe (Sweden and Germany) than other areas (Italy, Spain, France, and Poland). • The main cleavages associated with fact-checking attitudes in Europe were the left-right dimension and mainstream vs anti-elite dimension.
Partisan Selective Sharing: The Biased Diffusion of Fact-Checking Messages on Social Media	2017	Shin & Thorson	Test effects of partisanship on sharing and commenting trends using large Twitter datasets.	<ul style="list-style-type: none"> • Partisanship influences patterns of online sharing and commenting on candidate fact-check rulings. Individuals are more likely to selectively share fact-checking messages that favor their own candidate and disfavor the opposing party's candidate.
Belief Echoes: The Persistent Effects of Corrected Misinformation	2015	Thorson	Conducts experiments testing whether exposure to negative political information continues to shape attitudes even after being effectively debunked.	<ul style="list-style-type: none"> • Even when people's beliefs are successfully debunked, their attitudes can still be affected by the original piece of misinformation.
Does Counter-Attitudinal Information Cause Backlash? Results from Three Large Survey Experiments	2018	Guess & Coppock	Examines the prevalence of backlash through survey experiments	<ul style="list-style-type: none"> • Backlash effects are much rarer than suggested by previous research.

(Continued)

Table A.1 Key Papers and Meta-Analyses of the Effects of Fact-Checking on Misperceptions (*Continued*)

<i>Paper</i>	<i>Year</i>	<i>Authors</i>	<i>Description</i>	<i>Main Findings</i>
Rumors and Health Care Reform: Experiments in Political Misinformation	2017	Berinsky	Explores beliefs in political rumours after their debunking	<ul style="list-style-type: none"> • Attempts to debunk rumours by directly refuting them might increase the public's familiarity with it and amplify its power.
The Hazards of Correcting Myths About Health Care Reform	2013	Nyhan, Reifler, & Ubel	Experimentally tests if more aggressive fact-checking can debunk health care reform myths	<ul style="list-style-type: none"> • Counter-attitudinal corrections can produce a backfire effect, even among those who show higher levels of political knowledge.
Can Fact-checking Prevent Politicians from Lying?	2018	Lim	Analyzes if corrections by fact-checkers affects politicians' tendency to echo inaccurate statements.	<ul style="list-style-type: none"> • If a fact-checking organization labeled a claim as false, presidential candidates decreased their probability of repeating the false statement.
Perverse Downstream Consequences of Debunking: Being Corrected by Another User for Posting False Political News Increases Subsequent Sharing of Low Quality, Partisan, and Toxic Content in a Twitter Field Experiment	2021	Mosleh, Martel, Eckles, & Rand	Explores the consequences of being corrected on Twitter	<ul style="list-style-type: none"> • Those who are publicly corrected increase their partisan slant and hostile language on subsequent tweets. • Being publicly corrected shifts attention away from accuracy.

(Continued)

Table A.1 Key Papers and Meta-Analyses of the Effects of Fact-Checking on Misperceptions (*Continued*)

<i>Meta-Analyses/Systematic Reviews</i>	<i>Year</i>	<i>Authors</i>	<i>Main Conclusions</i>
How to Unring the Bell: A Meta-analytic Approach to Correction of Misinformation	2018	Walter & Murphy	<ul style="list-style-type: none"> • Misinformation in the context of politics and marketing is more difficult to correct than in the health domain. • Correction of real-world misinformation is more challenging than constructed misinformation. • Rebuttals are more effective than forewarnings. • Appeals to coherence outperform fact-checking and appeals to credibility
Who Uses Fact-Checking Sites? The Impact of Demographics, Political Antecedents, and Media Use on Fact-Checking Site Awareness, Attitudes, and Behavior	2020	Robertson, Mourao & Thorson	<ul style="list-style-type: none"> • Fact-checking sites appeal especially to liberals and liberal/mainstream news consumers. • Other predictors of awareness, attitudes and behaviour might be related to consuming fact-checking articles, but not as strongly as ideology.
A Meta-Analytic Examination of the Continued Influence of Misinformation in the Face of Correction: How Powerful is it, Why Does it Happen, and How to Stop it?	2019	Walter & Tukachinsky	<ul style="list-style-type: none"> • On average, corrections do not entirely eliminate the effect of misinformation. • Corrective messages were found to be more effective when they are consistent with the audience's worldview, and also when they are delivered by the source of the misinformation itself. • Corrections are less effective if the misinformation was attributed to a credible source or if the misinformation has been repeated multiple times prior to correction.
Fact-Checking: A Meta-Analysis of What Works and for Whom	2019	Walter, Cohen, Holbert, & Morag	<ul style="list-style-type: none"> • Fact-checking has a significantly positive overall influence on political beliefs. • The effects of fact-checking weaken when using "truth scales" or refuting only parts of a claim • Correction of political misinformation with fact-checking is less effective when they are not consistent with participants' preexisting beliefs, ideology, and knowledge.
Fighting Misperceptions and Doubting Journalists' Objectivity: A Review of Fact-checking Literature	2018	Niemen & Rapeli	<ul style="list-style-type: none"> • Findings are mixed. • Some find that fact-checking reduces misperceptions. • Others find that corrections are often ineffective. • The literature is overwhelmingly focused in the US context.
Debunking: A Meta-Analysis of the Psychological Efficacy of Messages Countering Misinformation	2017	Chan, Jones, Hall Jamieson, & Albarracín	<ul style="list-style-type: none"> • Both being exposed to misinformation and debunking show large effects. • Persistence of misinformation after debunking was stronger when audiences generated reasons in support of the initial misinformation. • A detailed debunking message correlated positively both with the debunking effect and the misinformation-persistence effect.

10 Uninformed or Misinformed? A Review of the Conceptual– Operational Gap Between (Lack of) Knowledge and (Mis)Perceptions

*Elina Lindgren, Alyt Damstra, Jesper Strömbäck,
Yariv Tsfati, Rens Vliegenthart and
Hajo Boomgaarden*

Introduction

A core assumption of democratic theory is that citizens should have sufficient knowledge of politics and current affairs to be able to make informed decisions (Dahl, 1998; Wikforss, 2021). This has made the study of political knowledge an integral part of research on political opinion and behavior (Bartels, 1996; Zaller, 1992) as well as political communication (Aalberg & Curran, 2012; Esser et al., 2012; Shehata & Strömbäck, 2021). Traditionally, failure to correctly answer political knowledge questions has been interpreted as a lack of knowledge (Bartels, 1996). Over the last decade, however, increasing attention has been paid to the notion that people might also fail to answer correctly because they firmly believe in another and factually incorrect answer – that is, they hold misperceptions (Flynn et al., 2017; Kuklinski et al., 2000). From the perspective of knowledge resistance, this distinction between failure to correctly answer questions because of lack of knowledge versus holding misperceptions is crucial. This chapter thus addresses this distinction and reviews how misperceptions have been separated from lack of knowledge on the conceptual level as well as in empirical studies.

In contrast to the uninformed, people holding misperceptions may very well be informed. However, the information they consumed was either flawed, or they drew incorrect inferences from it – something which is often attributed to cognitive biases, “directional motivations” to protect core values and existing beliefs, and knowledge resistance (Klintman, 2019; Kunda, 1990). While the theoretical differences between being uninformed and holding misperceptions may seem relatively straightforward, differentiating the concepts empirically is challenging. This holds particularly true on issues that are subject to political controversies. Consider, for example, questions about global warming or the benefits of vaccination. Should an answer that global warming is due only to

natural causes be interpreted as a lack of knowledge or misperceptions about climate change? Is an incorrect answer that vaccines can infect people with diseases a sign of lack of knowledge or false beliefs that vaccines are harmful?

Incorrect answers on items such as those above have been interpreted both as lack of knowledge and misperceptions. Within the climate domain, for example, Kahlor and Rosenthal (2009) interpret respondents' failure to correctly identify the causes of global warming as a lack of knowledge, whereas Hmielowski et al. (2014) understand incorrect answers as indicators of misperceptions – based on the same type of survey items. Similarly, the incorrect claim that the influenza vaccine can infect people with influenza has been interpreted both as a lack of knowledge (Zhang et al., 2011) and as a misperception (Daley et al., 2007).

Such diverging interpretations are problematic, as they impact inferences about implications for society. For example, misperceptions may have more profound consequences for society than the absence of knowledge and beliefs. If people hold firm beliefs that are not compatible with the best available evidence, this will increase the likelihood of people making decisions that do not match the preferences they would have if they were correctly informed (Kuklinski et al., 2000) and to refrain from taking possibly life-important actions, such as to vaccinate against infectious diseases (Martinello et al., 2003). Furthermore, if some hold (negative) misperceptions about certain groups of people in society, this might cause substantial harm to these groups as well as to society at large (Sides & Citrin, 2007). Second, the two phenomena may require different remedies. An incorrect answer due to a lack of knowledge should be possible to remedy by providing factual information, and efforts should thus be targeted at providing such information. Misperceptions based on and maintained by directionally motivated reasoning can be much more challenging to correct, as people may have strong incentives to hold on to them (Kunda, 1990; Taber & Lodge, 2006). In these cases, interventions may also require additional tools, such as inducing “accuracy motivations” among recipients to counteract rejections due to directional motivations (van Stekelenburg et al., 2020), and finding the platforms and sources that can best reach, and are the most trusted, by a targeted audience (Vraga & Bode, 2018).

Against this background, the aim of this chapter is twofold. First, to provide an overview of how uninformed have been distinguished from those who hold misperceptions conceptually and operationally in the existing literature. Second, and based on that review, to outline a framework for addressing the conceptual–operational gap in future research. Our argument is that in order to draw reliable conclusions about why people answer knowledge questions incorrectly, we must first conceptually acknowledge that there are more reasons for giving the wrong answer than lack of knowledge or false beliefs. Second, we need to move from striving for universal solutions for conclusively identifying and separating those groups in surveys, and toward more fine-tuned research questions with survey designs tailored specifically to address certain aspects of public knowledge.

Uninformed and Misinformed on the Conceptual Level

In representative models of democracy, politicians, public administrations, and the media are supposed to provide citizens with the information they need to understand politics and make informed political decisions. Citizens, on their part, are expected to make use of available information and inform themselves (Dahl, 1998). Within this framework, when citizens fail to answer knowledge questions about political matters, it can be seen as the result of 1) political elites or the media not informing the public properly, or 2) citizens being unwilling or unable to absorb or interpret the information provided to them. In either case, the central issue is that citizens do not possess the knowledge necessary to be able to orient themselves politically and form well-grounded beliefs and attitudes (Bartels, 1996).

As noted in the introduction, this division of citizens as being either informed or uninformed ignores the fact that people might believe in the wrong answer – something which should be considered distinct from a lack of knowledge and beliefs. As argued by Kuklinski et al. (2000): To be *informed*, people must have factual beliefs on an issue, and those beliefs must be accurate. If people do not hold factual beliefs, they are *uninformed*. But some people have beliefs that contradict reality and the best available evidence, and those people should be conceptualized as *misinformed*. In existing research of misperceptions, those individuals are typically conceptually distinguished from the uninformed (those who lack factual beliefs and answer correctly or incorrectly on knowledge questions merely by chance, Kuklinski et al., 2000), as individuals that hold firm (Kuklinski et al., 2000), confident (Pasek et al., 2015), or deep-seated (Berinsky, 2018) beliefs in the incorrect answers. Those beliefs are considered incorrect if they are based on flawed information, or, if the information was correct, the individual has drawn incorrect inferences from it (Flynn et al., 2017). Because people that hold misperceptions typically base this on some type of information, those people – in contrast to those who lack knowledge – often consider themselves to be well-informed (Flynn et al., 2017; Kuklinski et al., 2000).

Drivers of (Lack of) Knowledge and (Mis)Perceptions

What makes someone uninformed or misinformed in political matters can be explained by context- as well as individual-level factors. On the contextual level, the main factor concerns the supply of information. In research on political knowledge, one focus has thus been on the political information environments in which people live and whether these provide citizens with sufficient information to become knowledgeable (Aalberg & Curran, 2012; Esser et al., 2012; Jerit et al., 2006; Van Aelst et al., 2017). Regarding the formation of misperceptions, the literature mainly focuses on the *accuracy* of the available information. To understand why people are informed or not, as well as why some hold misperceptions, actions of those responsible for disseminating political information thus need consideration (Flynn et al., 2017). Given that political communication

is heavily mediated, many scholars have focused on the role of the news media as providers of political information (Aalberg & Curran, 2012). Since a key role of news media is to present citizens with the kind of information they need to be “free and self-governing” (Kovach & Rosenstiel, 2014), news consumption is generally presumed to generate knowledge (Jerit et al., 2006; Shehata & Strömbäck, 2021).

However, the news media may also contribute to the dissemination of *false and misleading information* (Tsfati et al., 2020). First, news media may disseminate false information because trusted sources (intentionally or unintentionally) provide them wrong information, not least when such information is backed by partial, or seemingly true, evidence. Second, authoritative figures may provide information that is not true or compatible with the best available evidence, and by covering these communications, even though the purpose may be to debunk false information, mainstream media may inadvertently contribute to the spread of it (Tsfati et al., 2020). Finally, the norm of balanced reporting can also contribute to the spread of misinformation, as journalists feel compelled to provide different views on contested issues.

Besides mainstream news media, people have increasing access to ideologically oriented news channels and partisan media, which tend to be more influenced by, and pay more attention to, false and misleading information compared to mainstream media (Benkler et al., 2018; Vargo et al., 2017). Such partisan alternative media are more likely to spread misleading statements that support a certain political position, and to disseminate pure disinformation (Benkler et al., 2018; Donsbach, 2004; Jamieson & Cappella, 2008).

While the supply of (mis)information in the news media can be expected to play a role for both (lack of) political knowledge and misperceptions, to understand among whom the information is influential, it is important to consider how individuals process and react to political information. While knowledge as a phenomenon is discussed in many theories, most knowledge theories can be placed within the broader concept of “schema theory” (Axelrod, 1973; Craik, 1943). In short, schemas refer to organized arrangements of related bits of information, which are stored in long-term memory and form the framework through which we understand the world. The more developed the schemas are, the more useful they are for obtaining and interpreting new information. If someone has a thorough understanding of a complex process, this schema can inform the person about a similar process when (s)he encounters it for the first time, thereby helping her/him to understand the phenomenon faster and better.

However, as Kahlor and Rosenthal (2009) point out (p. 384), schemas are only useful or productive for gaining accurate knowledge if they contain accurate information, and, at least as important, it requires the individual to be motivated by “accuracy goals” (Kunda, 1990; Taber & Lodge, 2006). If people are motivated by directional goals, such as to protect identity markers or to confirm existing beliefs, reasoning skills, and developed schemas can, perversely, also facilitate the formation of misperceptions. The reason is that people with more sophisticated knowledge structures may be better not only at comprehending

new information but also at counterarguing information that contradicts their prior beliefs (Kunda, 1990; Taber & Lodge, 2006). Simply put, while well-developed schemas should facilitate the formation of knowledge when people have accuracy goals, misperceptions, which tend to be driven by cognitive biases and occur when people are motivated to arrive at a certain, desired conclusion (Flynn et al., 2017; Kuklinski et al., 2000), may sometimes be aided by well-developed existing knowledge structures (Taber & Lodge, 2006).

While (lack of) knowledge and misperceptions can be expected to depend on both the availability and type of information disseminated and on cognitive mechanisms for processing information, to understand who remains uninformed and who develops misperceptions, one must also consider individual factors that may moderate each process. Two factors that play a central role in this context are issue-specific attitudes and partisanship. If people were driven solely by accuracy goals when dealing with political information, it would be easy to identify those who answer knowledge questions incorrectly as uninformed. However, since people are also likely to have directional goals, such as protecting core values and partisan and political identities (Kahan, 2016a, 2016b; Kunda, 1990; Taber & Lodge, 2006), they may respond incorrectly because their priors led them to access and/or interpret information in ways that support an incorrect answer. For example, people with strong party identities and attitudes that deviate from those disseminated in mainstream news media may selectively turn to alternative and partisan media for news (Benkler et al., 2018; Knobloch-Westerwick, 2014; Zaller, 1992), which may increase the likelihood of encountering biased or misleading information (Vargo et al., 2017). Similarly, people who sympathize with parties with positions that deviate from the best available evidence (Jerit & Barabas, 2012; Prior et al., 2015; Zaller, 1992), or themselves have such attitudes (Flynn, 2016; Kuklinski et al., 2000), may be more likely to counter-argue factual evidence while uncritically accepting biased or misleading statements. Other variables that may influence whether people learn from news or form misperceptions are for example education, which provides greater capacity to integrate and scrutinize new information (Flynn, 2016; Jerit et al., 2006), and trust in the source, such as news media, which may condition the extent to which people expose themselves to and accept factual information provided by these sources (Damstra et al., 2021; Miller & Krosnick, 2000; Strömbäck et al., 2020).

Uninformed and Misinformed on the Operational Level

While it seems possible to differentiate those who are uninformed from those who hold misperceptions on a conceptual level, it is more challenging in empirical studies. Previous reviews have revealed that political knowledge (Barabas et al., 2014; Delli Carpini & Keeter, 1996), as well as misperceptions (Flynn, 2016), are typically measured by asking respondents to evaluate one or several factual statements (items), often summed in indices. The items are generally closed-ended, and they may be measured with Likert-type scales (such as a

five-point disagree-agree scale), multiple-choice-, or binary true/false categories. The content of the questions can differ across issue domains, as well as to what degree the issues are contested (Barabas et al., 2014; Damstra et al., 2021; Delli Carpini & Keeter, 1996). On some types of questions, it may be reasonable to consider people as being either informed or uninformed and infer incorrect answers to be due to a lack of knowledge. These are questions that target textbook-like factual knowledge and which are not subject to political controversies, such as the number of seats in the congress, or the name of a certain minister (Barabas et al., 2014; Delli Carpini & Keeter, 1996). However, there are also many political issues on which it is more difficult to find specific survey questions that can be exclusively said to measure (lack of) knowledge or (mis)perceptions. This is particularly the case on issues that are more salient, politicized, and contested – such as whether human behavior contributes to global warming (Kuklinski et al., 2000; Flynn et al., 2017). As opposed to textbook-like facts, that by their nature most often are either true or false, studies of contested issues more often involve aspects that may not be possible to conclusively verify or falsify as a universal truth. Instead, one must rely on “scientific consensus” or “best available evidence” to identify which answers are to be viewed as correct (Flynn, 2016; Kuklinski et al., 2000). For these types of issues, it is always possible that new evidence will later confirm a belief that was previously defined as incorrect (Vraga & Bode, 2020).

While questions on textbook-like knowledge are more common in studies that aim at measuring the level of a public’s political knowledge (Barabas et al., 2014) and mostly absent in the literature on misperceptions, when looking at studies of knowledge on specific issue domains, the same formulations of survey questions appear repeatedly across the fields. Let us exemplify with some studies of issues of societal concern, that at some points have been subject to political controversy as well as misinformation: climate change, immigration, vaccines, the spread of contagious diseases, and genetically modified (GM) food. Within all of these topics, there are examples of similar survey items used across the fields, and where findings are interpreted differently depending on whether the study theoretically addresses knowledge or misperceptions. Examples of such survey items are presented in [Table 10.1](#).

How, then, can the uninformed be distinguished from the misinformed empirically on contested political issues? In the absence of direct survey questions that can be said to measure exclusively lack of knowledge or misperceptions, the existing literature dealing with these questions provides several suggestions of strategies for strengthening inferences regarding the incorrect responses. Below, we summarize those strategies and discuss their advantages and limitations.

Closed-Ended Versus Open-Ended Questions

Some scholars have proposed to use open-ended questions to identify the uninformed from other (correct and incorrect) responses. Luskin and Sood (2018) note that, because the provision of response categories makes guessing effortless,

Table 10.1 Examples of Survey Items Used Across Studies of Knowledge and Misperceptions

<i>Issue domain</i>	<i>Survey item</i>	<i>RQ “(lack of) knowledge”</i>	<i>RQ “misperceptions”</i>
Climate change	Failure to identify causes of global warming	Kahlor and Rosenthal (2009), Karpudewan et al. (2015)	Egan and Mullin (2012), Hmielowski et al. (2014)
Vaccines	Influenza vaccines can cause influenza	Zhang et al. (2011)	Daley et al. (2007)
The spread of HIV/AIDS	HIV/AIDS can be transmitted by shaking hands with an infected person	Okumu et al. (2017), Tapia-Aguirre et al. (2004)	Sallar (2009)
	Mainly certain groups (e.g. homosexuals) can contract HIV/AIDS	Tapia-Aguirre et al. (2004)	Essien et al. (2002)
Immigration	(Over)estimation of the share of a population with an immigrant background	Rapeli (2014)	Sides and Citrin (2007), Gorodzeisky and Semyonov (2020)
GMO	GM food is unsafe for human consumption	Wnuk and Kozak (2011)	Caple (2019)

close-ended questions are more prone to false positives than open-ended questions (also see Luskin & Bullock, 2011). Some guesses will be correct (falsely appearing as knowledge), while others will be incorrect (falsely appearing as misperceptions), leading to an overestimation of both informed and misinformed, and an underestimate of the uninformed. While these issues speak for the use of open-ended questions, such questions also have drawbacks. As opposed to the risk of false positives on closed-ended questions, open-ended questions are likely to generate more false negatives. Because open-ended questions are cognitively demanding, research shows that more people tend to withhold answering such questions (Bailey, 1987; Reja et al., 2003). Therefore, open-ended questions increase the risk of underestimating the number of informed and the number of misinformed, while overestimating the number of uninformed. In addition, the non-response on these questions may be systematically biased, as differences in response rates among individuals with different characteristics (e.g. politically interested versus non-interested) tend to be higher on cognitively burdensome questions (Holland & Christian, 2009; Reynolds et al., 2020).

Inclusion of “Don’t Know” (DK) Options

To offer don’t know options has also been proposed as a strategy for limiting the number of uninformed “unlucky guessers” on closed-ended questions (Luskin & Bullock, 2011). By providing respondents the opportunity to express their lack of knowledge without forcing them to withhold an answer, DK options

have the benefit of reducing the risk of overestimating the share of misinformed. However, this strategy also comes with trade-offs. While including a DK option may help reduce the risk of *overstating* the proportion of people who hold false or unsupported beliefs on closed-ended questions, it might also increase the risk of *understating* the proportion of the same (Flynn et al., 2017). It would, for instance, allow people who are misinformed to withhold stating their view, which should be of particular concern when the belief is controversial and subject to social discredit. On the contrary, it is also possible that some people will opt for guessing instead of a DK option even if they are uninformed, to satisfy the survey administrator and to not come across as politically ignorant (Baka et al., 2012; Sturgis et al., 2014).

