Beyond persuasion: Improving conversational quality around high-stakes interpersonal disagreements

Julia A. Minson[1], David Hagmann[2], & Kara Luo[3]

[1] Harvard University

[2] The Hong Kong University of Science and Technology

[3] Stanford University

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Correspondence concerning this article should be addressed to Julia A. Minson, 124 Mt. Auburn St., Rm. 2324, Cambridge, MA 02138, USA. E-mail: julia_minson@hks.harvard.edu

Abstract

Heated exchanges over controversial topics can harm relationships while failing to change minds. Across five pre-registered experiments (N = 3,963), we tested a brief intervention to mitigate the interpersonal costs of disagreement and increase the likelihood of future conversations around vaccine hesitancy. Vaccine-supportive participants randomly assigned to training in conversational receptiveness were seen as more reasonable and more trustworthy than those writing in their natural tone, and evaluated their (untrained) counterpart more favorably. They were as persuasive as those who were incentivized to be persuasive only, and their counterparts were more interested in learning their views on other topics. Finally, receiving training in conversational receptiveness and learning that one's counterpart was similarly trained increased participants' willingness to discuss vaccines by 50%. We discuss the implications of these findings in the context of the many goals individuals pursue in contentious conversations and the outcomes conflict scholars should consider in future research.

Public Significance Statement: Conversational receptiveness improves contentious conversations, even on personal and controversial topics such as vaccine hesitancy. When we trained one conversation partner, they and their counterpart viewed each other more positively and were more willing to talk in the future, opening the door to more productive discussion of difficult topics. Focusing on outcomes beyond persuasion allows parties in conflict as well as researchers to consider new ways of improving contentious discourse.

Keywords: conflict, vaccine hesitancy, political polarization, conversational receptiveness

Word count: 10,118

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Introduction

Disagreement is a constant in human interactions, occurring over issues as minor as which TV show to stream or as consequential as child-rearing, corporate governance, and the functioning of democracies. Frequently, disagreement can strain or even break relationships, leading to diminished respect for the intelligence and personhood of those who maintain opposing views despite what appears to be overwhelming evidence to the contrary (Minson, Chen, & Tinsley, 2020; Ross & Ward, 1995; Schroeder, Kardas, & Epley, 2017). This breakdown in mutual regard has become acutely divisive in U.S. politics, where increasing geographical segregation among Democrats and Republicans reflects and exacerbates mutual animosity and prejudice (Brown & Enos, 2021; Finkel et al., 2020; Iyengar & Westwood, 2015).

In discussing topics of disagreement, especially those with important societal implications, people often seem narrowly focused on changing the minds of their opponents. Indeed, enhancing our ability to persuade has been a focus of communication experts from ancient Greek philosophers to modern pop-psychologists. In recent decades, the scholarly literature across the social science disciplines – including psychology, political science, management, and sociology – has contributed theoretically grounded and empirically supported insights to help people persuade the misinformed, the obstinate, and the irrational (Cialdini et al., 2021; Flores, 2017; Nyhan, Reifler, Richey, & Freed, 2014; Santos, Voelkel, Willer, & Zaki, 2022; Voelkel, Malik, Redekopp, & Willer, 2022). Some scholars have even gone as far as to argue that our capacity to reason has evolved specifically for the purpose of persuading others (Mercier & Sperber, 2011). But when the issue is personally relevant, highly consequential, and has divided entire populations into warring factions, is persuasion a realistic or even desirable goal?

Importantly, even when persuasion is unlikely, conversations may still function to advance multiple additional objectives (Yeomans, Schweitzer, & Brooks, 2022). People talk to exchange information, pass the time, express and receive social support, impress each other with their wit, deceive, blame, and praise. Beyond seeking to persuade, parties in disagreement might wish to learn about and understand each other's perspectives and intentions, restore trust, improve their relationship, or simply share their experiences. Perhaps most importantly, especially in cases of ongoing interdependence, the primary goal of any conversation might be to preserve enough goodwill to speak again. Yet, with few exceptions, the scholarly literature primarily centers on persuasion as the key outcome parties should focus on.

In the present work, we seek to go beyond the focus on persuasion and empirically test the effect of conversational receptiveness—the use of language to communicate one's engagement with opposing views (Yeomans, Minson, Collins, Chen, & Gino, 2020)—on a wider variety of conversational outcomes. We specifically focus on the effects of conversational receptiveness on disagreements about the COVID-19 vaccines – a highly politicized, consequential topic, that touches both personal choices and deeply held values. Although interventions that effectively change vaccine attitudes have been elusive (Milkman et al., 2022; Reddinger, Levine, & Charness, 2022), the topic has become difficult to avoid as people navigate social and workplace interactions. Across five studies, we examine the effects of conversational receptiveness on vaccine conversation outcomes, including interpersonal evaluations, desire for future contact, and of course, persuasion. Our goal is to rigorously test the effectiveness of this newly identified communication style in the context of extremely divisive disagreements and bring greater research attention to the many conversational objectives that parties in conflict may pursue.