Confidence Indicators

A strategy to single out the *misinformed*, which has become increasingly popular, is to ask questions about certainty after, or as a part of, the knowledge questions (Flynn, 2016; Damstra et al., 2021; Kuklinski et al., 2000; Pasek et al., 2015). In these cases, misinformed are defined as those who hold false beliefs and do so confidently, typically including participants who answer a question incorrectly and report that they are “very” or “extremely” certain about the answer. As a result, the uninformed in these studies include participants who answer incorrectly but with low or moderate certainty, skip the question, and/or choose a potential DK option (Pasek et al., 2015).

While confidence indeed can be seen as an indicator of false beliefs, this measure also has shortcomings. To begin with, some may indicate certainty for other reasons than holding firm beliefs. For example, some individuals may indicate confidence as a way of rationalizing their initial response (Rahn et al., 1994). In such cases, the fact that an individual chose to respond could lead them to conclude that they must be rather certain, as the most rational way of approaching the initial question otherwise would have been to withhold an answer or opt for “don’t know” (if available). It is also possible that people holding misperceptions will indicate lower levels of certainty not because they do not firmly believe in the wrong answer, but because they are aware that their beliefs are controversial, in turn making it uncomfortable to express certainty (Martin & Hewstone, 2003). Furthermore, it is possible that having people reflect on their beliefs again (by asking about their certainty) may temporarily increase their confidence. A series of experiments by Kelley and Lindsay (1993), for example, suggests that confidence in answers to knowledge questions may be inferred from the ease with which the answer comes to mind (also see Tversky & Kahneman, 1973). If this is the case, then people who are asked to express their certainty after having expressed a belief may experience more confidence because this belief is easily accessible at the moment – a concern that has been confirmed in related studies of attitude certainty (Holland et al., 2003). Another, more practical issue that has recently been noted is that confidence measures seem to perform rather poorly as predictors of response stability when the questions are followed up at

later points in time (Graham, 2021). Inferences about people having consistent and steadfast beliefs that are based on confidence indicators in a cross-sectional study alone thus risk being overstated.

Incentives to Answer Correctly

Another strategy for separating misinformed responses from other types of incorrect answers may be to offer monetary incentives for correct answers. Monetary rewards have been shown to increase the number of accurate responses and reduce partisan biases (Bullock et al., 2015; Prior et al., 2015), which suggests that sometimes, people may consciously choose to report answers that they do not believe to be true. Another interpretation is that when people are given incentives, they process the questions more in-depth and become more reluctant to use partisan and ideological cues as cognitive shortcuts, thereby reaching more accurate conclusions. However, as noted by Kuklinski et al. (2000), notwithstanding these plausible explanations, we still cannot know for sure that respondents are not holding misperceptions. For example, when incentives are offered, people may be more inclined to answer in a way they believe the researcher wants them to, rather than what they believe to be true. For example, they may assume that university-sponsored research perceives “caused by humans” as the correct answer to a question about the origins of climate change, given that news media often portray academics as advocates of anthropogenic explanations.

Corrective Information

The last strategy for assessing misperceptions that we have found is providing respondents who answer incorrectly with corrective information. If a person answers incorrectly because they lack knowledge, they can be expected to update their answer following the new information. False beliefs that are maintained by directionally motivated reasoning, on the other hand, are less likely to be corrected that easily (Taber & Lodge, 2006). When tested empirically, findings indicating that people are rather unsusceptible to corrections (Sides & Citrin, 2007), or that corrections can make people even more confident in their wrong beliefs (Nyhan & Reifler, 2010), are thus interpreted as evidence of misperceptions. Other studies, which show that rather minor corrective interventions can make people update their beliefs (Thorson, 2015), have been interpreted as indications that citizens are uninformed. While these are reasonable interpretations, the findings cannot be considered conclusive evidence of one or the other condition. For example, even those that *do* adjust their positions in response to new information may do so only temporarily and soon return to their original ones (Kuklinski et al., 2000), leading scholars to underestimate the share of misinformed.

Table 10.2 presents a summary of the strategies that have currently been proposed for differentiating the uninformed from those who hold misperceptions, including their advantages and limitations.

Table 10.2 Operational Strategies to Separate Misinformed From Uninformed in Surveys

<i>Design features</i>	<i>Advantages</i>	<i>Limitations</i>
Open-ended questions	Decreases “blind guessing”, and alleviates the risk of overstating the number of informed/misinformed, and understating the uninformed.	Lower response rates, which can lead to underestimation of the informed and misinformed, and overestimation of the uninformed. Also, involve a risk of systematic non-responses.
Inclusion of DK options	Reduces the risk of overstating the proportion of people who strongly hold false beliefs on closed-ended questions.	Increases the risk of understating the proportion of people who hold false beliefs, as misinformed may withhold stating a belief that is seen as controversial. On the contrary, some may opt for guessing rather than “confessing their ignorance” by stating don’t know.
Certainty indicators	Help distinguish those with consistent beliefs from “blind guessers”.	People may indicate certainty for other reasons than that they firmly believe in the answer, and has also been shown to serve as a fairly poor predictor of belief stability.
Incentives	Can reduce the number of wrong answers and partisan biases.	Responses may not reveal “true” beliefs, but rather what the respondents think that the survey administrator wants them to answer.
Corrective information	Incorrect answers due solely to a lack of knowledge should be reduced.	That someone adjusts their answers when “hit between the eyes” with facts does not mean that they have actually changed their beliefs, and they may soon return to their initial ones.

Summary: The Conceptual–Operational Gap

The above overview reveals that most limitations of existing empirical strategies to separating uninformed from misinformed relate to the fact that the question format makes it more easy/difficult to make a guess when lacking information, and/or that respondents may sometimes withhold answering, and sometimes provide an answer, even if a) they lack knowledge, or b) their answer deviates from their actual beliefs. These limitations reveal a gap between the theoretical interpretation of the outcomes of surveys as people being either informed (answer correctly), uninformed (indicates uncertainty), or misinformed (answer incorrectly), and the reasons for why people end up in the respective category. In fact, it seems like informed, uninformed, and misinformed all can end up in any of the three response categories, for different reasons. In Table 10.3, we illustrate this conceptual–operational gap. The first row presents the three response options on knowledge questions that are typically found in empirical knowledge surveys. The left column presents the three groups of individuals that we theoretically often aim to (and claim to) identify.

Table 10.3 Overview of the Conceptual–Operational Gap

<i>Survey response</i>	<i>Correct (and/or express certainty)</i>	<i>Don't know (and/or express uncertainty)</i>	<i>Incorrect (and/or express certainty)</i>
Informed	Possess factually correct information + have drawn correct inferences	Believe in the correct answer, but do not want to reveal this belief	Believe in the correct answer, but gives the wrong answer to express support for a political actor or view
Uninformed	Lucky guessers	Lack sufficient information and knowledge	Unlucky guessers
Misinformed	Believe in the wrong answer, but provide the correct answer to, for example, satisfy the survey administrator and/or comply with social norms	Believe in the wrong answer, but do not want to reveal this belief	Possess factually incorrect information or possess factually correct information but have drawn incorrect inferences

Note. Conceptual interpretations are in bold.

The text in bold presents the inferences we would draw from the outcomes of knowledge surveys based on this trichotomous conceptual definition of public knowledge (informed, uninformed, and misinformed); the remaining parts present the alternative reasons that may explain why an individual provide a specific response option.

Tailored Survey Designs for Different Research Questions: a Way Forward

In this section, we argue that to tackle the gap between the empirical outcomes of knowledge surveys and the conceptual distinction between the uninformed and misinformed, we must begin by acknowledging two things. First, we need to recognize the various reasons that people may have for choosing a specific response option already at the conceptual level. Second, we need to accept that there may be no universal solution or measure that can account for all of this potential variation at once. To move forward, instead, we should consider formulating more specific research questions that address selected aspects of knowledge, and tailor our study designs to those specific questions.

While some aspects of knowledge seem to be of central interest in much work on citizen knowledge – such as whether people possess the knowledge needed to make enlightened political choices, or not – there also seem to be distinctive differences in focus across studies. Some researchers, for example, may be most interested in finding general patterns in incorrect responses, separating individuals that hold consistently incorrect beliefs from those that answer correctly or incorrectly by chance. Others may be most concerned about identifying

individuals that truly and firmly believe in the wrong answer, and thus to reduce all types of systematic biases that can conflate this measure (such as compliance with social norms, or expressive responding). Further others may be particularly interested in questions of *why* some people hold misperceptions, and/or what makes those perceptions resistant to change. If we accept the variation that may prowl within different survey responses in empirical studies, and that we cannot address all this variation at once with one universal strategy, we may still be able to address the above questions separately with tailored designs. These are our suggestions.

Separating Individuals with Systematically Incorrect Beliefs from Individuals That are Correct or Incorrect by Chance: Repeated Measurements

If we are “only” interested in assessing levels of (lack of) systematic factual beliefs in public and leave aside the specific reasons for expressing certain beliefs consistently, repeated measurement designs should be a useful way forward. Based on the principle that the probability of making the same (un)lucky guess by chance decreases with repetition (Luskin & Bullock, 2011; Shapiro & Page, 1992), testing the same beliefs repeatedly should identify the uninformed via random changes across measurements, and the misinformed by systematic (in) stability across the same.

PANEL STUDIES

A first way to separate the “blind guessers” from those who hold consistent (correct as well as incorrect) beliefs would thus be to repeat *the same survey questions* over time. If people hold consistent beliefs on an issue, they should provide the same response repeatedly, whereas responses from uninformed are likely to vary more randomly across measure points. Since reality sometimes changes – and thereby what information can be considered correct or not (Vraga & Bode, 2020) – two potential outcomes are possible. If the situation is stable, then people who are informed (hold beliefs that are updated based on the best available evidence) will provide the same (correct) answer across measure points, whereas people holding misperceptions will give the same (incorrect) answer repeatedly. The uninformed, on their side, can be expected to answer more randomly in both directions. If reality changes during the period of measurements, on the other hand, then another pattern should emerge. In such cases, people who are informed should update their answers according to the changes in reality and available evidence, whereas those holding misperceptions will be less likely to do so. The uninformed, again, should answer less systematically and in more random directions. With a panel study with repeated measures over time, those holding misperceptions can thus be separated from the informed (that will be correct regardless of the situation)

in that whether their answers are correct or not will be conditioned by reality, and from the uninformed, in the sense that those will be correct or not due to chance (irrespective of the current situation).

(IN)STABILITY ACROSS ITEMS WITHIN SPECIFIC ISSUE DOMAINS

Another way of utilizing repetition to separate the uninformed from those holding consistent misperceptions is to study (in)consistencies in responses to a series of questions measuring the same underlying belief dimension. If people are guessing, answers to different items on the issue should not follow any specific logic, whereas if a person holds misperceptions on the issue, whether the answers will be correct or not will depend on their underlying beliefs. If, for example, a person believes that society is becoming more crime-ridden, then this person can be expected to answer consistently in ways that support this perception. In contrast, a person who lacks knowledge and has no underlying beliefs pointing in one direction or another can be expected to answer more randomly.

To assess the proportion of uninformed and misinformed individuals on a specific issue, several questions measuring issue-related beliefs could thus be posed, which include variation both in terms of what perception is supported, and in terms of what answer is correct or not. For example, on knowledge about crime, some questions can be formulated to *incorrectly* support a perception that society is becoming more crime-ridden (e.g. the number of homicides has increased in the past years) whereas other questions could be formulated to *correctly* support the same view (e.g. the share of homicides by gun violence has increased the past years). Instead of looking at each item separately, or constructing an issue-specific knowledge index, one could investigate the correlations between the different combinations. If knowledge is widespread – most people know the right answer – then correlations will be strong, and these will be decided by whether the statements are correct or not. If misperceptions are widespread, there will be correlations across items, but these will be decided by whether or not it supports a certain view (e.g. that society is becoming more crime-ridden) rather than whether the statements are correct or not. If correlations are weak or non-existing, then one can conclude that a larger share of the incorrect responses is likely due to a lack of knowledge and beliefs.

While repeated measurement designs can help differentiate groups of uninformed individuals from consistently incorrect people, we cannot, based on these designs, empirically conclude that people that systematically answer incorrectly truly believe in the wrong answer. Probability assessments alone cannot rule out the possibility that some people that hold false beliefs, for social pressure or other reasons, may either withhold an answer or choose to answer in ways that deviate from their actual beliefs. Neither can we rule out that people who *do not* hold specific beliefs on an issue still answer wrongly in certain directions (some may for example tend to answer negatively rather than positively on issues on which they lack knowledge and beliefs).

Identifying the Individuals That Truly Believe in the Wrong Answer: Unobtrusive Measurements

If we are interested in identifying the individuals that truly believe in an inaccurate answer, we may want to use designs that are specifically tailored to reduce dishonest responses that may arise from different social motivations. If a concern is that a knowledge question is sensitive in nature and thus may prevent some people from revealing their true beliefs, one should consider less obtrusive ways of measuring such beliefs. For example, in a study that aims to identify individuals that firmly believe that vaccines are harmful, some items could be formulated in a way that is unmistakably against the best available scientific evidence, such as “influenza vaccines infect people with influenza”, whereas others could be formulated less obtrusively while still measuring the same underlying perception, such as “for most diseases, immunity can be achieved by much less invasive treatments than vaccines”. Individuals that provide systematic responses supporting a belief that vaccines are generally harmful can then be more safely inferred to hold misperceptions, even when they express less confidence in their response to the obtrusive questions.

Another strategy for reducing the number of dishonest answers is to utilize item count designs (so-called list experiments). With list experiments, respondents can express their views without revealing their responses directly to the survey administrator, by indicating how many of a list of statements they agree with rather than expressing their belief on each specific statement. This design will not allow for differentiating specific types of dishonest responding, such as expressive responding or compliance, as list experiments are expected to reduce both these types of biases (Flynn et al., 2017). If the aim is to reduce all sorts of biases (irrespective of type) to come closer to people’s real beliefs, however, it should be a worthwhile strategy to consider.

While using unobtrusive measurements like list experiments and reformulations of potentially provocative questions should be useful to single out the individuals that are “truly” misinformed, the design does not tell us *why* these people believe in the wrong answer. Some individuals may, for example, have been directly misled by false information. Others may have encountered accurate information but been unable or unwilling to draw correct inferences based on this information.

Assessing Why Some Individuals Believe in the Wrong Answer: Multivariate Analyses With Predictor Variables

If our aim is to understand what causes people to hold misperceptions on social issues, we need designs that can identify the factors that predict responding incorrectly. In our review of the conceptual distinctions between uninformed and misinformed, we discussed a number of such factors. On the contextual level, people may have received incorrect information and therefore possess wrong knowledge. They may also have received *correct* information, but drawn

incorrect inferences. These inferences, in turn, may be spurred by different individual-level factors. Some individuals may lack the cognitive abilities to process the information in a sound way, which in turn may be due to for example prior knowledge and education. Others may possess the cognitive abilities, but have directional motivations that prevent them from reaching accurate conclusions. Those motivations may, for example, be to avoid cognitive dissonance and to confirm existing beliefs and attitudes, ideological positions, or to protect strongly invested interests and identities. To investigate what factors there are that cause people to become misinformed, we need to perform multivariate analyses of the associations between incorrect responses and relevant background factors, with designs that allow for causal inferences. Such analyses could be enabled by panel-survey data measuring beliefs and predictor variables at several time-points, but they could also be enabled with experimental designs where different predictors are experimentally induced (e.g. by exposing different individuals to correct and incorrect factual information, or by prompting ideological and partisan identities for some individuals and not for others).

Assessing Knowledge Resistance: Accuracy Interventions with Follow-up Studies

In our review, we identified several strategies that have been used to investigate citizens' possibilities to adjust misbeliefs and acquire correct knowledge. Those strategies include providing survey participants with correct information, and/or with incentives to process knowledge questions with accuracy goals. While these studies seem viable, we found that most of them thus far have been done at a single measure-point. Hence, it has not been possible to rule out that people have changed their responses for other reasons than that they actually updated their beliefs. To evaluate the extent to which these types of interventions really help raise the public's knowledge, we emphasize again the utility of panel surveys. If people persist in responding correctly to a survey question after the intervention is no longer present, it would be safer to say that they have updated their beliefs and acquired knowledge. If they return to their initial response in a follow-up study, however, it seems more likely that they adjusted their answer temporarily to satisfy the survey administrator and yet resisted knowledge and available evidence.

Concluding Discussion

This chapter picks up on a growing trend in research on political knowledge that recognizes a dissonance between how uninformed people (people that lack knowledge and beliefs) and misinformed (people that possess beliefs that are not compatible with the best available evidence) are differentiated on the conceptual level, and how they can be distinguished empirically. The dissonance stems from the fact that while in theory, those that provide a substantive answer to a knowledge question may be likely to hold a substantive belief, empirically, people may

respond both correctly and incorrectly for other reasons than that they truly believe in this answer. Some may give an answer to express sympathy with a political actor, others to comply with social norms, and further others may just be “lucky” or “unlucky” guessers. This has led to a concern that what many studies now refer to as misperceptions (or misinformed beliefs) can be severally overstated or understated, depending on the underlying reasons respondents had for providing their answers.

Existing research has suggested important, yet imperfect methods that may help to address some of the conceptual–operational dissonance, including the use of don’t know options, confidence indicators, open-ended answers, incentives, and correctional interventions. However, all these methods still seem to suffer from different non-trivial limitations. To help remedy this situation, this chapter has provided an overview of available operational strategies for distinguishing (lack of) knowledge from (mis)perceptions that have previously appeared rather scattered in the literature and discussed the benefits and limitations of each strategy. Second, it has outlined alternative directions for addressing the conceptual–operational gap in the future. To tackle the gap between the empirical and conceptual definitions of misperceptions, we argue, we first need to acknowledge – already on the conceptual level – the different reasons that individuals may have for responding incorrectly to knowledge questions. Second, on the empirical level, we may have to accept that no individual study may be able to address all variations in the public’s knowledge at once. Instead, we may have to start asking more specific research questions, addressing selected aspects of the variation in responses to knowledge questions that people may have with study-specific tailored designs.

Concludingly, we argue, researchers should be cautious about drawing inferences about incorrect answers to knowledge questions based solely on the trichotomous conceptual distinction between informed, uninformed, and misinformed. When drawing conclusions about people’s knowledge and beliefs from empirical surveys, the possible heterogeneity in survey responses must be recognized alongside theoretical expectations, and inferences must be restricted to what can reliably be addressed by a specifically chosen survey design.

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11 Striving for Certainty

Epistemic Motivations and (Un)Biased Cognition

*Małgorzata Kossowska, Gabriela Czarnek,
Ewa Szumowska and Paulina Szwed*

Introduction

In this chapter, we will focus on how the quest for certainty drives cognition and thereby affects knowledge formation and usage. Traditionally, this quest has been linked to closed-minded cognition, that is, to forming rigid knowledge and belief systems resistant to change (Kruglanski, 1989). Closed-mindedness leads people to believe they are in possession of an absolute truth, which is why they uncritically ignore, discount, or reject evidence that is discrepant with their important beliefs (usually linked to identity). This usually drives inaccurate and biased cognition and implies a tendency to maintain in one's mind a single perspective along with the conviction of its unquestionable correctness, which results in the rejection of other perspectives. This also leads to knowledge resistance, that is, a failure to accept available and established knowledge.

The motivation to achieve certainty is however not always associated with closed-minded (and biased) cognition, and in this chapter, we will put forward an alternative view to account for this. More specifically, we claim that the quest for certainty is a goal that can be attained by various means. They may be chosen from among a range of means, either biased, identity-protective, or accuracy-oriented cognitive strategies, depending on how useful (i.e. instrumental) these means are perceived to be for the overarching goal of epistemic certainty. Epistemic certainty about the past and present state of the world refers to what we know. Epistemic uncertainty however arises because of what we do not know but could know in theory (e.g. uncertainty due to limitations of the sample or methodology) (van der Bles et al., 2019). When identity-protective strategies are adopted, the beliefs that a person holds remain unchanged, or even strengthened due to rejection of claims with good evidence against one's view or endorsements of claims with no credible evidence that support ones' beliefs/identity. However, when accuracy-oriented strategies are adopted, existing beliefs may be altered by the incoming information. This implies the capacity to retain diverse perspectives in one's mind, to accept their diversity and their critical overview. In consequence, it becomes possible to change one's beliefs and judgements whenever new and more credible information is revealed.

Cognition is Motivated¹

The construction of new knowledge is a persistent human activity. For activities ranging from the relatively simple and mundane to the highly complex, new knowledge is essential to assure confident decisions and reasoned actions. Given the prevalence of the knowledge formation process, and its essential psychological relevance to human thoughts, feelings, and actions, understanding how knowledge is formed and changed, is a task of considerable importance for psychological science (Kruglanski, 2004). According to Lay epistemic theory (Kruglanski, 1989), contrary to popular belief, individuals do not gather information in a chaotic and random manner. Research has rather shown that knowledge formation is a process of hypothesis generation and validation, which is quite orderly and follows logical rules, such as “if – then”, from premise to conclusion (Kruglanski et al., 2009). The conclusion is knowledge, an opinion, a belief, or a judgement. This process occurs regardless of the quality of the information acquired (evidence may be reliable or unreliable). It also occurs regardless the engagement of the person involved (one may wish to know what the truth is, or simply to confirm their initial expectations). It emerges in each case when an individual learns of something that is sufficiently important to initiate the motivational process that underlies cognition.

Kruglanski et al. (2009) demonstrate that the manner in which people generate hypotheses is reliant on cognitive resources. These may be modified by exhaustion and by people’s readiness to engage in cognitive activity. The more cognitive resources available, the more alternative hypotheses could be generated. However, cognitive exhaustion (e.g. several activities are being conducted at once, too much similar information is being given, or even information chaos is present) or high epistemic motivation (i.e. the desire to develop and maintain a rich and thorough understanding of a situation) usually limit the scope of the hypothesis generation process. As a result, people tend to bring up a low number of hypotheses about the event.

However, the process of hypothesis validation depends on prior knowledge and its level of activation, plus the quality and strength of evidence available. These factors work together in shaping the processes of selection and evaluation of information, and in effect, the adoption or rejection of a hypothesis, and thus the formation of knowledge. A further factor that plays a crucial role here is epistemic motivation. This factor affects the degree of confidence in one’s knowledge and influences the propensity to continue or stop searching for information. It also impacts decisions concerning which information can be considered “evidence”. It shapes readiness to update one’s beliefs in the light of emerging new evidence (Kruglanski et al., 2009). This epistemic process may manifest in knowledge resistance or openness to its update based on credible evidence.

Epistemic motivation is usually initiated under uncertainty, i.e. when there is a lack of information (or there is access to merely low-quality, incomplete or conflicting information) about whether, where, when, how, or why an event has

occurred, or will occur (Knight, 1921). Uncertainty could be reduced by means of the acquisition of precise, unambiguous knowledge of the specific content of one's beliefs and preferences (or regardless of their specificity). Thus, this type of motivation influences different epistemic behaviors, including the active search for information that is subjectively considered relevant and valid. Such information could serve as "evidence". The behaviors initiated under epistemic motivation can also encompass the active avoidance of information subjectively considered nonrelevant or nonvalid. In addition, epistemic motivation itself can generally be classified into two kinds: the need for nonspecific certainty, and the need for specific certainty (Kruglanski, 1989). Whereas the former reflects the need to possess any certain answer on a topic (e.g. whether vaccination against Covid-19 is safe and effective), the latter refers to the need to attain a concrete judgement, opinion, and/or assessment (e.g. that the vaccination against Covid-19 is indeed safe and effective). The need for specific certainty has an influence on cognition which has often been interpreted as a directional bias toward a favored conclusion (e.g. anti-vaccination advocates can interpret the side effects of vaccine as proof that they were right). Much classic motivational work in attribution (e.g. Miller, 1976) as well as cognitive dissonance (Cooper & Fazio, 1984) has been the focus of this particular motive.

Moreover, the primary assumption of a great deal of traditional work on motivated reasoning is that the whole process of knowledge formation is motivated by prior beliefs (Kunda, 1990). It has been suggested that people form their current beliefs based both on prior beliefs and the cogency of the new relevant evidence (Kruglanski et al., 2020). In this view, prior beliefs serve as (internal) models of (external) reality, and are used to make predictions about the world. However, any actions or perceptions are subject to optimization, and the explanations accounting for the new evidence need to be accurate as possible. Consequently, there are two ways of accounting for the new evidence: (1) updating one's model or (2) acting on and sampling evidence so that it fits with the model (Kruglanski et al., 2020). Taking the first of these paths, people construct mental models that enable them to predict and interpret subsequent experiences. It also provides them with a sense of understanding, even meaning (Proulx, Inzlicht, & Harmon-Jones 2012). Once adopted, people are committed to the models, but may also change them. This process is defined as a change of expectations toward new stimuli that renders them consistent with what was already known. In turn, the second process involved is one of accounting for new evidence which entails people tending to search for, interpret, favor and recall information in such a way as to confirm their preexisting beliefs or hypotheses (Nickerson, 1998). In this way, people may start out overconfident in an initial belief, fail to give proper consideration to alternative hypotheses, or interpret ambiguous information in favor of a firmly held belief (Klayman, 1995).

We now turn to the second class of epistemic motivation, the need for nonspecific certainty which reflects the need to arrive at any conclusion whatsoever that would serve the focal goal to achieve certainty (Kruglanski, 1989). In other words, the need for nonspecific certainty drives the possession of any opinion,

judgement, beliefs, regardless of their content. This knowledge needs to provide a sense of certainty, adequacy, and be subjectively sufficient to understand a given phenomenon. This type of epistemic motivation boils down to such things as (1) reducing the scope of information processing and hypothesis generation, (2) concentrating the process of seeking information on prototypical rather than diagnostic parameters, and (3) using the first available information. All these lead to the tendency to focus on evidence or facts that are presented earlier than others (*primacy effect*), and then to determine the other information from it (*anchoring*), as well as the activation of stereotypical content, and a preference for consensual and general knowledge (for an overview, see Roets et al., 2015).

According to Kruglanski et al. (2020), by taking into account the need for specific or non-specific certainty, we are in a position to explicate diverse epistemic phenomena, such as seeking, avoiding, biasing new information, and revising and updating, or protecting, one's beliefs when confronted with new evidence. These processes are crucial to understanding knowledge formation and its usage.

Cognitive Effects of the Need for Specific Certainty

One of the most documented effects of the need for certainty are confirmation or myside bias and disconfirmation bias (for an overview, see Nickerson, 1998). The first phenomenon occurs when people accept evidence confirming their (important) beliefs without criticism, whereas the latter occurs when people try to undermine the evidence contrary to their beliefs. It follows that one type of evidence that might be perceived as supporting one's stances is mixed findings. In a classic study, Lord et al. (1979) found that people were more skeptical toward research that presented conclusions which were inconsistent with their beliefs (about the efficacy of the death penalty as a deterrent to murder). Specifically, people perceived the studies presented as more reliable and convincing, when the results therein were in support of their own stance on the topic compared to those that were not. Intriguingly, the study methods themselves were presented to participants after the procedures were completed. The authors called this process *biased assimilation*. They concluded that, as a result of this process, when people are provided mixed, inconclusive, or random evidence, *biased assimilation* leads to a further polarization of opinions. Similarly, in a study by Ditto and Lopez (1992; Studies 2–3), when people were presented with the undesirable (vs. desirable) results of a medical test, it took them longer to decide whether their test result was complete, they were more likely to retest the validity of their result, and rated test accuracy lower. This indicates that people were less skeptical of evidence that was provided to them with desirable vs. undesirable information. Another study looking at the effects of mixed evidence was that of Bastardi et al. (2011), who analyzed responses to scientific evidence from would-be parents who deemed home care to be superior to day care with regards to a child's future prospects. They compared two groups: *conflicted parents* (who were planning to use day care, although convinced that home care is superior)

and *unconflicted* ones (who were planning to use home care only). Participants were presented with two studies with different research designs (either randomly assigned, or statistically matching the sample) showing evidence for the superiority of one form of childcare or the other. The parents' evaluation of the studies' methodology favored the study that supported their desire (day care for the *conflicted*; home care for the *non-conflicted*) but the effects were stronger for the conflicted group. Also, people in the *conflicted* group changed their beliefs about day care dramatically on being provided with the (mixed) evidence. Those in the *non-conflicted* group changed their opinion only slightly. The authors concluded that "evaluations of purported scientific evidence were shaped more by what participants desired to be true than by what they had initially believed to be true" (p. 732).

These findings illustrate how prior beliefs influence knowledge formation. However, not all beliefs are valued to the same extent. Hence, not all beliefs exercise the same power to drive cognition. The sorts of beliefs that especially influence the way people search for and process information are those that are directly linked to their identity, both personal and social. Indeed, there is mounting evidence to suggest that identity-relevant beliefs are more than just tools to achieve external goals. Rather, these beliefs are a source of value in and of themselves, such that people are motivated to hold particular beliefs. For example, people generally prefer to believe they are correct rather than incorrect, they prefer to believe the future is bright rather than dark, and they prefer to hold beliefs with certainty rather than uncertainty. The researchers propose that the more identity-relevant a perception of behavior, the more likely functional these beliefs are, thus, the more successful self-regulation will occur. It is worth highlighting here that there is an overlap of brain regions involved in self-related and reward processing, which is in line with a suggestion that behavior or information that is self- or identity-relevant would have high subjective value (Berkman et al., 2017).

A vast body of research has demonstrated that beliefs related to social identity hold greater subjective value than beliefs irrelevant to this identity (Ellemers et al., 2002). This stems from findings that while personal identity informs the beliefs that are important to oneself (for instance, related to being tall, belief in one's proficiency in foreign languages or intelligence), social identity refers to a person's knowledge pertaining to their belonging to a social category or group (Hogg & Abrams, 1988). The social categorization of self and others generates a sense of in-group identification and belonging. It regulates perception, inference, feelings, behavior, and interaction to conform to the best representation of a given category (to prototype-based knowledge) one possesses about one's own group, and relevant outgroups. Moreover, because group prototypes and representation are shared ("we" are like this, "they" are like that), one's world view and self-concept are consensually validated by the overt and verbal behavior of fellow group members. Social categorization thus makes one's own and others' behavior predictable, and allows one to avoid harm, plan effective action, and know how one should feel and behave. Thus, under uncertainty,

being motivated by the specific need for certainty, people become more involved in identity defensive cognitions (e.g. the right-wing adherents tend to be stricter and surer about abortion ban when uncertainty is present). This is especially the case when taking into consideration evidence that is suffused with culturally divisive meanings. In these circumstances, the pressure to adhere to group-congruent beliefs will often dominate over ‘the right answer’ standpoint (Kahan, 2017). Thus, espousing and holding beliefs that are aligned with one’s social identity is a higher priority than achieving accuracy. The latter is too inconsequential a motive to affect the level of risk that a person faces, or to determine the outcome of any public debate. However, the consequences of getting the ‘wrong answer’ in terms of what is expected by members of the affinity group, are much more serious for the person, ranging from a loss of trust among peers to stigmatization within their community. Indeed, Kahan (2017) claims that social incentives for holding and expressing beliefs that are congenial to ones’ group are almost invariably of higher value than producing accurate responses in most instances.

Still, it is worth noting that uncertainty itself, and various sorts of threats posed to one’s identity, make the protection of identity-relevant beliefs stronger. An interesting example comes from a study by Rothmund et al. (2015), showing that when an important value is put in jeopardy (e.g. by informing pacifists about real-life violence), people are more likely to believe in scientific and political claims regarding any further threat to this value (e.g. that violent games are harmful). Colombo et al. (2016) looked into the role of morality in the perception of scientific hypotheses. They found that when a scientific hypothesis is offensive to one’s moral values (e.g. hypotheses that attending religious services makes people healthier could be offensive to those who are dogmatic atheist, or that growing up with non-heteronormative parents lead to developmental disorders – to members of LGBT+ communities), then the assessment of the hypothesis is biased. Of interest is the fact that providing incentives (money) for more accurate evaluations did not improve subjects’ accuracy, and these effects held even after controlling for the prior credibility of the hypothesis (e.g. when informed that the scientific community meets the scientific consensus about given hypothesis). Furthermore, Washburn and Skitka (2018) asked participants to interpret the results of the scientific evaluations of a public policy (e.g. CO₂ vehicle emission standards) and its conclusion. Although participants were informed about the correct interpretation afterwards, their ratings of agreement with these interpretations, the perception of being knowledgeable, and trust in the research’s interpretation depended on their own political ideology. Significantly, both liberals and conservatives were not in agreement with interpretations of the scientific findings that contradicted their own beliefs. Also, Kossowska et al. (2017), studying religious orthodoxy, demonstrated that the threat posed by value-violators (e.g. atheists) leads to negative attitudes toward these groups among highly religious people. In this case, experienced threat for the outgroup was operationalized by cardiovascular reactivity, i.e. heart rate (HR); the higher the HR index, the higher the threat. The results found that people who hold high (vs. low)

levels of orthodox belief responded with increased HR after they were exposed to atheistic worldviews. However, the authors observed decreased HR after the expression of prejudice toward atheists among highly orthodox participants compared to the control condition. They did not find this effect among people holding low levels of orthodox belief. Thus, the researchers revealed that prejudice, in fact, may serve as an efficient strategy to protect oneself from sources of threat. This reasoning is consistent with research suggesting that prejudice and discrimination directed toward members of groups that violate important values, norms, and traditions can be used to diminish (or resist) these groups' informational influence on the person. This further bolsters one's cultural worldview, and thus reduces threat levels (for an overview, see Burke et al., 2010). In a similar vein, across three studies, Kossowska et al. (2020) showed that ideology is linked to the misperception of politically sensitive facts (e.g. What percentage of all people who died in Auschwitz were Jews? or What percentage of Polish society are LGBT?). This was especially true under conditions conducive to a higher salience of political identity (i.e. during the outbreak of the Covid-19 pandemic). The researchers explain this effect by positing that politically-relevant facts, especially highly politicized facts which are associated with membership in a political group, trigger the goal of protecting one's identity. As with other social-identity processes, ideology powerfully motivates perceptual processes toward making assessments in line with beliefs held by one's group (and resisting, i.e. ignoring or discounting, information in opposition to the beliefs held by the group). Other researchers also claim that shared ideological commitments intertwined with membership in groups furnish these individuals with important forms of support – emotional and psychological as well as material (e.g. Green et al., 2002). If a proposition about some policy-relevant fact comes to be commonly associated with membership in such a group, the prospect that one might form a contrary position can threaten one's standing within the group. Thus, these individuals may be motivated to resist empirical assertions (e.g. that gun control reduces or does or does not reduce crime), if they run contrary to the dominant belief within their groups. Thus, individuals may display the facts as negligible in their impact provided that the assessments (however wrong) are in line with their group commitments. Of note is the finding that the effects of identity on information processing are observed under uncertainty conditions which are conducive to a higher salience of political identity. Uncertainty may lead individuals to display a strong tendency to conform their understanding of different issues, especially complex ones, in accordance with the position of the authorities, or groups that they support or belong to (e.g. Kahan, 2017). This stems from the fact that uncertainty (threat, anxiety, and related negative feelings) causes ideological identity to become more salient, and in that fashion, identity-related beliefs shape social perception. Erroneousness that individuals may display regarding the facts is seen as negligible in its impact provided that the assessments (however wrong) are in line with their group commitments. Of note is the finding that the effects of identity on information processing are observed under uncertainty conditions which are conducive to a higher

salience of political identity. Uncertainty may lead individuals to display a strong tendency to confirm their understanding of different issues, especially complex ones, in accordance with the position of the authorities, or groups that they support or belong to (e.g. Kahan, 2017). This stems from the fact that uncertainty (threat, anxiety, and related negative feelings) causes ideological identity to become more salient, and in that fashion, identity-related beliefs shape social perception.

Although most of the studies demonstrated the negative effects of identity protective cognitions on accurate perception, judgments, and attitudes, it should be pointed out that there is some evidence showing that, under certain conditions, identity bias can be reduced or even overcome. For example, prompting an accuracy goal to reach a correct conclusion can elicit greater cognitive effort toward that goal, which can be translated into accurate cognition (e.g. Baumeister & Newman, 1994). Other studies show that identity-biased cognition is reduced when people are asked to form accurate opinions about a policy (Bolsen et al., 2014). Also, curiosity toward science was shown to reduce partisan polarization around science. Hence, people with high levels of curiosity about science were willing to consume news that was not in line with their political identity (Kahan, 2017). Similarly, helping people to realize their own ignorance about policy details – known as the explanatory depth illusion – can reduce political polarization; by contrast, derogating your political opponents tends to increase polarization (Fernbach et al., 2013; Suhay et al., 2018). Finally, Porter and Schumann (2018), investigating intellectual humility (i.e. recognizing the limits of one's knowledge and appreciating others' intellectual strengths), experimentally demonstrated that this factor could contribute to disagreements becoming more constructive. Specifically, it turned out that making salient a growth mindset of intelligence (i.e. by asserting that intelligence can be developed) boosted intellectual humility and in turn, openness to opposing views.

Cognitive Effects of the Need for Non-specific Certainty

The need for non-specific certainty implies the search for a firm, precise answer to a question, regardless of its specific content. Thus, under this motivation one just wants to know, rather than confirm a specific belief. Many studies have demonstrated that the motivation to attain certainty can psychologically manifest in the vigilance used to detect threats and opportunities. It also unfolds in impulsive reactions, wherein a person responds rapidly, with little deliberation (e.g. one makes a decision based on scarce, readily available information instead of engaging in a more extensive search). It also manifested in the capture of any immediate benefits, even when greater benefits could be obtained later (Jonas et al., 2014). This gives rise to a number of cognitive, motivational, and behavioral implications, including risk aversion, attentional biases, and impaired performance on a variety of working memory and decision-making tasks (e.g. Jameson et al., 2004). It also leads to narrow, selective attention focused on threatening stimuli that, under many circumstances, results in suboptimal performance

(Easterbrook, 1959; Kossowska, 2007). For example, a sizeable majority of previous studies have demonstrated that motivation to reduce uncertainty promotes simplistic cognition relying mainly on stereotypes and heuristics, that is, simple rules that lead to fast, yet at times suboptimal decisions (Kruglanski, 2004). Some studies have shown that people who are highly motivated to reduce uncertainty make more stereotypical judgments, prefer homogeneous over diverse groups, prefer consistent over inconsistent images, prefer realistic over abstract art, and prefer normative over deviant stimuli. Moreover, this motivation is related to heightened resistance to altering conclusions once drawn and greater reliance on the default mode of decision-making (for a review, see Roets et al., 2015). To conclude, under motivation to non-specific certainty, knowledge systems became rigid, closed to new evidence, resistant to change, and biased in the face of fragmented information.

While research clearly demonstrates the link between uncertainty and simplistic cognition, leading to biases and neglect of a large portion of important evidence, there are some contradictory findings, revealing that this motivation may also drive people to complex, effortful, and unbiased cognitions. For example, there is substantial evidence that people attend to novel, unexpected events that might disconfirm their expectancies but only when these events are relevant to their goals (e.g. when individuals desire to understand the event and be accurate in their cognition). Other studies have also shown that disconfirmations of important expectancies lead to increased attention to and processing of the inconsistent information. Additionally, people are willing to consider and incorporate new information in order to improve their predictive ability. This motivation can also foster an exploratory mode in which people tend to be open to, seek, and incorporate new information so as to be accurate or to avoid mistakes. These effects are reviewed by Kossowska et al. (2018).

A Goal (Versus Means) Perspective on the Quest for Certainty

So far, we have outlined the cognitive effects of the quest for certainty (specific or non-specific) that can be usually described as limiting openness for new evidence and thus biasing cognition. However, we have mentioned that this epistemic motivation, may also lead to more open-minded and unbiased cognition (i.e. all evidence is processed, regardless of their consistency with one's views). This dichotomy presents us with the challenge of distinguishing the conditions under which the quest for certainty leads to open-minded and when to simplistic, bias-prone cognition. Given the seeming necessity for theoretical refinement in this area, we have proposed a framework that allows for the re-examination of the abovementioned findings.

Specifically, we take a goal-means perspective and differentiate between the cognitive goals and means (i.e. actions) undertaken to satisfy these goals (Kruglanski et al., 2002). Goals represent *desirable states of affairs* to which attainment one is personally committed, and means are instrumental actions serving attainment of one's goals. We posit that the need for certainty (whether

specific or non-specific) is no different from any other goal. In this case, people aim to achieve certainty, they seek an answer to an important question, they desire to uphold a certain belief, and/or they wish to make confident decisions. These motivational states may initiate various epistemic actions to fulfill these underlying motives. For instance, people may consult other people's opinions to obtain external validation of their views, or they may simply depend on their own epistemic authority to form a confident judgment (Kossowska et al., 2018). Moreover, they may thoroughly scrutinize the attributes of all the available alternatives before making a decision, or they may be satisfied with choosing the first option that passes their personal threshold (Schwartz, 2004). While people will sometimes act skeptically and seek out information that contradicts their own knowledge, in other cases, they will actively avoid information if that helps them to protect a valued belief (Golman et al., 2017). Lastly, while they are sometimes ready to reach accurate conclusions, very often they form biased but identity-protective judgements (Kahan, 2017).

The above shows that even when the goal stays the same, (one wants to attain certainty (either specific or non-specific)), the means (cognitive strategies) can differ and, on some occasions, people select "closed-minded" means whereas, at other times, they opt for "open-minded" ones. And it is the distinction at the level of means, rather than goals, that determines whether people will resist the new or contradictory facts or let them influence their belief systems. This proposition has important theoretical and practical implications, as it allows for identifying conditions under which certainty-seeking individuals – otherwise prone to knowledge resistance – are more open to processing belief-inconsistent facts.

To this end, Kossowska et al. (2018) proposed that processing strategies, or means, are chosen according to their perceived instrumentality in accomplishing a particular goal, and their relations with other means and goals (Kruglanski et al., 2002). Instrumental means are ones that afford high probability (expectancy) of attaining a given goal with them (e.g. studying is an instrumental means to the goal of passing an exam, whereas partying is not) (Bélanger et al., 2016). In addition, a means is less likely to be chosen if it can be substituted by other means (i.e. equifinality), and is more likely to be selected if it serves additional coactivated goals (i.e. multifinality). A parallel line of research, in the cognitive neuroscience of motivation (e.g. Berridge et al. (2009)), found that goal-directed behavior is associated with neuro-psychological states linked to wanting and seeking, and the activation of areas of the brain associated with reward processing (e.g. the cortico-basal ganglia-thalamic loop), as well as sympathetic nervous system reactivity (Gendolla et al., 2019). Together, these functions optimize goal striving and effort.

Following this thread of reasoning, Kossowska et al. (2018) proposed a model that allows clear predictions to be made about when and why people, epistemically motivated to reduce (non-specific) uncertainty, tend to perceive open-minded cognitive strategies as more instrumental than closed-minded strategies for reaching their goal of certainty. Specifically, the researchers suggested that this may happen when: (a) cues present in a situation suggest that open-minded

means are more useful for attaining the goal, (b) the closed-minded means are unknown or unavailable, or (c) general trust in closed-minded options is undermined. In an extensive research program, the researchers found support for these assumptions. For example, Jaśko et al. (2015) investigating decision-making processes, demonstrated that people motivated to achieve certainty searched for more information (i.e. they open more boxes with relevant information) before they made a decision and spent more time on decision-making than did those not in search of certainty, which attests to their openness to new information. What is more, it turned out that when a clue appeared in the task informing the participant of techniques conducive to its completion, people needing certainty followed it more frequently than those low in this need. In particular, when there was a clear rule by which seeking a greater amount of information turned out to be more beneficial in terms of goal achievement (i.e. participants were told that the majority of people open most boxes to attain high results), people highly motivated to achieve certainty engaged in information-seeking to a greater degree. These findings have important implications for understanding how certainty-seeking individuals process information more generally. Specifically, it suggests that they can be more open or closed (i.e. resistant) to new facts, depending on the situation. When, in a given context, there is a clue suggesting that certainty could be best attained when engaging in unbiased, more extensive information search (e.g. nudges prompting fact-checking or verifying information with different sources), people motivated to attain certainty will exhibit more “open” epistemic behaviors, even when this may lead to a change in their initial view.

A further example of a condition inducing open-minded cognition among people epistemically motivated to achieve certainty comes from the classic study by Kruglanski et al. (1991). The experiment they conducted showed that when the initial certainty of participants as to their decisions was high, the need for certainty was indeed associated with a lower amount of information being sought by the participants. However, when participants were not certain as to their initial decision, this epistemic motivation expanded the scope of data sought out.

An illustration of cognition occurring under conditions where general trust in closed-minded options is undermined comes from studies by Kossowska & Bar-Tal (2013). In this study, the researchers demonstrated that low trust in one’s own capacity to achieve certainty may lead to cognition that is typically associated with openness, such as reduced bias in the formulation of impressions of others, the taking of complex decisions rather than simple ones, and reduced stereotyping. In addition, studies in which one’s confidence in the previously obtained knowledge was experimentally undermined, these open-minded effects were also found (Dragon & Kossowska, 2019). In these situations, individuals lost faith in themselves and their knowledge, which, in turn, resulted in this knowledge (i.e. opinions, beliefs, stereotypes) no longer serving as the basis for formulating judgements, and ultimately led to it shedding its potential for guaranteeing certainty. As a consequence, the individuals were forced to employ alternative strategies to achieve certainty. Such a situation turns out to be particularly difficult for people for whom certainty plays a fundamental role. On the one

hand, they feel a strong need to obtain certainty, while on the other, they are deprived of their existing means of achieving it. This leads to them potentially being more motivated to revise their previous expectations and views, and to look for new information on a given subject. In other words, they can be more epistemically motivated to engage in open-minded cognition, and thus counter-acting resistance to new and inconsistent facts.

Final Thoughts

The research mentioned above reveals that open-minded cognition is preferred (a) when a situation provides clues that “open” strategies are likely to be the most effective in achieving certainty, (b) when simplified inference is not possible, or (c) when people begin to doubt their previous modes of inference, whether this is a result of a threat to the self, the experience of a loss of power or control over the situation, or also when encountering credible (and by the same token impossible to ignore) information that is inconsistent with the individual’s existing knowledge and previous experiences.

However, the focus of these research efforts was mostly devoted to describing fundamental cognition (and measured this at physiological and neuropsychological levels). Thus, the open cognition that the researchers focused on refers to the readiness to select more complex, difficult, and effortful cognitive activity. It may include: seeking out new information, posing new hypotheses, taking care to meet the standards given in instructions, forming an impression about others based not on stereotypes, but rather on non-stereotypical information, received in “real time”. While all of the abovementioned examples referred to the non-specific motivation to reduce uncertainty, we feel that this model could also be fruitfully applied to the cognition motivated by the specific epistemic motivation. Moreover, traditionally researchers focus on identity-relevant cognitions as the best means to achieve certainty. However, there are many accuracy-oriented means that may also serve this goal (see Jonas et al., 2014). For example, for particular groups (e.g. journalists, scientists, etc.) ensuring accuracy may help obtain certainty in an improved manner (van Bavel & Pereira, 2018). The value of accuracy-oriented (i.e. open-minded, extensive, and effortful) strategies as a means of achieving certainty can be accomplished with incentives, and through education systems that cultivate curiosity, accuracy, and accountability. We believe, this eventually could lead to less tribe-like and polarized discussions that many societies experience nowadays.

Finally, we here focused on processing strategies rather than on knowledge per se. However, it is information selection and processing that leads to forming, changing, or maintaining existing beliefs (i.e. knowledge). If one accesses only a limited number of pieces of information, most likely restricted only to those consistent with one’s beliefs, there is a weak chance that these beliefs will be revised if incorrect. Furthermore, one’s views may further solidify, which will make them more resistant to change in the future. Therefore, it is so crucial to identify conditions which will prevent that from happening.

Note

- 1 Recent literature uses the terms *motivated cognition* or *motivated reasoning* in a narrow sense. That is, when one's prior beliefs act to bias information processing so as to make any conclusions congenial to these beliefs. It suggests that *motivated* implies *biased* and precludes *rational* (e.g. Druckman & McGrath, 2019). However, this is also related to the old but ongoing debate on whether biases in reasoning are due to motivation or cognition. We take the position that any cognitive and motivational influences prevail in virtually any epistemic activity. Thus, any cognitive activities are motivated by their very nature (see Kruglanski et al. 2020).

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12 Political Polarization Over Factual Beliefs

Roderik Rekker

Introduction

Concerns about political polarization have recently grown among scholars and the general public alike. Indeed, several studies have revealed that American voters who identify as Democrats or Republicans have developed increasingly hostile feelings about the other party and its supporters (Iyengar et al., 2012; Iyengar et al., 2019). Moreover, the political attitudes of American citizens have become increasingly connected to their party identification (e.g. Abramowitz & Saunders, 2008). Although most studies have focused on the American context, political polarization also appears to be widespread in European multiparty settings (e.g. Harteveld, 2021; Reiljan, 2020).

The large and growing scholarly literature on this phenomenon has commonly distinguished between *ideological polarization* (i.e. citizens' overall divergence and partisan alignment in political views; Lelkes, 2016) and *affective polarization* (i.e. citizens' sympathy toward partisan in-groups and antagonism toward partisan out-groups; Iyengar et al., 2012; Wagner, 2021). This chapter will argue that a third core pillar of polarization should be added to this taxonomy because citizens are divided not only in their attitudes and their feelings toward each other, but also in their factual perceptions of reality. For example, the vast majority (84%) of American citizens who identify as a Democrat accept the scientific consensus that climate change is caused by human activity, but less than half (43%) of Republicans share this position (Dunlap et al., 2016). Similar partisan differences exist in factual beliefs about key issues such as the size of the immigrant population (Sides & Citrin, 2007), the level of income inequality (Kuhn, 2019), the division of the tax burden, and the magnitude of defense spending (Lee et al., 2021). Indeed, about three-quarters of Americans believe that Republican and Democratic voters not only disagree over plans and policies, but also on "basic facts" (Pew Research Center, 2019). Lee et al. (2021) introduced the term *factual belief polarization* to refer to this phenomenon.

This type of polarization should be seen as normatively problematic because it can ultimately pose an existential threat to democratic government. First, it is commonly believed that a democratic debate requires at least some basic agreement on facts (Haas, 2018). As Delli Carpini and Keeter (1996, p. 8, 11) put

it, facts are “the currency of citizenship” that “prevent debates from becoming disconnected from the material conditions they attempt to address”. It becomes almost impossible for political opponents to cooperate or compromise when they lack a basic sense of shared reality. A particularly striking example of the threat to democracy that is posed by factual belief polarization manifested itself after the US presidential elections of 2020. Two weeks after Joe Biden was elected president, only 16% of Republican voters believed that he had legitimately won the election against 98% Democrats (YouGov, 2020). A peaceful transition of power after free and fair elections, which is often viewed as a defining feature of democracy (Dahl, 1998), cannot exist without a basic level of factual agreement on the electoral process and its outcome.

The second risk of factual belief polarization is that it erodes the factual basis for policymaking by undermining the position of experts and science. The idea that scientific inquiry constitutes the basis for informed policymaking lies at the core of modern society (Lasswell, 1951), but this pivotal role may be threatened when it is no longer recognized as an impartial and trustworthy authority. An effective response to the Covid-19 pandemic was for example complicated by distrust in experts among anti-establishment parties and their supporters. In both the US and Europe, citizens’ adherence to protective measures such as wearing a face mask was strongly associated with their party preference (EenVandaag, 2020; Kerr et al., 2021). Factual belief polarization could finally be an important source of other types of polarization. Although relatively little is known about the consequences of factual belief polarization for political attitudes and behavior, it is easy to imagine how partisan divides in factual perceptions could fuel ideological disagreements (i.e. ideological polarization) and political hostility (i.e. affective polarization).

The first section of this chapter will provide a brief overview of the general literature on political polarization. The second section will then discuss factual belief polarization as a third core pillar of this phenomenon, alongside ideological and affective polarization. The third section will finally discuss how disagreements over factual beliefs could be both a cause and a consequence of other types of polarization.

Political Polarization

Political polarization is an umbrella term for various forms of political dividedness. Over the years, the literature has drawn a variety of conceptual distinctions between different types of polarization. First of all, the term polarization can refer either to a *state* of political dividedness, or to a *process* toward such a state (DiMaggio et al., 1996). A second conceptual distinction can be made between *elite polarization* and *mass polarization*. Elite polarization refers to political polarization among political elites, such as the ideological positions of political parties or elected officials. Since the 1970s, American politics has been characterized by increasing levels of elite polarization. A large number of moderate

Democrats and Republicans in Congress have for example been replaced by outspoken liberals or conservatives (Hare & Poole, 2014). As a result, cross-party coalitions have become less common and congressional votes increasingly follow party lines (Coleman, 1997). In Western Europe, the ideological positions of political parties have also diverged somewhat during the twenty-first century, although the variation between countries and issues is stronger than differences over time (Dalton & Berning, 2021; Oscarsson et al., 2021).

Mass polarization contrarily refers to polarization among the general public, which can either manifest itself as *ideological polarization* or as *affective polarization*. Ideological polarization can in turn either refer to the overall *divergence* of issue attitudes in a society, or to the *alignment* of citizens' views with their party preference. Research on the American context has generally revealed little evidence for increasing levels of polarization in terms of divergence. Instead, the overall variation in Americans' ideological self-placement and most core issue attitudes seems to have been rather constant since the 1970s (Jocker et al., 2021; Lelkes, 2016). In sharp contrast to the stable levels of overall divergence, Americans' ideology and issue attitudes have however become much more aligned with their party identification since the 1970s (Abramowitz & Saunders, 2008). In other words, Democrats have become less likely to hold conservative views while Republicans are now less likely to take liberal positions. In Western Europe, the overall levels of ideological polarization contrarily seem to have remained relatively constant since the 1970s, but its object has shifted from traditional economic or moral issues to new cultural issues. For example, the overall variation in attitudes (i.e. divergence) toward economic redistribution and abortion has decreased in the Netherlands, while this variation has increased for attitudes about globalization and European unification (Dekker & Den Ridder, 2019). Likewise, the party preference and political identity of Dutch and Swedish citizens have become less connected to traditional moral and economic issues and more to views on immigration and European unification (Oscarsson et al., 2021; Rekker, 2016; Van der Brug & Rekker, 2021).

The second component of mass polarization is affective polarization, which refers to citizens' sympathy toward partisan in-groups and antagonism toward partisan out-groups (Iyengar et al., 2012; Wagner, 2020). The most commonly used measure of affective polarization is the "feeling thermometer" that asks respondents to rate their feelings toward their own party and the other on a thermometer scale from 0 (coldest) to 100 (warmest). This instrument reveals that affective polarization has increased dramatically in the US because the difference between the average score that Democrats and Republicans give to both parties has increased from about 25 points in 1990 to about 40 points in 2016 (Iyengar et al., 2012/2019). In 2016, Democrats and Republicans rated their feelings toward supporters of other party with a thermometer score of about 30 (Pew Research Center, 2016). These feelings had become even more hostile in 2019 when about eight-in-ten American partisans rated adherents of the other party coldly (Pew Research Center, 2019). Illustrating this partisan animosity, nearly half of Americans view adherents of the other party as "immoral

people” (Pew Research Center, 2016), while almost three out of ten consider them “a threat to the nation’s well-being” (Pew Research Center, 2014a), and almost two out of ten sometimes think the country would be better off if a large number of them “just died” (Kalmoe & Mason, 2018). While most studies on affective polarization have focused on the American context, a growing literature reveals that affective polarization is also widespread and increasing in Western Europe (e.g. Gidron et al., 2018; Gidron et al., 2020; Reiljan, 2020; Reiljan & Ryan, 2021; Wagner, 2020; Ward & Tavits, 2019; Westwood et al., 2018). Dutch voters for example give adherents of other political parties a score of about 40 degrees on the aforementioned feeling thermometer (Harteveld, 2021). Although this temperature is slightly higher than the average of 30 degrees among Americans, it is more hostile compared to ratings of almost any non-political outgroup. Moreover, much higher levels of affective polarization were found among and toward supporters of populist radical right parties in the Netherlands and Sweden (Harteveld, 2021; Reiljan & Ryan, 2021). Radical right voters and supporters of the Dutch green party for example rated their feelings toward each other at only about 20 degrees. Much like in the US, this hostility toward political opponents seems to have increased in the Netherlands and Sweden during the twenty-first century to a level that was last observed during the 1970s (Dekker & Den Ridder, 2019; Oscarsson et al., 2021).

In sum, recent decades have seen increasing levels of elite polarization and affective polarization, as well as of some manifestations of ideological polarization. This rise can be observed in both the US and Western Europe, albeit in somewhat different forms. Whereas the US has been characterized by growing divisions between the two major parties, Western Europe has seen polarization around new cultural issues and populist radical right parties. Many scholars have voiced concerns that increasing levels of (particularly affective) polarization could eventually pose an existential threat to democratic government (e.g. Carothers & O’Donohue, 2019; Levitsky & Ziblatt, 2018). As the Varieties of Democracy Institute (Lührmann et al., 2019, p. 19) put it, “Once political elites and their followers no longer believe that political opponents are legitimate and deserve equal respect, or are even acceptable as family and friends, they become less likely to adhere to democratic rules in the struggle for power”.

Factual Belief Polarization

Whereas the literature on polarization has commonly distinguished between ideological and affective polarization, this chapter argues that a third core pillar of polarization should be added to this taxonomy. Citizens are divided not only in their attitudes and their feelings toward each other, but also in their factual beliefs about reality. In one of the few articles that have systematically examined and conceptualized this phenomenon, Lee et al. (2021) introduced the term *factual belief polarization* to refer to this type of dividedness. Whereas ideological polarization refers to people’s beliefs about *what ought to be*, factual belief polarization refers to differential perceptions of *what is*. Like ideological polarization,

factual belief polarization can manifest itself either in terms of divergence or alignment and either among political elites or the mass public (Lee et al., 2021).

The notion of factual belief polarization is closely related to the concept of misperceptions, which were defined by Nyhan and Reifler (2010, p. 305) as “cases in which people’s beliefs about factual matters are not supported by clear evidence and expert opinion”. The common denominator of both phenomena is that (1) an objective fact is known according to evidence and expert opinion and that (2) there are factual beliefs that contradict this fact. The observation that most Republicans do not believe in anthropogenic climate change is for example a manifestation of both factual belief polarization and misperceptions. Nonetheless, there are two conceptual distinctions that separate both phenomena. First, in order to qualify as *political* polarization misperceptions must in some way be connected to citizens’ political views or identity. Citizens may hold misperceptions regarding any issue ranging from the health risks of salty food to the number of times that the New York Giants won the Super Bowl. Such differences can however only be seen as a manifestation of political polarization when they are associated with people’s political attitudes or identity. Such factual beliefs usually have direct implications for contested political policies (e.g. reducing CO₂ emissions), but they can also involve matters that polarize the worldviews of political groups more generally such as the notion of Darwinian evolution (Pew Research Center, 2014b).

The second distinction between a misperception and factual belief polarization lies in the degree of confidence with which citizens hold their inaccurate beliefs. Most (though not all) studies have defined misperceptions as incorrect beliefs that people hold with confidence (e.g. Flynn et al., 2017; Pasek et al., 2015). This conceptually distinguishes misperceptions from ignorance, which is defined as lacking a correct belief on an issue. As a result of this distinction, the literature on misperceptions has focused mainly (though not exclusively) on instances in which misinformed citizens confidently hold beliefs that are blatantly inaccurate. Examples include the misperception that Iraq had WMDs when the US invaded, that President Bush’s tax cuts increased government revenue, and that President Bush banned stem cell research (Nyhan & Reifler, 2010). This distinction between ignorance and misperceptions can however be more subtle for factual belief polarization. Take for example a situation in which the share of non-Western immigrants in a Western country is 30%. Very few citizens will know this exact number with confidence, but nearly all citizens may have at least some implicit assumptions about it. Moreover, such assumptions may be strongly connected to citizens’ attitudes on immigration. Imagine for example that opponents of immigration in the same fictitious country believe that the share of immigrants is roughly around 40%, while proponents estimate this number around 20%. Very few citizens in this example may hold their belief with great confidence or indeed pretend to know the exact number, but the implicit assumptions of proponents and opponents of immigration differ widely. Such instances of factual belief polarization may be consequential regardless of the degree of confidence with which citizens hold their perceptions.

Because of this distinction, the primary object of study is somewhat different for factual belief polarization than for misperceptions. Whereas misinformation research has focused mostly on instances in which citizens confidently hold blatantly inaccurate beliefs, the challenge for research on factual belief polarization lies more in identifying the (often implicit) factual assumptions that are intertwined with citizens' political attitudes on the most central political issues. Alongside the size of the immigrant population, other examples include the magnitude of income differences, the distribution of wealth, the amount of defense spending, or what powers have been delegated to the European Union by its member states. Nearly any political attitude is likely to be accompanied by at least some factual assumptions, even if citizens willingly admit that they are not quite sure about these beliefs or when they are not even consciously aware of them.

Empirical research on factual belief polarization around citizens' core issue attitudes is surprisingly sparse and lacks a common conceptual foundation. A noticeable exception is an article by Lee et al. (2021) that conceptualized factual belief polarization and compared its magnitude between American citizens and government officials. This study revealed that Democrats and Republicans have different perceptions on factual matters such as the amount health care spending, the division of the tax burden, the safety of GMOs, the prevalence of voter fraud, whether needle exchanges increase drug use, and the existence of climate change. This study also revealed that factual belief polarization is about equally strong among government officials and ordinary citizens, even though government officials typically hold more accurate beliefs. Providing another important manifestation of factual belief polarization, survey research in both the US and Europe reveals that citizens' factual perceptions of immigration are associated with their political attitudes on this issue (Alba et al., 2005; Gorodzeisky & Semyonov, 2020; Herda, 2010, 2013; Hjerm, 2007; Nadeau et al., 1993; Semyonov et al. 2008; Sides & Citrin, 2007). Compared to citizens who support immigration, opponents of immigration perceived the share of foreign-born citizens in their country to be larger in both absolute terms and relative to other countries. On another key issue, an international comparative survey revealed that citizens who perceive higher income inequality are more likely to support redistributive policies (Bobzien, 2020; García-Sánchez et al., 2020; Kuhn, 2019).

To conclude, the factual perceptions of both citizens and elites are commonly associated with their partisan identity, as well as with their attitudes on the political issues that facts relate to. This factual belief polarization is conceptually distinct (but closely related to) the notion of misperceptions. It can also be seen as a third pillar of mass political polarization, alongside ideological and affective polarization. Although several studies have demonstrated the existence of factual belief polarization, the number of studies on this issue is surprisingly limited and lacks a common conceptual foundation. A large number of studies have focused on misinformation and misperceptions (i.e. confidently held inaccurate beliefs), but comparatively little is known about

what implicit factual assumptions are associated with citizens' core political attitudes on issues like income redistribution or immigration.

The Causal Connection with Other Types of Polarization

Factual belief polarization may be viewed both as a potential cause and as a consequence of other types of polarization. First of all, citizens' factual perceptions may diverge as a result of elite polarization. As discussed above, levels of elite polarization have been surging for several decades (at least in the US). This increase is often viewed as a driver of ideological polarization among the mass public because many citizens use cues from politicians and parties to form their own opinions (e.g. Druckman et al., 2013), especially when elites are polarized (Levendusky, 2010). It is very likely that citizens also use such elite cues when forming their factual perceptions.

Citizens may also be influenced by elite cues when determining their trust in various sources of information such as the government, news media, or science. In this regard, the rise of anti-scientific and anti-elite ideologies in the past decades seems particularly relevant (e.g. Rekker, 2021). For example, Mooney (2005) argued in his book "The Republican War on Science" that factual belief polarization in the US has been driven by the emergence of the "New Right" since the 1970s. According to this account, the New Right has challenged the authority of science by for example creating think tanks as its own alternative source of information (Nash, 2014; Oreskes & Conway, 2011). Such alternative truth claims could subsequently be spread by ideological news media, such as the New Right's book publishing houses, radio, cable television, and Internet sites (Blee & Creasap, 2010; Davis & Owen, 1998). In line with this elite-driven account of factual belief polarization in the US, research reveals that Republicans have become increasingly distrustful of science compared to Democrats and that this process roughly coincides with the electoral and ideological breakthroughs of the New Right (Gauchat, 2012). Moreover, 21-st century politics in both Western Europe and North America has been characterized by the rise of populism. This ideology holds that politics is about a fundamental divide between a corrupted elite and a homogeneous people (Mudde, 2007). Research indicates that the anti-elite rhetoric of populist parties can fuel distrust among their supporters (Rooduijn et al., 2016). As a result, citizens' trust in public institutions has become increasingly connected to their party preference (Van der Meer, 2017). Because citizens' trust in various institutions is strongly interrelated, this process has likely contributed to a similar divergence of trust in information sources such as science and news media, which may in turn fuel factual belief polarization. Further emphasizing the role of populism, research reveals that supporters of populist radical right parties in Western Europe are much more likely than other citizens to distrust science and to hold misperceptions (Huber, 2020; Van Kessel et al., 2021; Van Vliet, 2019).

Factual belief polarization may also be driven by ideological polarization. To the extent that citizens' political attitudes guide their factual beliefs, increases in

the divergence and alignment of such attitudes should fuel factual belief polarization. Through *confirmation bias* (Nickerson, 1998), citizens for example tend to process new information in a way that reinforces their attitudes, rather than challenging them. Citizens who oppose climate policies may for example avoid news about the impact of humans on global warming and instead pay particular attention to climate skeptics. Likewise, research shows that citizens' attitudes on immigration importantly steer their interpretation of factual information about this issue (Glinitzer et al., 2021). It is also conceivable that citizens who are uninformed about a factual matter use their political attitudes as a *heuristic* to fill the gaps in their knowledge (Herda, 2010/2013). Even when they have never been informed about a precise number, opponents of immigration may, for example, reason that there "must be a lot of immigrants" in the country because otherwise immigration could not be as big a problem as they perceive it to be.

The increasing divergence in citizens' factual beliefs may furthermore be explained by increasing levels of affective polarization. People have a psychological need to form beliefs that maintain their status in an affinity group (Cohen, 2003; Kahan, 2016), which is commonly referred to as *identity-protective cognition* or *politically motivated reasoning*. When citizens become more emotionally invested in their political identity and more hostile toward opponents, they may also become increasingly prone to exclusively trust identity-consistent information from in-group members, while disregarding all identity-incongruent information from out-group members. As a result, scientists may for example be distrusted when they are perceived as political opponents, while science skeptics may be trusted when they are perceived as political allies. Roberts (2020) eloquently described this phenomenon as follows: "Tribal epistemology happens when tribal interests subsume transpartisan epistemological principles, like standards of evidence, internal coherence, and defeasibility. 'Good for our tribe' becomes the primary determinant of what is true; 'part of our tribe' becomes the primary determinant of who to trust". Supporting this mechanism, a panel study on American voters revealed that the use of partisan media fuels misperceptions and that this relation is partly mediated by increased levels of affective polarization (Garrett et al., 2019). Another study showed that Americans who report hating their political opponents are the most likely to share political fake news on Twitter (Osmundsen et al., 2021). Moreover, an experimental study found that Democrats increased their perception of unemployment under Donald Trump's presidency as a result of experimentally induced affective polarization, although such effects were not found in all instances (Broockman et al., 2020).

The idea that factual belief polarization is strengthened by ideological and affective polarization is thus supported by an extensive theoretical and empirical literature, but much less is known about the reverse effect of factual beliefs on other types of polarization. First of all, it seems almost self-evident that factual belief polarization could contribute to ideological polarization because factual perceptions (e.g. on the causes of global warming) have direct implications for political policies (e.g. reducing CO₂ emissions). Citizens who perceive greater levels of income inequality may, for example, see a greater need for redistribution

(McCall et al., 2017) and those who perceive a larger immigrant population may consequently feel a greater urgency to restrict immigration (Semyonov et al., 2004). This relevance of factual perceptions for political attitudes suggests that citizens may become increasingly ideologically divided when their factual beliefs diverge. Nonetheless, empirical findings on this causal relation are surprisingly inconclusive. Some experimental studies revealed that respondents indeed change their attitudes when their misperceptions are corrected (Becker, 2019; Cruces et al., 2013; Howell & West, 2009; Grigorieff et al., 2020; McCall et al., 2017; Scotto et al., 2017; Sides, 2016), but other studies found no such effect (Berinsky, 2009; Hopkins et al., 2019; Jørgensen & Osmundsen, 2020; Kuklinski et al., 2000; Lawrence & Sides, 2014; Trump, 2018). Further complicating this matter, the observation that corrections of misperceptions often fail to change attitudes cannot be taken as evidence that misperceptions themselves have no effect. Attempts to correct misperceptions may invoke a defensive reaction from respondents so that they either reject the corrections directly or refuse to adjust their attitudes. As Flynn et al. (2017) put it: “misperceptions can have important consequences for policy debate and public attitudes even if correcting them does not change people’s opinions”. It is therefore yet unclear if factual belief polarization should be seen as an important source of ideological polarization or mainly as its epiphenomenon.

Whereas little is known about the effect of factual belief polarization on ideological polarization, even less is known about its effect on affective polarization. It is easy to imagine how a shared sense of reality can constitute a buffer against affective polarization by ensuring at least a basic level of understanding for the other’s position. If factual beliefs are far apart, this means that the political camps will see the other not only as perhaps having the wrong ideas, but as not getting reality at all, which is easier to condemn than mere disagreement. Opponents of climate policies may for example maintain some understanding for climate activists as long as they at least share their factual perception that the climate is changing due to human activity. Contrarily, climate skeptics who believe that climate change is a hoax may be much more hostile toward climate activists, as well as vice versa. Moreover, more extreme manifestations of factual belief polarization can include conspiracy theories about the evil nature and hidden motives of political opponents. Hostile feelings toward Democrats may for example have skyrocketed among Republicans who embraced the QAnon narrative that the Democratic Party is ruled by satanic pedophiles. Nonetheless, empirical evidence for the role of factual beliefs in affective polarization has yet to be established.

All things considered, the theoretical and empirical literature strongly suggests that factual belief polarization can be fueled by elite polarization, ideological polarization, and affective polarization. Factual belief polarization may in turn also strengthen other types of polarization, although the empirical evidence for this reverse effect is still sparse and mixed. [Figure 12.1](#) provides a visualization of how mass polarization may be viewed as a phenomenon with three main components that are both conceptually and causally interrelated.

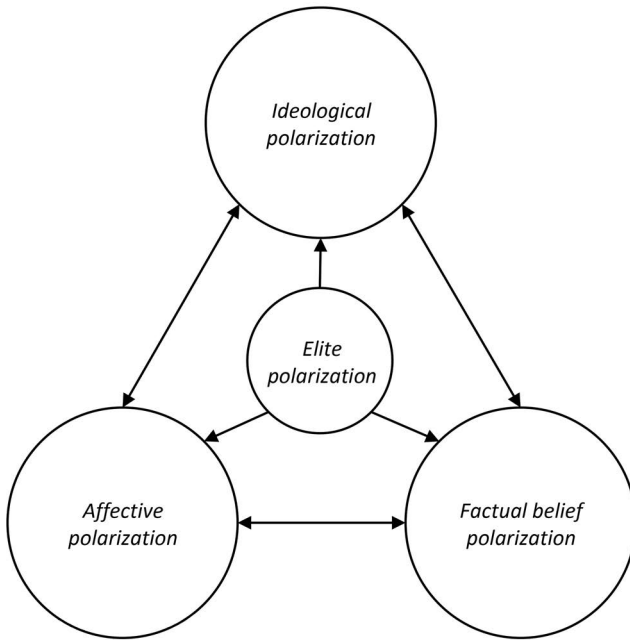


Figure 12.1 Mass Polarization as a Trichotomy of Conceptually and Causally Interrelated Components.

Conclusion

Recent decades have seen increasing levels of political polarization in both the US and Western Europe. Whereas the literature has commonly distinguished between ideological and affective polarization, this chapter proposed that factual belief polarization should be added to this taxonomy as a third core pillar. Alongside their conceptual similarities, these three components of mass polarization may also share important causal interconnections.

Despite the extensive and rapidly growing literature on both polarization and misperceptions, surprisingly few studies have examined citizens' factual perceptions through a lens of political polarization as proposed in this chapter (exceptions: e.g. Lee et al., 2021). Therefore, relatively little is known about factual belief polarization, even (or perhaps especially) at a basic descriptive level. The first step for future research is therefore to provide a much better description of factual belief polarization across a variety of core political issues, groups of citizens, and contexts. There is a great need for comprehensive answers to questions such as: "How do Democrats and Republicans differ in their perceptions of the income distribution?", "What do leftist and (radical) right voters in Europe think is currently the share of immigrants in their country?", "Are such divides particularly wide or narrow among specific groups such as political elites or highly educated citizens?", "Is factual belief polarization stronger

in some countries than in others?”, “Have such divides increased or decreased over time?”, “Does factual belief polarization exist on just some or nearly all policy issues?” Research may also compare how strong and widespread factual belief polarization is compared to other forms of polarization. Some political issues may for example be subject to factual belief polarization but not affective polarization or vice versa. The question when and to what extent citizens hold their polarized factual beliefs with confidence is also of particular importance. Whereas most studies on misperceptions featured confidently held beliefs as part of their conceptual definition and thematic choices, the degree of certainty with which citizens hold their beliefs is very much an open empirical question for research on factual belief polarization.

Another core research challenge is to determine the consequences of factual belief polarization, especially for ideological and affective polarization. Moreover, this impact may very well differ between various types of citizens and issues. It for example seems almost self-evident that citizens’ factual perceptions about the degree and causes of climate change must have causal effects on their issue attitudes about climate policies. Contrarily, it for example seems less obvious if factual perceptions about the income distribution are also a causal determinant of people’s attitudes on redistributive policies. Some people may favor larger or smaller income differences regardless of how large these differences currently are (Trump, 2018). Moreover, the degree of confidence with which citizens hold their beliefs may or may not moderate their impact. It is very much an open empirical question if and when implicit factual assumptions affect citizens’ issue attitudes, even if such perceptions are held with a very low degree of confidence.

Future research can finally also focus on strategies to prevent and reduce factual belief polarization. Research has shown that it can be difficult to correct confidently held misperceptions (Nyhan & Reifler, 2010), but it might prove easier to correct citizens’ implicit factual assumptions about political issues. A particularly interesting prospect of such research is that it may eventually contribute to strategies for countering political polarization more generally. Reducing factual belief polarization by informing citizens about basic political facts, for example in civics classes or news media, could potentially provide a relatively feasible and effective strategy against ideological dividedness and political hostility.

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13 The Democratic Gold-Standard of Fact-Based Issue Ambivalence

Jacob Sohlberg

Introduction

Political attitudes correlate strongly with perceived facts. These perceived facts vary in their level of accuracy. For example, the political attitude position that we should fight climate change may be underpinned by the perceived fact that emissions are leading to reduced biodiversity. It may also be based on the perceived fact that sea levels will rise by 100 meters (320 feet) over the next 100 years. According to the current understanding of climate research, the perception that biodiversity will decrease is correct whereas the perception that sea levels will rise to that extent is incorrect (IPCC, 2014; Lindsey, 2021). What unites them, however, is that they are both associated with the same attitude position on the issue – we should address climate change.

Many political issues, and especially the complex and controversial, are characterized by perceived facts that support both for and against positions. Turning again to climate change, an issue where most facts favor a position that it needs to be addressed quickly and forcefully, some facts nonetheless show that climate change also brings positive change. For example, longer growing seasons in previously cold regions could help agriculture and the opening up of the Northwest Passage between the Atlantic Ocean and the Pacific Ocean increases the possibilities for more efficient shipping (Bennett, 2019; Herring, 2020). Meanwhile, there are many incorrect reasons for not fighting climate change, such as the belief that the climate is undergoing normal variation (IPCC, 2014).

Based on these two dimensions, attitude position (for or against) and perceived fact (correct or incorrect), it is possible to create a stylized two-by-two, which is outlined in [Table 13.1](#). As I will argue in this chapter, citizens should believe in facts and disregard incorrect evidence, regardless of which political issue positions they underpin. Thus, on most complex political issues, they should embrace perceived facts that end up in both cells of the left column (white background) while ignoring perceived facts of the right column cells (grey background). Drawing on previous research on considerations, ambivalence, misperceptions, information-processing and related strands of research, as well as normative observations, the chapter makes a case for this *democratic gold-standard* of public opinion. The terminology is high-minded for a reason.

Table 13.1 Political Issue Position and the Accuracy or Inaccuracy of Perceived Facts

		Perceived facts (correct/incorrect)	
		Correctly for	Incorrectly for
Political issue position (for/against)		Reduced biodiversity	100-meter sea level rise
	Example: fighting climate change	Correctly against Better agriculture in select areas	Incorrectly against Normal variation in the climate

It has long been noted that democracies function poorly unless citizens have a shared understanding of pertinent facts (Berelson, 1952). It is especially important during elections. For example, when citizens do not accurately assess politicians' past actions, retrospective voting is not as meaningful, and, by extension, politicians are not held accountable to the degree they should. Moreover, the chapter suggests that believing in facts that are in line with both sides of an issue is not just a worthwhile normative goal on its own, but also a means to a more politically engaged and discerning electorate.

The chapter also proposes an empirical approach of studying the extent of knowledge resistance on complex political issues that builds Table 13.1. The possibilities for future research based on this approach are underscored by the results from an empirical illustration of the reasons people provided for or against nuclear power at a 1980 referendum survey conducted in Sweden. According to this survey, perceived facts dominate as reasons behind individuals' issue positions over broader value-based reasons. Moreover, most facts were accurate rather than inaccurate. While this study took place years ago, and not in the current high-choice media environment, it hints at important scope conditions relating to the field on misperceptions, and suggests that generalizations about knowledge resistance may have been inflated. There is no denying that many people often fail at accepting established knowledge, but the extent of the problem might look different depending on the empirical framework.

Before continuing, some clarifications are necessary. First, political issue positions generally fall on a continuum ranging from completely for to completely against, with a midpoint of neither for nor against in the middle. In this chapter, I simplify this more precise description of the attitudinal continuum into two positions: for or against. Second, the terminology I rely on – for or against – is frequently not used when it comes to real-world political issues. For example, positions on abortion in the US are referred to as pro-choice and pro-life. Obviously, what the for or against positions means depends on how the issue is stated. For instance, abolitionists were *for* ending the practice of slavery and *against* keeping it. Third, perceived facts are sometimes not entirely accurate or entirely inaccurate, but somewhat accurate or inaccurate. Relatedly, the level of accuracy may also be probabilistic, indicating that the science has to varying degrees settled on what is

true. For example, when it comes to climate research, the likelihood of outcomes described in the IPCC Fifth Assessment Report varies from 0 to 100, and IPCC authors are recommended to use different terminology to describe their likelihood (Mastrandrea et al., 2010).¹ Here, I treat facts as either accurate or inaccurate, which is another simplification. I define what is accurate or inaccurate as our best guess given the overall and current scientific evidence.

Diverse Considerations in Memory

Consideration Models of Political Attitudes

In a groundbreaking series of studies published in the early 1990s, Feldman and Zaller (Feldman & Zaller, 1992; Zaller, 1992; Zaller & Feldman, 1992) provide a solution to a puzzle that had plagued political science since Converse's (1964, 1970) finding that ordinary people are so inconsistent in their political issue positions that they appear to have non-attitudes. That is, people do not structure their political attitudes systematically and they vacillate between different positions on the same issue over time. Before that, attempts to explain why democracy can still function given the apparent struggle of the public to have meaningful opinions ranged from studies that emphasized measurement error (Achen, 1975) to the political climate of the US of the early post-war period (Nie & Andersen, 1974).

In Zaller and Feldman's (1992) conception, however, social scientists need to think about the issue from a different perspective. Instead of assuming that people have true attitudes, they have considerations. In their survey design, respondents were asked to "stop and think" before answering the political issue questions. With these prompts to give reasons, it turns out that people often have multiple considerations – sometimes conflicting – behind their positions. For example, an individual may think that abortion should be allowed because a woman should have a right to decide over her own body, an unwanted child is likely to have a more difficult life, and the planetary resources are strained as it is. The same individual may also believe that abortion shares similarities with murder, and be against abortion for this reason. If these considerations are averaged across equally, the person is likely to take a pro-choice issue position. On a different day, perhaps after meeting a newborn, the consideration that abortion is akin to murder may carry more weight or be more accessible, and faced with a survey question on this particular day, the respondent might take a pro-life position instead. This does not mean that the considerations in long-term memory are different, only that they are weighted differently depending on the context.

The consideration models in political science were mirrored on earlier research in psychology that also emphasize that attitudes are based on memory structures in long-term memory. Based on several studies, Tourangeau (1984) and Tourangeau and Rasinski (1988) conclude that answering a survey question requires several steps:

- *Question interpretation.* In this step of making sense of the question, respondents need to find the appropriate attitude structure. This process can be very quick (taking milliseconds) if the attitude is highly accessible.

- *Retrieval.* The retrieved content depends on respondent beliefs and considerations as well as other cues like positions of trusted leaders. Beliefs/considerations are not equally likely to be retrieved. Instead, highly accessible beliefs are more likely to be retrieved in a process that shares similarities with sampling from a larger set.
- *Render judgment.* Based on the information retrieved, people make a summary statement. This can be fairly easy if the evaluations point in the same direction, but often the set of beliefs are conflicting, making for a more complex judgment process.
- *Report answers.* The judgment is mapped onto the answering scale, while concerns about social desirability and consistency are taken into account.

Not only could such a process explain the apparent issue inconsistencies found by Converse, it could also provide an explanation for results based on framing studies. For example, in a famous experiment, people who view the prospects of a KKK rally on campus as a free-speech issue tend to think of it in a more favorable light compared to if it is described as an issue that concerns security (Nelson et al., 1997). A simplistic way to view this finding is that people are easily duped into saying anything because they do not hold attitude positions. However, a more realistic interpretation is that people tend to view complex issues through the prism of salient considerations, and this colors their survey responses (Druckman, 2001). Thus, the fact that people seem notoriously poor at making the tradeoff between two worthwhile policy positions, e.g. between tax cuts and increases in government spending, could be interpreted as an indication that they hold considerations that favor both. Their have-your-cake-and-eat-it-too type of survey answers are simply reflections of this mix of considerations.

Ambivalence

The findings on considerations spurred research on ambivalence, which is defined as having contradictory ideas about something. Theoretically, it is grounded in the idea that attitudes are best understood not as bipolar (like vs dislike or approach vs avoidance) but rather as two separate dimensions where it is possible to simultaneously like or dislike what might have been simplified into two endpoints of a scale (Cacioppo et al., 1997).

The applications of ambivalence in political science are still limited given its potential, but the studies based on this framework in relation to political attitudes show important results. One study concerns social welfare policies in the US. It is based on the idea that Americans of all stripes tend to value individualism, limited government, equality, and democracy – core principles that are partially in conflict. These values, in turn, are brought to bear when ordinary people answer survey questions related to welfare policies. Especially left-leaning individuals tend to express conflicting ideas on this issue. For example, many say that it is important that people make an effort and take responsibility for their lives, but simultaneously think that the government should step in and help

people who are struggling, thus emphasizing both individualism and egalitarian principles (Feldman & Zaller, 1992).

Another political application of ambivalence relates to its connection with the two major US political parties. American politics is often described as highly polarized, perhaps now more than ever during the modern era (Mason, 2018). Yet even in this partisan environment, around 30–50 percent have ambivalent evaluations about the parties (Lavine et al., 2012). Thus, in spite of a hyper-partisan context where citizens are motivated to be non-ambivalent toward the parties, a large share of the electorate sees both good and bad aspects of the parties.

The studies that actually do make considerations a central part of the research often help in providing new insights into how the public forms political opinions, make judgments and answer survey questions on diverse issue topics. The research on partisan ambivalence offers the perhaps clearest example, but other studies indicate that it can also help us understand preferences about political candidates (McGraw et al., 2003) and welfare politics (Feldman & Zaller, 1992), hinting at the concept's versatility. Most of this research is US-based, and there are complexities involved when applying the concept in other contexts. For example, partisan ambivalence can fairly easily be studied in a two-party system, but how should it be examined multiparty systems? Such issues can be addressed, however, as Steenbergen's (2020) study on partisan ambivalence in the German multiparty context demonstrates.

Considerations as Motivations

In general, people want to expend as little reasoning power as possible in a given situation. When people rely on high-status sources over low-status sources to help make decisions, it is an example of this principle at play (Fiske & Taylor, 1991). The extent to which cognitive shortcuts can be a substitute for systematic processing of a complex political information environment is debated; see, for example, the argument of low-information rationality (Popkin, 1991) but it is clear that these simplifying tendencies sometimes lead people astray. One example of this is the so-called halo effect where people draw on the characteristics of individuals in one domain (e.g. how warm or cold a speaker is) in order to make generalizations about unrelated domains (Nisbett & Wilson, 1977). The tendency is also noted in politics where more attractive candidates are perceived as more competent and are also more likely to get votes (Verhulst et al., 2010). Given well-known limitations on human processing and working memory (Miller, 1956), and the massive number of judgments facing people every day (e.g. we make around 200 decisions just about food every day, often without conscious thought; Wansink & Sobal, 2007), it is understandable that people need to make decisions quickly and with as little effort as possible. With this in mind when it comes to considerations and issue positions, a common consideration when of ordinary citizens should be the issue positions of trusted political leaders, presumably at the expense of facts and value-based reasons.

However, tendencies toward fast thinking are counteracted by another motivational goal: accuracy. This goal is favored when people are no longer certain that they will make the best decision, and are therefore motivated to engage in effortful and systematic processing. There is no denying that given the right conditions, people are willing and capable of more systematic thinking, and there are a number of factors that condition the degree to which people engage in more accuracy-driven thinking according to traditional dual-process models (Eagly & Chaiken, 1993; Kahneman, 2011; Petty & Cacioppo, 1986), but the preponderance of political science research indicate that accuracy-minded thinking exerts a weak force on the public. One example is the widespread use of party cues and other resource-saving tools over decision-making based on more complex tools such as ideology (Campbell et al., 1960; Lau & Redlawsk, 2001). Equally pertinent illustrations of how low-effort cognitive tools are favored over accuracy come from the research field on the relationship between political attitudes and perceived facts.

The Link Between Political Attitudes and Information

While there is a consensus on the association between facts and political attitudes, there is an ongoing debate about the causal direction between them. One side proposes that as people learn new domain-specific facts, they adjust relevant political attitudes accordingly. Often, this relationship has found empirical support in the connection between the state of the national economy and government approval. Studies from multiple countries indicate that when the economy is doing better, it tends to favor the incumbent government (Lewis-Beck & Stegmaier, 2000; Lewis-Beck & Stegmaier, 2007). A similar conclusion about this causal direction is reached in a study on the consequences of factual knowledge about crime and foreign aid on policy preferences. Using survey and experimental data from the 1980s and 1990s, the findings indicate that people update their positions depending on the correct information (Gilens, 2001). Thus, there are notable studies that support this connection between facts and issue positions. However, this causal interpretation, which would be indicative of accuracy-driven thought, has underwhelming empirical backing overall.

Instead, the causal perspective that people rely on their prior attitudes to tell them which facts are right or wrong is dominant. For example, a study that relies on the panel component of the American National Election Studies finds evidence in favor of the interpretation that positions precede facts; it appears that perceptions of the national economy are affected by the approval of the president (Evans & Pickup, 2010). Thus, even on objective facts that can easily be verified, such as economy, people use their priors to guide them in what is accurate or incorrect (Bartels, 2002).

The tendencies of people to let their political issue positions inform their perceptions of facts can be explained by a string of mechanisms, jointly often referred to as (directional) motivated reasoning. Many well-cited studies have documented motivated reasoning over the decades (Kunda, 1990), with political

science being no exception. For example, in a particularly influential study based on experimental data on the issues of affirmative action and gun control, Taber and Lodge (2006) find that subjects try to avoid information that runs counter to their prior attitudes, and if they encounter it, they spend more resources in arguing against counter-attitudinal information compared to attitude-congruent information. According to this research, part of the reason people defend their issue positions is that they are imbued with emotions, which immediately and automatically affect information processing (Lodge & Taber, 2013). Thus, far from approaching information evenhandedly, directional thinking takes precedence.

Perceived Facts

Misperceptions and Accurate Perceptions

Self-serving political misperceptions are one of the most pernicious examples of motivated reasoning. As Szewach, Reifler, and Oscarsson (2022) describe in [Chapter 9](#), there seem to be widespread beliefs in false information among diverse groups and on different topics. There has been a concern that these misperceptions are a form of partisan cheerleading, where reported misperceptions are another way to express support for favored political groups (Bullock & Lenz, 2019). That account is partially accurate, but experimental evidence suggests that they are also real and persistent even in the presence of monetary incentives (Peterson & Iyengar, 2021). Moreover, to the extent that misperceptions can be corrected, as in the case about the size of the immigrant population in the US, even if accurate facts are accepted, an attitudinal change in line with them does not appear to follow (Hopkins et al., 2019). One possible reason for the lack of more meaningful consequences of accurate information is that even as new facts are integrated, the interpretation of those facts still serves partisan goals (Gaines et al., 2007). Similarly, Bisgaard (2019) finds that if the favored party is in power and the national economy is performing well, the party is given credit for the good economic conditions, but not blamed for poor economic conditions. Accordingly, even when new facts are received, they do not alter attitudes.

From a normative perspective, the issue is straightforward. Based on the enlightenment ideals of empiricism, reason, and the overall emphasis on the scientific method, a democracy relies on a common understanding of relevant facts. At the very core, it is what makes retrospective and prospective voting possible. Without relevant facts at hand, citizens are not able (or willing) to hold politicians accountable for past behavior and unable to make informed decisions about who has the best solutions to societal challenges. If politicians are untethered from the electorate in this manner, their incentives for improving societies and working for the common good are reduced (Besley, 2006; Healy & Malhotra, 2013).

The literature on misperceptions points to a critical distinction that is relevant for the considerations literature as well. Just as the knowledge literature did not

initially differentiate between misinformed and uninformed but instead focused on the distinction between informed and uninformed (Delli Carpini & Keeter, 1996), has the considerations literature not sufficiently integrated this key difference. Now, there are studies on the relative frequencies between different considerations in the form of cues, values and beliefs. For example, people frequently (around 40 percent of the sample) invoke values for their positions on welfare-related issues (Feldman & Zaller, 1992).² However, there is little research on the extent to which belief-type considerations are accurate or inaccurate.

With study upon study documenting predisposition-driven motivated reasoning and misperceptions, along with other examples of biased and myopic processing (Achen & Bartels, 2017), it is tempting to get downtrodden about the public, and the prospects of a properly functioning democracy. Yet before reaching that conclusion, it is imperative to consider the factors that lead to more systematic reasoning and openness to facts.

Competing Motivations and Prospects for Accurately Perceived Facts

As is indicated by the studies above, political science has documented a number of biases and examples of motivated reasoning, but there are also studies that examine the factors that condition such tendencies and put people on a more accurate-driven cognitive path. One factor relates to political awareness (sometimes called political knowledge or sophistication). Much has been made, both theoretically and empirically, about the benefits of a politically aware electorate. According to this reasoning, people need to have a certain level of civic understanding in order to successfully participate politically. However, polls of political awareness conclude that knowledge levels in the aggregate are low, with many people not knowing basic facts about the political systems and political actors (Delli Carpini & Keeter, 1996).

Yet it seems from much of the political science literature that awareness only exacerbates motivated reasoning (Taber & Lodge, 2006). In fact, similar concepts such as education and science literacy are also appear associated with greater belief polarization on scientific issues (Drummond & Fischhoff, 2017). This could be interpreted as an example where sophisticated individuals are using their greater cognitive firepower to protect cherished attitudes and groups. Thus, more thinking, it appears, is used for rationalizations and not reasoning.

These tendencies fly in the face of the dual-process models from psychology, however. According to them, a greater focus on systematic processing should make people more likely to engage in deliberation and comprehension, which would counteract directional motivated reasoning tendencies (Eagly & Chaiken, 1993; Petty & Cacioppo, 1986). Indeed, recent evidence based on several design innovations suggests that cognitive sophistication, measured through the cognitive reflection test, is not associated with greater political disagreements among the most sophisticated (Pennycook & Rand, 2019; Tappin et al., 2020). This perspective on thinking is not absent in political science. For example, Arceneaux

and Vander Wielen (2017) provide a model that is more in line with the traditional perspective of the dual-process models where greater elaboration is associated with more reflection and responsible for *Taming Intuition*, which is the apt title of their book.

There is more of a consensus about the consequences of being politically conflicted, however. By and large, people who are attitudinally ambivalent are less likely to rely on easy cognitive shortcuts and more motivated to act in their best interests politically. Furthermore, they treat political information more evenhandedly (Lavine et al., 2012). Similar tendencies are observed among individuals who are cross-pressured, meaning that they are internally conflicted because important groups or issue positions do not line up (Hillygus & Shields, 2008; Lazarsfeld et al., 1944) or are coalition-straddling voters who are selecting between opposing party blocs rather than selecting between parties within the same coalition (Sohlberg & Fredén, 2020). All these factors tend to make people more focused on accuracy over quickness.

In addition, dramatic events can also make people more accuracy-minded, especially if people feel anxious. Unlike other negative emotions like anger, anxiety tends to make people more attentive to their surroundings and less reliant on deep-seated political predispositions to color their judgments (Marcus et al., 2000; Valentino et al., 2008). There are also other emotions, like compassion, that temporarily can make people view issues like immigration in a different light, which people did in the immediate aftermath of seeing the picture of the drowned toddler Alan Kurdi (Sohlberg et al., 2019). That said, the effects of emotional events may be fleeting, and after some time of processing, people return to their baseline attitudes and beliefs (Sniderman et al., 2019).

In sum, it seems as attitudes, once formed, are difficult to change, come to mind automatically and quickly, and often color subsequent political judgments (Lodge & Taber, 2013). Still, given proper motivation, many individuals are able to overcome these initial tendencies, much like the subjects in Devine's (1989) famous study on how automatic stereotypes can be overridden with conscious effort. Thus, while people may initially believe in false information, they can counteract this tendency, at least if they put in enough cognitive effort (Gilbert et al., 1993). Thus, misperceptions can be partially corrected, especially if they are debunked with detailed information, but the best approach is to not let them be established at all (Chan et al., 2017) because ordinary citizens' motivation to override false information often seems to be lacking on political issues.

A Research Agenda Based on Considerations and Misperceptions

As noted previously, studies on considerations do not differentiate between accurate and inaccurate considerations on political issues. This distinction is central in research on misperceptions, a research field that has focused our attention on the number of issues plagued by them. However, in spite of these strides, it is still not well understood how prevalent beliefs in falsehoods are on issue domains.

It is possible that people may be partially misinformed, but also partially informed if the issue is studied more comprehensively. That is, they may have a mix of considerations that are either based on correct or incorrect facts, and knowing the balance of this is necessary before drawing conclusions about the pervasiveness of knowledge resistance. Furthermore, given the research on the multitude of factors that condition quick versus systematic thinking, it is important to better understand how they influence the relative balance of correct and incorrect considerations.

In addition, we know too little about the relative mix of statements that are congruent with “pro” or “against” positions on the issues, and especially how they combine with beliefs in accurate and inaccurate reasons. At least according to the literature on partisan ambivalence, it is common for people to simultaneously think about reasons to like and dislike the parties, yet this research is generally not concerned with the accuracy of the considerations.

The methods and the framework of the considerations literature, with its focus on multiple reasons, could help in systematically studying this issue. However, the methods to retrieve considerations are not without flaws. For example, people partially sidestep the consideration retrieval and base their evaluations on snap judgments instead (Kraft et al., 2015; Lodge & Taber, 2013). Thus, stated considerations will not give us the whole picture of how political evaluations are made. Still, the reported considerations that draw on perceived facts can be rated based on their level of factual accuracy, and it is clear that consciously stated considerations can have profound consequences on political behavior (Lavine et al., 2012). Moreover, it would be helpful to know the relative mix of considerations that are based on perceived facts compared to other considerations such as broader, value-based considerations or other considerations. As far as I know, neither research on misperceptions nor considerations has looked into this question. The relative frequency of considerations that concern facts presumably varies depending on the issue, but knowing this number is the first step before the balance between accurate and inaccurate facts can be examined. In what follows next, I will provide a brief empirical example of this framework.

A Brief Illustration: The 1980 Nuclear Power Referendum in Sweden

In the aftermath of the 1979 nuclear power plant accident in Harrisburg, and against the backdrop of several oil crises, a heated political debate about the future of nuclear power took place in Sweden. With disagreements between the governing parties and internal conflict within the biggest opposition party, politicians decided to let voters decide the issue through a referendum, perhaps hoping to defuse the explosive concern.

When the referendum took place, one of the most resource-intensive election surveys in Swedish history was conducted. Importantly, the referendum survey includes an open-ended question that asks respondents about their reason(s) behind their position on nuclear power. The question was asked immediately

after they had stated their position. Thus, the survey design follows the “retrospective probe” format and not the “stop-and-think” format. According to Zaller and Feldman (1992), both formats tend to generate multiple reasons (around three in their research), where the latter seems to yield more considerations while the former more directly measures the reasons behind an attitude.

The purpose of this brief empirical illustration is two-fold: first, to assess the frequency of reasons that directly make references to perceived facts and, second, to explore the levels of accurate versus inaccurate reasons. Obviously, the nuclear power issue is highly technical, which presumably calls attention to perceived facts over broad and value-based reasons or other reasons (e.g. political leader positions). Yet, in this respect, the issue shares similarities with other technical issues of today, such as climate change and vaccinations, which appear marked by conflict and misunderstandings. Another concern is that accuracy may have been more valued in the 1980s and in Sweden than it currently is, which would make generalizations difficult. Of course, there is no denying that Sweden was different then compared to, say, present-day US, where it is much easier to be selective about information and information sources. (See [Chapter 3](#) by Strömbäck et al., 2022 for an in-depth discussion about media-related issues.) However, in Sweden around the referendum, there was a high level of political polarization on the issue (Asp & Holmberg, 1984) and partisan attachments were much higher than today. In fact, directional motivated reasoning is notable in the earliest Swedish election surveys from the 1950s as well as in the latest from the 2010s, where supporters of whatever government that is presently in power think that economic conditions are better than non-supporters. This indicates that Swedes were not much different compared to the participants in the motivated reasoning studies of the time (Lord et al., 1979).

While the data can help in answering these two questions, it cannot speak to the relative frequency of ambivalent reasons within respondents since they unfortunately were only probed for consistent reasons. That is, people who said they were for nuclear power were only asked about reasons consistent with this position while those against nuclear power were only asked about reasons against. To address ambivalence on the issues, reasons for both sides need to be measured. Yet in spite of this limitation with the nuclear power referendum survey, it is possible to illustrate the framework’s potential.

As [Table 13.2](#) shows, a large majority of respondents report perceived facts as reasons for their position on nuclear power. Among the first reason reported,

Table 13.2 Type of Considerations Behind Nuclear Power Position

	<i>1st reason</i>	<i>2nd reason</i>	<i>3rd reason</i>	<i>4th reason</i>	<i>5th reason</i>
Perceived fact	84%	82%	83%	74%	67%
Value-based	12%	11%	12%	15%	27%
Other	4%	6%	5%	11%	7%
Total	100%	100%	100%	100%	100%
Observations	1,307	771	278	62	15

84% relied on something they perceived as a fact. Examples of perceived facts include, “Nuclear power reduces our dependence on foreign oil”, and “Hydro power is more environmentally friendly than nuclear power”.³ Value-based reasons account for 12% of the reasons. Reasons in this category are not primarily based on specific facts, but instead on ideological reasons like the statement that “Nuclear power is an expression of capitalism” Only 4% of the first reason are categorized as other. Examples in this category are references made to the parties’ positions, re-iterations of the policy position and broad statements about general risks. While perceived facts continue to dominate as reasons, also when probed for additional considerations, there is a trend toward more value-based reasons at the expense of perceived facts, but this tendency is weak and only based on a small share of respondents.⁴

The second aim of this brief illustration is to explore the relative balance between correct and incorrect reasons.⁵ Table 13.3 shows that most perceived reasons are correct, with 79% versus 21% in favor of accurate facts over inaccurate. That is, a large majority of the reasons are correct rather than incorrect. This implies that people are not just providing any reason, but are discriminating in favor of accurate facts. Gradually, as people report more reasons, they are somewhat less accurate (1st: 79%, 2nd: 74%, 3rd: 62% and 4th: 61%). The reduction in correct fact considerations is not related to sample composition differences. This indicates that people reach for fact-based arguments first and then gradually resort to less accurate facts. Still, in general, they stop providing reasons before resorting to falsehoods.

Another finding from Table 13.3 is that correct facts appear more prevalent among those who are against nuclear power (95%) compared to those who are for nuclear power (63%). The underlying reasons for this discrepancy are beyond the scope of this short illustration, but one possibility is that those for nuclear power are less accurate-minded on this particular issue compared to those against it. Still, even with this difference in mind, the major point is that correct reasons dominate on both sides of this issue. Thus, at least on this particular issue, misperceptions appear less of a problem than what recent research indicates. Obviously, more research is needed, and especially on current issues, before such a conclusion could be generalized, but it does suggest that misperceptions are far from inevitable, even on radioactive issues.

Table 13.3 For or Against Nuclear Power by Correct and Incorrect Facts, 1st Reason

	<i>Correct</i>	<i>Incorrect</i>
For	63% (339)	37% (203)
Against	95% (527)	5% (30)
Overall	79% (866)	21% (233)
Observations	1,099	

Conclusion

If indeed “political information is to democratic politics what money is to economics; it is the currency of citizenship” (Delli Carpini & Keeter, 1996, p. 8) then democracies seem to be in trouble because citizens generally do not live up to the ideals of democracy. Misperceptions about basic, politically relevant facts appear pervasive and exist on multiple topics. Such tendencies are not just found in the context of the US, where partisan polarization has reached new heights (Mason, 2018), but have been documented in many other countries as well. Moreover, to the extent that incorrect beliefs can be corrected, they do not appear to alter underlying attitudes sufficiently. In fact, even in the presence of incentives to be more accuracy-minded, tendencies toward belief perseverance persist (Peterson & Iyengar, 2021). Consequently, there are reasons to be pessimistic about the future of even mature democracies; when ordinary citizens do not seem able to separate fact from fiction, it becomes challenging to hold politicians accountable (Achen & Bartels, 2017).

The chapter discussed the tension between quick and systematic thinking, and how it relates to knowledge resistance. Humans are arguably highly selective in how they spend their cognitive resources, yet there is a lively scientific discussion about the factors that make people engage in more accuracy-driven processing. Given that directional motivated reasoning is conditional on an array of different factors, it might be premature to conclude that citizens are nearly prisoners of motivated reasoning tendencies without more fully taking stock and exploring scope conditions. Thus, while there is no denying that people often misunderstand basic facts and that these are harmful tendencies toward knowledge resistance, the bleak picture might not be entirely justified.

To get a more fine-grained understanding of the relative prevalence of misperceptions, one useful approach could be to draw more on considerations and ambivalence research. These memory-based approaches to revealing preferences have been criticized for ignoring automatic processes, but they could nonetheless help us to better understand the relative balance of the stated considerations that people have in terms of a) perceived facts versus other types of considerations such as those which are value-based, b) the for versus against considerations, and c) accurate versus inaccurate perceived facts. It is the latter aspect that has the most promise, because it incorporates research on misperceptions, and makes a distinction that research on considerations and ambivalence would benefit from making more central.

The chapter’s brief empirical illustration of this approach is based on a nuclear power referendum survey from Sweden in 1980. It indicates that people often base their attitudes on perceived facts rather than broader, value-based reasons. Moreover, the reasons tend to be accurate rather than inaccurate. Naturally, there are caveats around these findings, yet they indicate that accurate facts sometimes matter greatly in the type of considerations people evoke. To the extent that such tendencies are present on the politicized issues in today’s high-choice media

environment is an empirical question that needs more work. The considerations framework provides one way to delve deeper into this issue.

Several other areas hold promise for fascinating future work. One particularly pressing need for more research concerns the moderating effects of cognitive sophistication, where much political science research indicates that it is associated with stronger tendencies of directional motivated reasoning, perhaps because people use their cognitive resources to further this goal (Taber & Lodge, 2006). However, using a different empirical approach, recent psychological research indicates that these tendencies have been exaggerated and that cognitively sophisticated people actually engage in more systematic and accuracy-focused thinking (Pennycook & Rand, 2019; Tappin et al., 2020). A better understanding of this issue would not only speak to the nature of dual-process models, but also help adjudicate whether political sophistication is a double-edged sword or not.

As stated previously, the prevailing view among those who study public opinion and political behavior is that ordinary citizens are best portrayed as cognitive misers who rarely engage in anything but directional motivated reasoning. Based on this understanding, it is not far-fetched to conclude that the very survival of democratic rule is at stake. There are of course many horrifying examples of how states are undermined from within with the erosion of democratic norms (Levitsky & Ziblatt, 2018), but a notable empirical regularity is how resilient democracies are once they have developed functioning institutions (Cornell et al., 2020). Once these institutions are in place, societies seem able to weather even gale-force levels of knowledge resistance. In fact, if we take the long view of humanity, some even argue that “the escalator of reason” is partially responsible for the century-long trend toward less violence (Pinker, 2012), indicating that reason is not in such a short supply after all.

Notes

- 1 As an example, a “very likely” outcome has a 90–100% probability of happening whereas an “unlikely” outcome is associated with a 0–33% likelihood.
- 2 This study focuses on issues that presumably call attention to the classic left-right economic ideological dimension and not issues that are more about the interpretation of factual information (e.g. climate change, vaccines), it is possible that value-based concerns are more likely to be evoked in such an issue domain.
- 3 In my coding, only specific reasons associated with verifiable facts belong to this category. Thus, a broad reason like “the risks associated with nuclear power are greater than the risks associated with other energy sources” does not belong to this category since it is too broad to be verifiable, and coded as other instead.
- 4 Still, the trend is robust to other sample compositions, like when the focus is only on those who gave four reasons.
- 5 Research assistants in the 1980s had coded the open-ended responses into nearly 100 different categories. Relying on the understanding of the science at the time, I coded these considerations as either correct or incorrect. For example, a statement that oil is more harmful than nuclear power was coded as correct due to the well-known effects of pollution from fossil fuel. In this case, climate change could not factor into the coding since it had not gotten much attention. The same goes for

the Chernobyl nuclear meltdown, which had not yet happened. An example of an incorrect reason is the statement that nuclear power leads to fascism since there was little evidence that reliance on this type of energy source had caused (or was correlated with) more authoritarian leadership. The coding is available upon request.

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14 Overcoming Knowledge Resistance: A Systematic Review of Experimental Studies

*Michael Ingre, Torun Lindholm
and Jesper Strömbäck*

Introduction

A well-known fact is that people surprisingly often believe in things that are simply not true. For example, the public stance on climate change in the US has become increasingly contentious (Leshner, 2015; van der Linden, 2015), and many believe that vaccination has negative health effects (Larson et al., 2016). Such unfounded beliefs predict a range of maladaptive perceptions and behaviors, including poor health choices, climate change denial, and decreased civic virtue (Grebe & Natrass, 2012; Jolley & Douglas, 2014).

An obvious question then is why people, in this era of information abundance, hold beliefs that contradict reason and rigorous observation. While there is little doubt that humans are capable of rational thinking, research has made clear that we often don't form our beliefs by a rational weighing of evidence and data. Rather, research shows that our perceptions, interpretations, and beliefs about the world are strongly influenced by our previous beliefs, feelings, and personal motives to view the world in one way rather than the other. Thus, people selectively attend to information consistent with their interests or previous beliefs, interpret neutral information or evidence that counter their attitudes in a belief confirming manner, and distort or selectively remember objective facts in a way that support their attitudes and decisions. Hence our reasoning is often motivated by desires to view the world as we expect or want it to be (for an overview, see Kunda, 1999). While modern people thus in principle have access to more knowledge than ever before, our inherent mode of thinking continues to make us susceptible to erroneous conclusions and false beliefs. This type of motivated reasoning is an important factor behind misconceptions that helps explain knowledge resistance.

A key question then is what can be done to make people better at scrutinizing information and avoiding reasoning traps that lead their beliefs astray? One line of research has aimed at developing inoculation strategies to combat erroneous beliefs based on false information. In this paradigm, individuals are exposed to a false piece of information that is then directly refuted, in order to inoculate them into becoming more resistant to such false information (Cook et al., 2017;

van der Linden et al., 2017). Another approach has been to train individuals in a “fake news game”, to make them better understand how misinformation is created and disseminated (Roozenbeek & van der Linden, 2019). Prompting individuals to judge the truthfulness of a claim at first exposure has also been found to reduce the illusory truth effect of false statements that are repeated many times (Brashier et al., 2020).

An important question though is how effective different strategies are for overcoming biased reasoning and beliefs in erroneous information. Against this background, the purpose of this chapter is to review research focusing on cures for knowledge resistance, and more specifically for the rebuttal of available facts based on the best evidence. We will focus on strategies that could be readily applied today by communicators who want their messages to be more robust against fact resistance. We limit our focus to experimental studies where causal links between target variables can be established. Specifically, we focus on published psychological experiments where similar evidence was exposed to all participants, but where the presentation was manipulated in an attempt to reduce knowledge resistance.

Method

In terms of methodology, we began with a systematic review of published psychological literature indexed in the PsychInfo database. In addition to general search terms (see below) we included two specific topics that have been studied in this context: climate change and vaccination. The initial search produced 2,692 hits in the PsychInfo database when limited to studies published before May 1, 2020, using the search criteria below. Cited references of all eligible papers were also screened for inclusion in the review. We used the following search terms:

- “motivated reasoning” OR “ideological reasoning” OR “biased reasoning” OR “reasoning bias” OR “biased assimilation” OR “assimilation bias” OR “confirmation bias” OR “truth bias” OR “illusory truth” OR
- “true OR truth OR fact OR knowledge OR science OR scientific OR information OR climate OR “climate change” OR “global warming” OR vaccine OR vaccination)
 - NEAR/1 (
 - deny OR denied OR denies OR denying OR denial OR denier OR
 - reject OR rejected OR rejects OR rejecting OR rejection OR
 - resist OR resisted OR resists OR resisting OR resistance OR
 - misconception OR misinformation)

All publications were then scanned for *experimental* studies of responses to exposure to new evidence (information, facts, and scientific knowledge). The focus was on communicated facts and general knowledge that should be easy to verify by anyone. Hence the veracity of direct experiences, such as eyewitness reports and decision-making studies, were excluded. In addition, studies

that introduced misinformation first, and later attempted to correct it, were also excluded. To be included in the review, studies should have communicated evidence to participants, applied an experimental manipulation aimed to reduce resistance to accept or reject that evidence, and measured the effect on belief or a belief-dependent attitude/behavior. Studies were however excluded if they were based on children or clinical groups, if the evidence presented to participants was too specific (e.g. about a specific medical diagnosis), or the outcome was of a subjective nature (e.g. support for a politician or a social policy).

In total, 2,692 titles and abstracts were scanned for inclusion and 79 papers were read in full (Table 14.1). Screening of references cited in eligible papers added another 47 publications for a total of 126. Of these, 107 papers were found to not be eligible.¹ After going through the methods of these papers, 27 studies reported in 17 papers were found to be eligible for this review. The studies are summarized in Table 14.1.

Results

The majority of the studies reviewed can be grouped into four broad categories: Framing, argument composition, social learning, and self-affirmation. Following this categorization, we will next present the designs, procedures, and main results of the studies. In the discussion, we will sum up the conclusions that can be drawn from the viewpoint of practical communication settings.

Framing

In general, framing refers to how information is packaged and presented. In this area of research, scholars have mainly focused on the role of worldview framing and gain vs. loss framing.

Worldview Framing

Several studies have used different forms of worldview framing to alter the ways in which a message is presented. The main idea behind this method is that a particular fact may be resisted if the fact itself is threatening, or if the problem it identifies needs a solution that is not acceptable to a person's core values and worldview. To mitigate such fact resistance, it has been suggested that the fact should be framed in a way that makes it compatible with the individual's view of things. Thus, rather than trying to directly combat an attitude that is based on core values and ideologies, the goal here is to yield to those values and use them to trigger change.

In the US, for example, Republicans are generally more skeptical toward science suggesting human-caused climate change than are Democrats. This climate change skepticism has been attributed to various dispositions among conservatives, such as a greater sensitivity to negative information, or a stronger disposition toward motivated cognition. Campbell and Kay (2014) argued that

Table 14.1 Description and main findings of studies included in the review. Studies are listed alphabetically after first author's name

<i>Citation</i>	<i>Number of studies</i>	<i>Participants</i>	<i>Summary of findings</i>	<i>Experimental manipulation</i>
Baesler, E. J., & Burgoon J. K. (1994). The temporal effects of story and statistical evidence on belief change. <i>Communication Research</i> , 21, 582–602. https://doi.org/10.1177/009365094021005002	1 (1)	US undergraduate students, N = 292 (56% women)	Statistical evidence increased beliefs in factors leading to criminality, more than narrative story evidence.	Argument composition
Bayes, R., Druckman, J. N., Goods, A., & Molden, D. C. (2020). When and how different motives can drive motivated political reasoning. <i>Political Psychology</i> , 41, 1031–1052. https://doi.org/10.1111/pops.12663	1 (1)	Self-identified Republicans, N = 1964 (52% women)	Message framing that matched a motivational prime increased belief in climate change.	Motivational focus
Campbell, T. H., & Kay, A. C. (2014). Solution aversion: On the relation between ideology and motivated disbelief. <i>Journal of Personality and Social Psychology</i> , 107, 809–824. http://dx.doi.org/10.1037/a0037963	2 (4)	Study 2: Amazon Mturk participants, N = 121 (69% women), self-identified Democrats (n = 81) and Republicans (n = 40) Study 3: Amazon Mturk participants, N = 120, self-identified Republicans (57% women)	Worldview compatible climate change messages increased belief in climate change.	Worldview framing
Carnahan, D., Bergan, D. E., & Lee, S. (2020). Do corrective effects last? Results from a longitudinal experiment on beliefs toward immigration in the U.S. <i>Political Behavior</i> , 43, 1227–1246. https://doi.org/10.1007/s11109-020-09591-9	1 (1)	Representative US. sample, longitudinal three-wave design, N = 1203, N = 688, N = 414	Repeated corrections of misperceptions resulted in a stable increase in belief accuracy.	Argument composition

(Continued)

Table 14.1 Description and main findings of studies included in the review. Studies are listed alphabetically after first author's name (Continued)

Citation	Number of studies	Participants	Summary of findings	Experimental manipulation
Chen, L., & Unsworth, K. (2019). Cognitive complexity increases climate change beliefs. <i>Journal of Environmental Psychology</i> , 65, 101316. https://doi.org/10.1016/j.jenvp.2019.101316	1 (3)	Australian participants, <i>N</i> = 378 (60% women)	Two-sided arguments made participants with high cognitive complexity increase the belief in climate change.	Argument composition
Cohen, G. L., Aronson, J., & Steele, C. M. (2000). When beliefs yield to evidence: Reducing biased evaluation by affirming the self. <i>Personality and Social Psychology Bulletin</i> , 26, 1151–1164. http://dx.doi.org/10.1177/01461672002611011	3 (3)	Study 1: US undergraduate students: <i>N</i> = 77 (53% women) Study 2: US undergraduate students, <i>N</i> = 82 (43% women) Study 3: US undergraduate students, <i>N</i> = 64 (53% women)	Self-affirmation improved assimilation of counter-attitudinal information, and reduced polarization when exposed to mixed arguments.	Self-affirmation
Dieckmann, N. F., Gregory, R., Peters, E., & Hartman, R. (2017). Seeing what you want to see: How imprecise uncertainty ranges enhance motivated reasoning. <i>Risk Analysis</i> , 37, 471–486. http://dx.doi.org/10.1111/risa.12639	1 (2)	Study 2: Decision Research web panel subject pool, <i>N</i> = 216 (64% women)	Supplementing reports of uncertainty ranges with a figure reduced biased interpretation of ranges.	Clarifying visual aid
Feinberg, M., & Willer, R. (2011). Apocalypse soon? Dire messages reduce belief in global warming by contradicting just-world beliefs. <i>Psychological Science</i> , 22, 34–38. https://doi.org/10.1177/0956797610391911	2 (2)	Study 1: US undergraduate students, <i>N</i> = 97 (74% women) Study 2: US participants from 15 cities, <i>N</i> = 45 (76% women)	The greater participants' belief in a just world, the more skeptical they became about global warming when exposed to a dire message, while a positive message led to increases in reported belief in global warming.	Worldview framing

(Continued)

Table 14.1 Description and main findings of studies included in the review. Studies are listed alphabetically after first author's name (Continued)

Citation	Number of studies	Participants	Summary of findings	Experimental manipulation
Guilbeault, D., Becker, J., & Centola, D. (2018). Social learning and partisan bias in the interpretation of climate trends. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 115, 9714–9719. http://dx.doi.org/10.1073/pnas.1722664115	1 (1)	Amazon Mturk participants $N = 2,400$, 50% self-identified Democrats and 50% Republicans (50% women)	Feedback from peers in a social network reduced biased interpretation of a climate change trend in a neutral, but not in a partisan setting.	Social learning
Johnson, D. R. (2017a). Bridging the political divide: Highlighting explanatory power mitigates biased evaluation of climate arguments. <i>Journal of Environmental Psychology</i> , 51, 248–255. http://dx.doi.org/10.1016/j.jenvp.2017.04.008	2 (2)	Study 1: Amazon Mturk US. participants, $N = 228$, 50% self-identified Republicans and 50% Democrats (56% women) Study 2: Amazon Mturk US. participants $N = 240$, 50% Republicans and 50% Democrats (55% women)	Asking subjects to focus on explanatory power reduced the convincingness of anti-climate change arguments and increased the belief in pro-climate change arguments.	Argument composition
Johnson, D. R. (2017b). Improving skeptics' reasoning when evaluating climate change material: A cognitive intervention. <i>Ecopsychology</i> , 9, 130–142. https://doi.org/10.1089/eco.2017.0012	2 (2)	Study 1: Amazon Mturk US. participants, self-identified climate change deniers, $N = 170$ (40% women) Study 2: Amazon Mturk US. participants, self-identified climate change deniers, $N = 335$ (46% women) Study 3: Amazon Mturk US. participants, self-identified climate change deniers, $N = 167$ (53% women)	Asking self-identified climate change deniers to focus on explanatory power, increased their belief in climate change after being presented with pro- and anti-climate change arguments.	Argument composition

(Continued)

Table 14.1 Description and main findings of studies included in the review. Studies are listed alphabetically after first author's name (Continued)

Citation	Number of studies	Participants	Summary of findings	Experimental manipulation
Kahan, D. M., Jenkins-Smith, H., Tarantola, T., Silva, C. L., & Braman, D. (2015). Geoengineering and climate change polarization: Testing a two-channel model of science communication. <i>Annals of the American Academy of Political and Social Science</i> , 658, 192–222. http://dx.doi.org/10.1177/0002716214559002	1 (1)	Population-based US ($N = 1,500$) and UK ($N = 1,500$) sample	Worldview compatible climate change messages increased belief in climate change.	Worldview framing
Morton, T. A., Rabinovich, A., Marshall, D., & Bretschneider, P. (2011). The future that may (or may not) come: How framing changes responses to uncertainty in climate change communications. <i>Global Environmental Change</i> , 21, 103–109. https://doi.org/10.1016/j.gloenvcha.2010.09.013	2 (2)	Study 1: UK participants recruited from social networking sites, $N = 88$ (66% women) Study 2: UK university students, $N = 120$ (59% women)	Positive framing and high uncertainty increased behavioral intentions.	Gain/loss framing
Munro, G. D., & Stansbury, J. A. (2009). The dark side of self-affirmation: Confirmation bias and illusory correlation in response to threatening information. <i>Personality and Social Psychology Bulletin</i> , 35, 1143–1153. http://dx.doi.org/10.1177/0146167209337163	1 (2)	Study 2: US undergraduate students, $N = 107$	Affirming the self-reduced accuracy of interpretations of statistical information when a threatening hypothesis was tested.	Self-affirmation
Rich, P. R., Van Loon, M. H., Dunlosky, J., & Zaragoza, M. S. (2017). Belief in corrective feedback for common misconceptions: Implications for knowledge revision. <i>Journal of Experimental Psychology: Learning, Memory, and Cognition</i> , 43, 492–501. http://dx.doi.org/10.1037/xlm0000322	2 (2)	Study 1: US undergraduate students, $N = 62$ (77% women) Study 2: US undergraduate students, $N = 48$ (69% women)	Adding an explanation to refutations of preexisting misconceptions increased the chance the misconception was corrected.	Argument composition

(Continued)

Table 14.1 Description and main findings of studies included in the review. Studies are listed alphabetically after first author's name (*Continued*)

<i>Citation</i>	<i>Number of studies</i>	<i>Participants</i>	<i>Summary of findings</i>	<i>Experimental manipulation</i>
Sherman, D. A. K., Nelson, L. D., & Steele, C. M. (2000). Do messages about health risks threaten the self? Increasing the acceptance of threatening health messages via self-affirmation. <i>Personality and Social Psychology Bulletin</i> , 26, 1046–1058. http://dx.doi.org/10.1177/01461672002611003	2 (2)	Study 1: Women US undergraduate students, <i>N</i> = 60 Study 2: US undergraduate students, <i>N</i> = 61 (50% women)	Affirming the self-improved participants acceptance of relevant medical information.	Self-affirmation
Spence, A., & Pidgeon, N. (2010). Framing and communicating climate change: The effects of distance and outcome frame manipulations. <i>Global Environmental Change</i> , 20, 656–667. https://doi.org/10.1016/j.gloenvcha.2010.07.002	1 (1)	UK psychology students, <i>N</i> = 161 (86% women)	Framing climate change mitigation in terms of gains rather than losses increased attitude toward climate change.	Gain/loss framing

a more parsimonious explanation to the ideological divide on climate change could be the incompatibility between the suggested solutions to the climate problem and Republican ideology. The most commonly proposed solutions to climate change have been different forms of restrictive governmental policies, counter to core Republican beliefs in free market and limited government regulation. In one article, Campbell and Kay therefore investigated whether political polarization on climate change could be mitigated by alternating the proposed solutions to the problem. In one study, Democrat and Republican participants read quotes from a speech on climate change, citing statistics from a scientific panel on the topic. Participants were then randomized to read about one of two policy solutions to climate change. In the government regulation condition, the suggestion was a restrictive emission policy that contradicted core beliefs of many Republicans. In the free market-friendly condition, the solution emphasized how the US could profit from green technology, which is compatible both with Republican and Democrat ideologies. The results showed that the free market vs. government regulation condition increased belief in climate change science, as well as in human causation among both Democrats and Republicans. Importantly, the increase in the free market-friendly condition was stronger for Republicans than Democrats. A follow-up study examined whether the degree of faith in the free market affected views on suggested solutions to human-caused pollution. Republican participants rated the strength of their free market ideology, and then read a blog post about a solution to air pollution that was either government regulation- or free market-friendly. Participants were then presented with statistics on the large number of people exposed to unhealthy air pollution in the US and rated their agreement with the statistic and their belief in climate change science. The results showed that strong beliefs in the free market were associated with less agreement that pollution was a health problem in the government regulation friendly, but not in the free market condition. These results support the notion that skepticism toward politically polarized issues may be rooted in the implications that the solutions hold for an individual's ideology or worldview, rather than in a general tendency for certain groups to dislike science or deny catastrophe.

Similarly, Kahan et al. (2015) suggested that the acceptance of a scientific claim may not be determined by the claimed fact in itself, but rather by whether the fact is interpreted as consistent with the individual's cultural worldview. In this study, participants differing in their cultural worldviews were recruited; those high in hierarchy/individualism who are generally dismissive of climate change claims that could justify industry and commerce restrictions, and egalitarian/communitarian individuals who see commerce and industry as sources of unfairness, and more readily accept that these activities should be restricted. Participants were randomized to read one of three news articles: an anti-pollution article calling for stricter levels on CO² emissions, signifying the dangers of commerce and industry, an article on an innovative technology, geoengineering, as a solution to increasing CO² levels, thus valorizing the use of human ingenuity to overcome the limits on commerce and industry, or a neutral article.

Next, participants read an excerpt of a scientific article presenting evidence that climate change is much worse than previously assumed, and after reading they rated the study's validity and their belief in climate change risks. As expected, the results showed a main effect of participants' world view, with those high in hierarchy/individualism generally assigning lower validity to the scientific study, and lower belief in climate change risk than egalitarians/communitarians. Importantly, however, this main effect was moderated by experimental conditions. Thus, ratings of the validity of the scientific text, and beliefs in climate change risk, was highest for egalitarian-communitarian participants after reading the article calling for the restriction of CO₂ emissions, whereas for hierarchical/individualists, ratings were highest after reading the geo-engineering article. The findings are interpreted within a two-channel communication framework, where Channel 1 focuses on information content, and Channel 2 focuses on the meaning attributed to the information – whether the fact is interpreted as consistent or not with the individual's worldview. The authors conclude that to be effective, communicators need not only furnish people with valid information, but also present the cues necessary to assure individuals the information is acceptable from their preferred view of how society should be organized.

A different type of worldview framing was used in a study by Feinberg and Willer (2011). People are usually comforted by believing that they live in a just, stable, and orderly world, where rewards come to those who have strived for them and punishments to those deserving these (Lerner, 1980). When people's need to believe in a just world is threatened, they often employ defensive responses, such as dismissing threatening information. Feinberg and Willer (2011) suggested that information about the arbitrary and severe effects of global warming may constitute a threat to such just-world beliefs, and that a reaction to this threat could be to deny global warming and decrease willingness to counteract it. In the first experiment, they examined how the framing of climate change information interacted with just-world beliefs to predict climate skepticism and willingness to reduce carbon emissions. Participants' views on global warming and their just-world beliefs were first measured in a separate session. Two weeks later, they came back and read a news article by a scientific panel providing information about climate change. In the *dire* condition, the two last paragraphs of the article detailed the devastation and the possibly apocalyptic consequences that could result from global warming. In the *positive* condition, the last two paragraphs pointed toward existing technical solutions that can solve climate problems before it is too late. Participants in the positive condition generally increased their belief in climate change. In the *dire* condition, participants with a strong belief in a just world increased in skepticism whereas those with low just-world beliefs increased belief in climate change. In a second study, participants watched a *dire* climate change video after being primed by statements describing a fair and just world, or with statements describing an unfair and unpredictable world. The priming intervention aimed at making salient either just-world beliefs, or thoughts counter to such beliefs. Participants primed with just-world statements reported higher levels of global-warming skepticism than did those

who were primed with unjust-world statements. This suggests that dire messages warning of the severity of global warming and its presumed dangers can backfire, paradoxically increasing skepticism about global warming by contradicting individuals' deeply held beliefs that the world is fundamentally just.

Gain vs. Loss Framing

A well-established finding in decision-making research is that the subjective value people attribute to losses typically is higher than the subjective value of an equivalent gain. To illustrate, losing 100 SEK is not compensated by gaining the exact same sum, but rather by gaining 200 SEK. This means that people often react differently to problems presented in positive vs. negative terms. For example, when a problem is framed in terms of losses (e.g. lives lost), people become more likely to prefer a risky solution that leads to lower expected utility as long as it has the potential to avoid losses. When the equivalent problem is framed in terms of gains (e.g. lives saved), preferences tend to be risk-averse, such that people choose options that lead to a lower gain but with higher certainty (Tversky & Kahneman, 1981; Tversky & Shafir, 1992).

Against this background, Morton et al. (2011) set out to test if gain/loss frame manipulations in the communication of climate change could be used to increase people's intention for pro-environmental behavior. The authors argued that choosing not to act in the face of possible climate change could be interpreted as a risky behavior. Given that framing in terms of losses tends to increase preferences for risky solutions whereas gain frames are associated with risk-aversion, such inaction may be most pronounced when messages on climate change highlight the negative consequences (possible losses). If climate change communication is framed by focusing on how negative consequences could be avoided, people may be inclined to prefer caution and show stronger intentions to behave environmentally. These differences due to message framing could also be expected to amplify the more uncertainty the message expresses. In their study, Morton et al. presented participants with messages about climate change either stating the probability of certain negative effects of climate change (e.g. "It is 80% likely that global warming will cause abrupt and severe changes to regional weather patterns..."), or the probability that these effects would not happen (e.g. "It is 20% likely that global warming will not cause abrupt and severe changes to regional weather patterns..."). The level of uncertainty varied, where low uncertainty expressed the likelihood by a single figure (e.g. 80%) and high uncertainty with a percentage range (e.g. 70–90%). The results showed that with highly uncertain predictions, the positive frame led to higher intentions to behave pro-environmentally than the negative frame, while framing had no effects on intended behavior in the low uncertainty condition. These results were replicated in a second study. This study also showed that participants' higher intentions to act pro-environmentally when high uncertainty was framed in positive terms, was mediated by a higher perceived efficacy in this condition, that is, a belief that actions against climate change would be effective

in countering it. The authors suggest that a focus on the negative impacts of climate change is likely to leave people feeling as though they might as well “take a chance” rather than act with caution. Reframing this message to emphasize the losses that may not occur might instead elicit caution and a willingness to act in ways that avoid a negative future.

Spence and Pidgeon (2010) also examined the effects of gain vs. loss framing in climate change communication. As Morton et al. (2011), they argued that people may be more risk-seeking when the problem is communicated in a loss frame (e.g. in terms of the negative consequences that might happen if nothing is done), while more prone to risk-aversion when climate change is discussed in a gain frame (e.g. the positive consequences of taking action). They also varied the personal relevance of the problem, by describing how climate change may cause flooding in a location either close or distant to participants’ home area. In line with Morton et al. (2011), the results showed that informing people on climate change impacts using a gain frame resulted in higher perceived severity of climate impact and more positive attitudes toward climate change mitigation compared to the loss frame. In addition, participants in the gain vs. loss frame condition reported less fear-related emotions. Perceived severity of climate change decreased when the effects were shown in a local rather than in a distant area. The authors interpret this somewhat surprising finding as an effect of a general tendency to view distant impacts of climate change as more serious than local impacts. All other things being equal, a general conclusion then is thus that communications promoting climate change mitigation should focus on what can be gained by mitigation efforts rather than dwelling on the potential negative impacts of not taking action.

Other Types of Framing

A large literature has demonstrated the influence of motivated reasoning in responses to political messages. Bayes et al. (2020), for example, argued that the persuasiveness of a message could be conditioned on whether the particular message matches the individual’s specific motivation in a given situation. Motivations were grouped into three categories: (1) forming an accurate impression; (2) affirming moral values; and (3) affirming group identity. In the study, they examined how an experimental activation of any of these motivations affected the influence of different types of messages about climate change. Republican participants were first randomized into four different prime conditions: a no-motivation condition with no additional instructions, an accuracy prime, a value threat prime, or a group-identity threat prime. The accuracy prime instructed participants to be evenhanded when reading the text that would be presented, and that they should explain how they arrived at their answers to the questions that followed. For the two latter groups, the primes first asked questions that made the political identity salient, and then asked either to which degree they agreed that the Republican party has strayed from their core values (value threat) or that the party is falling apart and lack consensus (group identity

threat). Participants were then randomized to read messages with one of three different frames: a *detailed information frame* citing a national scientific report on human-caused climate change, a *moral values frame* stating that climate change will destroy the sanctity of the pristine environment, making it everyone's patriotic duty to combat climate change, and a *norms frame* stating that, contrary to popular belief, most republicans agree with climate change science. The authors hypothesized that the message would have a greater effect when the message frame matched the priming condition. Hence, the accuracy prime combined with detailed information, the value prime combined with moral values frame, and identity prime and norms frame were expected to produce a higher increase in climate change beliefs than with the other combinations. The result generally supported the hypothesis. The authors suggest that the results offer two potential explanations to why the framing of a message may fail to produce the desired effect: it may be that the required motivation did not exist at sufficiently high levels for the message to have an effect or, the messages may not have been precise enough to tap into the motivation that was present.

Argument Composition

Turning to argument composition, several studies have investigated how the composition of an argument regarding a polarized issue affect biased interpretations. According to Johnson (2017a, 2017b), arguments can be distinguished into strong mechanistic ones with high explanatory power, showing how "A leads to D, in a step-by-step manner, with causally connected points from A to B to C to D", and weak arguments with low explanatory power, often circular in nature. In two studies (2017a), participants were instructed to focus on the explanatory power of messages on climate change. In the first study, participants identified as Republicans or Democrats rated the convincingness of two anti-climate change scientific explanations that were circular in nature, hence had low explanatory power. In one group, participants were asked to carefully and thoughtfully evaluate the arguments. In the other group, participants were asked to focus on explanatory power, specifically how well the argument explained how the main point leads to the main outcome. The results showed that focusing on explanatory power reduced the convincingness of the anti-climate change argument, especially for Republicans, who in the careful focus group rated the argument more convincing than Democrats. In a second study, Republicans and Democrats rated two pro-environment arguments with high mechanistic explanatory power that encouraged action against climate change. Instructions of explanatory focus increased the rated quality of the pro-environment arguments. An interaction showed that this increase was largest for Republicans, who in the careful focus group rated the quality lower than Democrats.

Three additional studies by Johnson (2017b) recruited climate change skeptics. In all three studies, participants' agreement with statements suggesting human-caused climate changes were first measured, after which they were randomized

into a careful focus or explanatory power condition similar to above. Across the studies, participants' climate change agreement was also measured after the experiment. In study 1, a focus on explanatory power increased rated quality and convincingness of pro-climate change arguments with high explanatory power and lowered the rated quality and convincingness of anti-climate change arguments with low explanatory power. In study 2, policy arguments with moderate and high explanatory power were formulated, either arguing that new energy-efficient standards would lead to job loss (anti-climate change) or that the same standards would create jobs (pro-climate change). Results indicated that skeptics generally rated anti-climate change arguments higher. However, when arguments were high in explanatory power, these participants rated anti- and pro-climate change arguments as similarly useful. In a third study, climate skeptics were exposed to two different pro-environmental arguments with high explanatory power, one focusing on economic opportunity and the other on community building. The findings show that a focus on explanatory power increased the perceived convincingness of the arguments and pro-environmental intentions compared to the careful focus condition. In all three studies, there was furthermore an increased acceptance of human-caused climate change from pre- to post-measures, regardless of experimental condition, suggesting that reading mechanistic scientific explanations can cause attitude change. The effects generalized across judgements of scientific explanations, policy argument, and pro-environmental behavior arguments.

Rational decision-making suggests that claims based on aggregated numbers should be more believable than claims based on a single report. However, many studies comparing the persuasiveness of a case story (e.g. the description of the social situation of one individual P) vs. statistics (e.g. showing the situation for the entire population to which P belongs) show that case reports often are more persuasive. One explanation to the persuasive advantage of case reports is that they are more emotionally interesting, concrete and imagery provoking. In an effort to disentangle the effects of evidence type and vividness, Baesler and Burgoon (1994) conducted a study in which they manipulated vividness in both statistics and in a case report regarding the relation between juvenile delinquency and criminality. They also examined time effects in the persuasiveness of different types of evidence, by measuring participants' beliefs at short-term and long-term delays. Participants in the study were presented with written evidence by a lawyer arguing that most juvenile delinquencies do not lead to criminality. The message either provided a narrative about a single person, Bob, or a statistic on the number of juvenile delinquents that did not grow up to be criminals. Vividness was manipulated by adding concrete factors (e.g. divorced parents, lack of role models) for both types of evidence. After one week, only the group exposed to vivid statistical evidence had stronger beliefs in the claimed relation than a control group. Hence, it appears that the persuasiveness of statistical evidence can be enhanced by reinforcing it with imaginative and concrete language, and that for long-term effects on beliefs, this is the most effective way of communication.

Correcting people's misconceptions of facts can be difficult, and research has focused on identifying effective correction techniques. A correction technique that has been found to work well is to use refutation texts, which directly negate a person's misconception, provides the correct answer, and a supporting explanation. To clarify the processes behind the efficiency of this technique, Rich et al. (2017) examined how participants' revision of a misconception was related to their belief in the correct answer, and how this belief, in turn, depended on receiving an explanation supporting the refutation. Participants stated the truthfulness of common misconceptions, with false statements (e.g. "bulls are enraged by the color red") mixed with true statements (e.g. "the Sahara desert is mostly rocky plateaus"). After answering the questions, participants in a control group received only feedback that their responses were correct or incorrect. Participants in the experimental group also received a short explanation (e.g. "Bulls are unable to see the color red. Bulls are instead enraged by the matador who is perceived as a threat", and "A majority of the Sahara desert consists of rocky plateaus with little sand, caused by the winds which gather the sand into the dunes the desert is famous for"). Both groups then rated their belief in the feedback. A week later, participants returned to the laboratory to respond to the same misconceptions. The group that received a refutation together with an explanation performed better on the task than the group that only received a refutation. Moreover, the increased accuracy in the refutation-explanation group was mediated by a stronger belief in the corrective feedback. This suggests that refutations are effective mainly when the feedback is believed, and an explanation to a refutation counteracts low belief in the feedback.

In a related vein, Carnahan et al. (2020), examined long-term effects of corrections of misperceptions using a longitudinal three-wave (two weeks in between) design. In Wave 1, participants were randomized into either a control condition or to fact-check conditions that provided corrections to common misperceptions regarding undocumented immigration in the US. For half of the participants, the correction message involved a "myth-fact" format presenting common misperceptions along with the corrective information, whereas the other half were presented with corrective information without also presenting the false statements. Both correction messages were formatted to appear as taken from well-known fact-checking sites. As there were no differences in the effects of different correction message forms, the two forms were pooled to one variable in the analyses. In Wave 2, participants were again randomized to conditions, with the restriction that participants who in Wave 1 received one of the correction messages did not receive the same correction in Wave 2. Hence, participants either received one, two, or no correction across the three waves. The accuracy of participants' beliefs regarding a set of claims about immigration in the US was assessed after the correction or control information in Waves 1 and 2, and a final time in Wave 3. The results showed an immediate effect for corrective messages, such that exposure to a correction in Wave 1 or Wave 2 resulted in increased belief accuracy as measured directly after the corrections. The effect of a single correction message at Wave 1 persisted across a two-week delay to

Wave 2, while substantially smaller than the immediate effect. In Wave 2, there was also an additive effect of repeated exposure, such that belief accuracy was highest for participants receiving corrective messages at both Waves 1 and 2. In Wave 3, significant improvements in belief accuracy were detectable only among participants receiving corrective messages at both Waves 1 and 2. This study offers evidence that corrective effects can show stability over time, such that with repetition, improvements in belief accuracy in response to corrective information can remain for several weeks.

Chen and Unsworth (2019) investigated how an individual's level of *cognitive complexity*, how complexly or simply the individual tends to think about a particular issue, may interact with different types of arguments regarding climate change. In two studies, they first demonstrated that individuals with lower levels of cognitive complexity are less likely to believe in human-caused climate change. In a third study, they investigated reactions to different types of arguments on climate change across people differing in cognitive complexity. Specifically, they presented participants high or low in cognitive complexity with either one- or two-sided arguments on the topic of climate change. In the one-sided argument condition, participants saw 16 arguments confirming the existence of anthropogenic climate change. In the two-sided arguments condition, participants saw 16 arguments confirming the existence of climate change paired with arguments denying climate change. Confirming the first studies, the results showed a positive relation between cognitive complexity and belief in human-caused climate change. Those scoring high in cognitive complexity benefited from the two-sided arguments and scored higher in climate change belief than those reading one-sided arguments. In contrast, lower cognitive complexity participants tended to score higher in beliefs in climate change in the one-sided argument condition. The results suggest that different forms of arguments are required depending on the audience.

Social Learning

Science communication is often filtered through peer-to-peer networks, both in direct interactions and on social media. These networks not only function as pathways for diffusing information, but also help to shape how people interpret the information. In the US, a concerning trend is that conservatives and liberals increasingly discuss topics as climate change within politically homogeneous “echo chambers”, where partisan bias is reinforced through repeated interactions among like-minded (but see Garrett, 2017). Against that context, Guilbeault, Becker, and Centola (2018) examined whether exposure to opposing beliefs in a bipartisan network might facilitate social learning and reduce partisan bias in interpretations of climate trends. In the study, participants were organized into social networks that gave feedback on interpretations of a climate change trend showing a declining amount of arctic ice between 1980 and 2012. The long-term trend was clearly decreasing but the short-term trend from the two last observations was increasing. Participants were asked to predict the amount

of ice in 2025. They got three attempts, and after each attempt, they were able to revise their estimate. In round 1, participants in all conditions provided an independent estimate. In rounds 2 and 3, control participants were permitted to revise their answers without any feedback about their peers' judgements. In the neutral condition, participants were only shown the average answers of their network peers. For participants in the network with minimal partisan priming, the logos of the Democratic and Republican parties appeared below the group average, and in the network condition with political identity revealed, participants were shown the political ideologies of the network peers. The results showed that self-identified conservatives performed worse than liberals in general. There was an overall improvement in accuracy over the three attempts, and this improvement was largest for conservatives. In the neutral social feedback condition, this improvement across trials erased the difference between conservatives and liberals. However, in the conditions with partisan cues, either as logos or political identity, the improvement was hampered. The results suggest that politically diverse communication networks can indeed reduce partisan bias in the interpretation of polarized topics. However, increasing the salience of partisanship even minimally reduces social learning and belief polarization can be sustained.

Self-affirmation

Also important to take into consideration is that people want to maintain an overall good self-image of moral and adaptive adequacy. Beliefs can constitute valued sources of identity, and may therefore be embraced even when they conflict the demands of fact and logic (Steele et al. 1988). Evidence that challenges the validity of such cherished beliefs presents a threat to the self since giving up the belief would entail losing a source of self-esteem or identity. However, people have flexibility in how to cope with a particular self-threat. Self-worth can be reaffirmed directly by defensively scrutinizing the threatening evidence, or indirectly, by affirming other valued domains of self-worth. Hence, when people have the opportunity to affirm their self-worth before being exposed to threatening information, they may have less need to affirm their worth by resisting or misinterpreting new information to fit their self-image. Three studies included in this review investigated the effect of affirming the self on the ability to accept new, potentially threatening evidence.

In three experiments by Cohen et al. (2000), participants first self-affirmed either by writing a short essay about experiences that had made them feel good about themselves (Studies 1 and 3), or by getting positive feedback on a bogus test of their ability to interpret other people's thoughts and feelings (Study 2). In Study 1 and 2, participants, who were either proponents or opponents to capital punishment, were assigned to the affirmation or no-affirmation condition before reading a scientific report on capital punishment. The report presented evidence in favor of capital punishment to opponent participants and against it to proponents. The results in both studies showed that self-affirmed participants

rated the presented (counter-attitudinal) evidence more favorable than the non-affirmed group. In Study 2, the self-affirmed participants also showed more change in their attitude in the direction of the evidence they had read. In Study 3, participants were either in support of abortion rights for women or against the right of abortion. They were presented with mixed evidence in the form of a debate transcript between a pro-life and a pro-choice advocate. In this study, self-affirmation reduced participants' bias in favor of the attitude confirming advocate, who was rated less favorably by affirmed participants. Hence, whereas affirmed participants in Study 1 and 2 showed less negative bias in their ratings of a counter-attitudinal report, those in Study 3 rather attenuated their positive bias toward the advocate sharing their own view. The authors conclude that shoring up global self-worth seems to take the sting out of new ideas, making them less painful to accept as true.

One obstacle for health campaigns aimed at reducing disease or illness is that individuals often are motivated to interpret information in a self-serving way that may prevent them from accepting the risk for disease. One explanation to this phenomenon is that people respond defensively to threatening health information as a means of maintaining a positive self-image. In two studies, Sherman et al. (2000), investigated the role of self-affirmation in acceptance of a personally relevant health message. In Study 1, female coffee drinkers and non-coffee drinkers were recruited and read an article linking coffee to cancer in women. Before reading the article, participants ranked a list of values (e.g. religion, aesthetics) in order of personal importance. They next read the article linking coffee-drinking to cancer, before being presented with a set of statements that they should rate their agreement with. In the self-affirmation group, half of the statements were associated with each participants' most important value, a procedure aimed at affirming the self by making salient values that were central to the individual's self-image. In the no-affirmation group, half of the statements concerned participants' least important value. Findings showed that in the no-affirmation condition, coffee drinkers were less accepting of threatening information than non-coffee drinkers. However, affirmed coffee drinkers accepted the information more than non-drinkers. In the second study, sexually active men and women were recruited to see a potentially threatening AIDS educational video. Before viewing the video, participants again ranked a list of values and personal characteristics (e.g. athletics, artistic skills, creativity) in order of importance. Self-affirmed participants then wrote an essay describing why their highest ranked value was important to them, and a time when it had been particularly important. The no-affirmation group wrote an essay describing why a value they ranked low would be important for the average student. Results showed that affirmed participants saw themselves as being at more serious risk for HIV than did non-affirmed participants. More often they purchased condoms after the experiment, and took an educational AIDS brochure with them. The authors concluded that whereas health messages can be threatening to a person's self-image leading to a rejection of the

message, with the self-image bolstered, the health message can become less threatening and the individual more accepting of the health message.

The self-affirmation studies reviewed above have framed the situation when people dismiss threatening information as a problem. This framing assumes that the information presented to people is true, or at least of high quality. However, Munro and Stansbury (2009) pointed out that threatening information need not always be valid, and when it is not, a skeptical, non-affirmed mindset might actually lead to more accurate conclusions. To investigate this, in one of their studies participants first rank ordered values according to personal importance. As in the earlier discussed studies, affirmed participants then wrote about a time when their most important value had proved meaningful, while non-affirmed participants described the importance of a low ranked value to the average student. Next, they completed a bogus personality test on individualism. They scored their test themselves and were hence aware of their personal score (high or low in individualism). Next, they read about a fictitious research project on the relation between individualism and romantic relationships. In different conditions, participants were told that the project predicted either that high or low individualism would be a hindrance to such relationships. Since about half of the participants had scored high, and the other half low in individualism, this meant that the prediction was threatening to half of the participants and non-threatening for the others. Participants were then shown a 2 X 2 table with the results of the project, indicating the number of persons high and low in individualism who had successful and failed relationships. They were asked to indicate what the table showed about the likelihood for persons high or low in individualism (depending on which prediction they had seen) to end up with romantic failures. The table in fact showed zero correlation between individualism and relationship success. The results showed that the non-affirmed, threatened participants were better than the affirmed group and the non-threatened participants at spotting the lack of relationship in the table. Moreover, it was found that the higher accuracy in the non-affirmed, threatened group was due to a higher proportion of these participants realizing that all cells in the table were necessary to assess the relation. Hence, consistent with past research, self-affirmation did increase participants' openness to accept a hypothesis suggested by research. However, in this study the suggested hypothesis was false, and self-affirmation resulted in failing to identify this. The results support models of motivated reasoning that propose that information processing is altered in response to threatening information. By ameliorating the threat, self-affirmations can elicit less effective reasoning strategies.

Other Effects

Many forecasts, be it about personal health, economics, or environment, are clouded with uncertainty. One important element of uncertainty representations is how people interpret the relative likelihood of different values in a given stated range. For example, given the forecast that global temperatures will increase

between 1° and 5° over the next century, people may assume that the distribution is normal, with values in the middle of the range being more likely than values at the endpoint. The ranges can also be interpreted as uniform, where all values are equally likely, or skewed in one direction or another. Which of these estimates is correct varies, but in most situations, distributions are roughly normal or uniform. Importantly, people's interpretations regarding distributions of values in a given situation can influence judgments and decisions. For example, given the global temperatures forecast, believing that a 5° increase is just as likely than anything else (a uniform interpretation), will lead to very different beliefs of risks than if the distribution is interpreted to be roughly normal, in which a 5° increase has a very low probability.

Against this background, Dieckmann et al. (2017) investigated how motivational biases may affect interpretations of the underlying distribution of an uncertainty range, and how such biases can be countered. Participants were presented with a forecast from experts either on a neutral topic that should not trigger motivational biases, or on topics expected to activate motivated reasoning; a climate change forecast predicting higher temperature increases than previously expected and a forecast on how concealed gun laws would decrease sexual assaults. For each topic, an uncertainty range around the estimate was provided. In the temperature forecast, uncertainty ranged between 1° to 5°, in the concealed gun scenario uncertainty on the expected decrease of assaults ranged from 500 to 9,000. Participants then answered a question on what values within the stated ranges were likely; all values were equally likely, values in the middle were more likely than values at the ends, lower values more likely or higher values more likely. These responses correspond to a uniform, roughly normal, positively and negatively skewed distributions, respectively.

As expected, participants tended to choose a distribution consistent with their worldview. Thus, in the climate change forecast, participants with worldviews related to climate change acceptance were more prone to perceive a negatively skewed or a normal distribution as more likely than a uniform, or positively skewed distribution, whereas those with worldviews associated with less climate change acceptance tended to see a uniform, or positively skewed distribution as more likely than other distributions. In the concealed gun carry scenario, participants with a worldview related to more pro-gun beliefs were more prone to perceive a normal- or a negatively skewed distribution as more likely than a uniform, or negatively skewed distribution. Participants with less pro-gun attitudes, more often saw a positively skewed distributions as more likely. For the neutral scenario, there were no relations between participants' worldviews and distribution preferences. A second study, using only the gun carry scenario, included a graphics condition in which a visual aid indicating a normal distribution was added, clarifying that values in the middle of the range were more likely than values at the ends. With no visual aid, participants tended to choose a distribution consistent with their worldview and attitudes. This bias was eliminated in the graphics condition where both pro-gun and less pro-gun participants chose the alternative corresponding to the normal distribution. Thus, distribution

perceptions of numerical ranges were affected by the motivations and worldviews of the end users. However, they were not willing to ignore the correct interpretation when it was made salient.

Discussion

Summing up, this review shows that although motivated and biased reasoning often leads people to reject well-based knowledge that is inconsistent with their prior beliefs and attitudes, there are some strategies that can be used to counter such biased reasoning. More specifically, three of the strategies reviewed have shown convincing effects across several studies and should be possible to apply in practical communication contexts. Other techniques are plausible but require further development and exploration before conclusions can be drawn with regard to their effects.

To begin with the most promising strategies, it seems clear that to be effective, science communicators need to consider recipients' core values and worldviews. Five separate experiments manipulated the compatibility between climate change messages and participant's partisanship or worldviews (Campbell & Kay, 2014; Feinberg & Willer, 2011; Kahan et al., 2015). All studies showed that information inconsistent with people's deeply held beliefs is likely to be met with skepticism, no matter how solid the evidence behind it may be. Interestingly, these motivated biases seem to occur for people holding conservative or liberal ideologies alike, depending on how the specific frame threatens or supports their respective ideologies. Importantly, the studies also consistently suggest that people can be open to facts if messages consider and are acceptable from the individual's viewpoint. To effectively communicate a scientific finding that points to a problem, a solution to the problem consistent with the individual's worldview should thus be provided to reduce the risk that the science itself is resisted. Hornsey and Fielding (2017) have labelled this approach *jiu jitsu persuasion*. As the martial art technique which teaches to use the opponent's force against them rather than trying to defeat them head on, jiu jitsu persuasion identifies the motivation underlying a specific attitude, and then frame the message so that it aligns with that motivation. As shown by Bayes et al. (2020), the persuasiveness of a message may be highest when its content also matches the individual's specific motivations in a given situation.

Having said that, communication often reaches out broadly to groups that differ in their worldviews, which may limit the possibility to tailor messages to fit recipients' worldviews. Nevertheless, as Campbell and Kay (2014) show, messages can be framed in ways that make the information acceptable across groups that diverge substantially in their worldviews. Hence, communicators should attempt to identify what broadly acceptable frames could be used for a target information.

A further notion that can be derived from this review is that wrapping scientific information on risks in negative terms, such as highlighting the undesirable impacts that could be expected from climate change, is likely to backfire.

The reviewed studies that compared people's reactions to messages using such negative, or *loss* frame, compared to a more optimistic, *gain* frame (Morton et al., 2011; Spence & Pidgeon, 2010), consistently showed that efficient promotion of climate change mitigation should focus on what can be gained by preventing efforts rather than on the negative impacts of not taking action. These findings fit well with theory and research showing that people are more risk-averse when a decision is framed in terms of gains, but more risk-seeking when considering choices that lead to losses (e.g. Tversky & Kahneman, 1981). For both types of framing discussed in this review (worldview, gain/loss), it would be valuable to test the generalizability to other contexts than climate change communication.

An interesting takeaway from the studies by Johnson (Johnson, 2017a, 2017b) is that even highly climate change skeptical individuals can be receptive to counter attitudinal evidence if it is presented in a logical and mechanistic way. In particular, when prompted to focus on an argument's explanatory power, people seem to be open to strong arguments, and become more aware of the weakness of circular reasoning. Drawing attention to the explanatory power of a message could thus be an important tool to decrease the rejection of facts that are in opposition with an individual's motivations. The limitation of this technique is that it probably depends on having an attentive and motivated audience. However, given such contexts, using explanations with high explanatory power, and drawing the audience's attention to this, seems a viable method for making communication of facts more effective.

Beyond the strategies discussed above, there are others that need to be further explored. For example, communicating in a clear and unambiguous way seems intuitively to be a straightforward way to reduce risks of biased interpretations. It is hence somewhat surprising that only one study in this review focused on reducing motivated bias that may result from information ambiguity. In Dieckmann et al.'s (2017) study, people's interpretation of the relative likelihood of different values in a given range was found to be biased to fit with their attitude on the target topic. However, adding a graphic showing a normal distribution on the uncertainty range attenuated this bias. Hence, by reducing ambiguity with respect to interpretation in a given communication context, people may be "nudged" away from biased processing. The finding is compelling, and further research studying how attempts to clarify complex information may affect motivated reasoning is clearly warranted.

Related to the benefits of using unambiguous information in communication contexts are the results of Baesler and Burgoon (1994), showing that the persuasiveness of statistical facts can be enhanced by reinforcing it with imaginative and concrete language. It seems reasonable that these aspects may also reduce potential ambiguity in the statistics, hence further demonstrating the benefits of information clarification.

As suggested by Chen and Unsworth (2019), it could also be important to also consider how the complexity of the communicated information may interact with the cognitive characteristics of the message recipients. Specifically,

it seems that people varying in cognitive complexity may react differently to complex vs. more simple messages. The challenge with using this approach in the applied context is to determine a priori who are likely to be high vs. low in cognitive complexity. Without such knowledge, this approach seems difficult to apply.

A different approach to refute knowledge resistance is to try to directly correct people's misconceptions. In the short term, corrections seem to make people revise their beliefs, conditioned on the corrections including strong or elaborate explanations that make the information believable (Rich et al., 2017). A potential limitation of corrections, however, is that their effects on belief change seem fairly short-lived or contingent on repetitions to attain longer-lasting impacts (Carnahan et al., 2020). Also, none of the studies reviewed here investigated the effects of corrections to misconceptions that are tied to people's core values. Future research should thus explore corrections of such motivated beliefs and try to better understand how effects of corrections could become more stable.

Three of the reviewed studies used self-affirmation, making people feel good about themselves, before trying to make them accept potentially threatening information. Two of these suggest that self-affirmed participants are less biased in their evaluation of counter-attitudinal information, or showed more acceptance of threatening health information (Cohen et al., 2000; Sherman et al., 2000). However, a rather alarming drawback with this technique is that it seems to make people more accepting of any type of information, which would be highly problematic in cases where the target information is erroneous (Munro & Stansbury, 2009). Hence, self-affirmation seems to reduce skeptical defensiveness toward information with undesirable implications for the self, but it does not appear to produce higher quality thinking in situations where a skeptical stance toward the information is advantageous.

The finding that exposure to opposing beliefs in a communication network can reduce partisan bias in interpretations of global warming (Guilbeault et al., 2018) attests to the power of social learning even for the most polarized topics. However, the improvement was contingent on the partisanship of the peers in the network being hidden. Even minimal cues to peer's partisanship eliminated social learning. The challenge then is to find ways to minimize the salience of partisan- or other group identities in information diffusion networks, given that such networks often are highly politically homogeneous.

Conclusions

Altogether, this review suggests a number of strategies for mitigating resistance toward facts that run counter to people's prior beliefs and attitudes, some of which seem possible to implement in an applied communication context. Hence, even if it will be impossible to eliminate all instances of motivated information processing, our conclusion is that most people have the capacity to put their

motivations aside and more rationally evaluate information, given the right conditions. It should however be noted that we only found 27 studies in 17 reports that experimentally manipulated knowledge resistance. This points to the need for an increased attention to this topic in experimental research. It should also be noted that the findings were almost exclusively positive, that is, the authors managed to demonstrate a hypothesized effect. This might suggest a selection bias where failed attempts to demonstrate an effect have been put in the file drawer (Ingre & Nilsson, 2018; Open Science Collaboration, 2015). Thus, ideally, the findings reviewed here should be further explored and replicated before being recommended as reliable communication strategies.

Note

- 1 Children or clinical groups = 5, direct experiences = 3, misinformation = 8, no evidence = 4, groups exposed to different evidence = 12, belief was not the outcome = 21, not experimental = 8, not a general fact = 20, other = 27.

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