Prior Research on Conversational Receptiveness

A growing literature has demonstrated the psychological and relational benefits of making disagreeing counterparts believe that you are thoughtfully engaged with their perspective, i.e. are "receptive" to their point of view. Individuals who are believed to be more receptive are seen as more desirable teammates, as having better judgment, and are more likely to receive help from opposing partisans (Chen, Minson, & Tormala, 2010; Heltzel & Laurin, 2021; Minson et al., 2020; Reschke, Minson, Bowles, De Vaan, & Srivastava, 2020; Yeomans et al., 2020). Yet, how does one convey their openness to considering their counterparts opposing views?

Recent research has addressed this challenge by leveraging natural language processing to analyze conversational transcripts and identify specific words and phrases that predict parties' perceptions that their counterpart is being receptive (Minson, Yeomans, Collins, & Dorison, 2023; Yeomans et al., 2020). The use of such words and phrases has been termed "conversational receptiveness." Subsequent experimental and field evidence found that the use of conversational receptiveness enhances counterpart evaluations of each other and prevents conflict escalation, even on highly divisive topics. For example, in Yeomans et al. participants discussing police brutality, marijuana legalization, or the death penalty using high levels of conversational receptiveness were evaluated more positively by their disagreeing counterparts at the end of the discussion.

Measurement of conversational receptiveness in written or spoken text relies on a natural language processing algorithm (Yeomans, Kantor, & Tingley, 2019), which allows large amounts of text to be analyzed quickly and reliably. At a high level, the algorithm tallies the words and phrases that are correlated with perceptions of greater receptiveness (i.e. "positive features"), as well as those that are correlated with perceptions of lesser receptiveness ("negative features") and weights them to produce an overall receptiveness score for a piece of text. An example of a positive feature is "Acknowledgement," expressed

with phrases such as “I understand that. . . ” or “You are saying. . . ”. A negative feature is “Negation” which is expressed with words like “can’t,” “won’t,” “no,” etc. Table 1 lists the primary features of conversational receptiveness along with phrase examples (Yeomans et al., 2020). Importantly, prior research has also made both conceptual and empirical distinctions between conversational receptiveness and related constructs such as politeness, or positive sentiment (Yeomans et al., 2020), showing that conversational receptiveness uniquely predicts outcomes in conflict.

Because conversational receptiveness is defined by a specific set of words and phrases, it can be taught to experimental participants with relative ease. This, in turn, enables researchers to examine the causal effects of a receptive communication style for a variety of conversational outcomes, including interpersonal evaluations, willingness to have future interaction, and attitude change. In the present research, we leverage the ability to randomly assign individuals to different levels of conversational receptiveness to test the potential benefits of a brief training in receptive communication.

Features of Conversational Receptiveness	**Example Words/Phrases**
Acknowledgment	"I understand," "I get"
Agreement	"I agree," "We both"
Hedges	"Sometimes," "Maybe"
Subjectivity	"I think,", "In my opinion"
Positive Emotion	"I love," "Great," "Not bad"
Negative Emotion	"Not good," "Terrible"
Disagreement	"I don’t agree"
Adverb Limiters	"Just," "Only," "Simply"
Negations	"Did not," "Would not," "Never"

Table 1
Features that increase (purple) or decrease (tan) conversational receptiveness.

Receptiveness and its Benefits

Although academic interest in receptiveness to opposing views has been quickly growing, few studies have randomly assigned parties actively engaged in disagreement to

act with greater or lesser receptiveness and then measured the resultant interpersonal outcomes. One notable exception is Study 4 of Yeomans et al. (2020). In this study, participants were randomly assigned to craft a message on a contentious policy topic and received instructions to either do so using their natural conversational style or after brief training in conversational receptiveness. The messages were then read and evaluated by a second group of participants who disagreed with the writers. Writers who were trained in conversational receptiveness were seen as more desirable team-mates, as having better professional judgment, and as more attractive organizational representatives by their disagreeing counterparts.

In addition to garnering interpersonal benefits, prior research suggests that receptiveness may also enhance persuasiveness. For example, Yeomans et al. (2020) also asked participants whether their view had changed in the direction advocated by their counterpart or in the opposite direction. Participants trained in conversational receptiveness were found to be slightly more persuasive than their untrained counterparts. Relatedly, Hussein and Tormala (2021) reviewed the persuasion literature to examine how other behaviors conceptually associated with receptiveness impacted persuasion. They concluded that behaviors including conveying uncertainty, acknowledging mistakes, highlighting drawbacks, and asking questions (which they termed "signals of receptiveness") enhanced persuasion across a variety of contexts.

Although these findings appear promising, the types of disagreements examined may not be reflective of the conversations that deeply divide people. Most prior work in this area has examined topics in which participants hold low personal stakes. For example, many studies examine preferences for particular consumer products or experiences including restaurant reviews, song preferences, coffee and shoe brands, etc. (Bohner, Einwiller, Erb, & Siebler, 2003; Karmarkar & Tormala, 2010; Reich & Maglio, 2020). Indeed, many feature fictional products, such that participants did not have a prior opinion on the issue at all. And although several studies did examine topics of greater import (e.g.,

changes to university policies, Blankenship & Craig, 2007; Petty & Cacioppo, 1979), it is clear that even these weightier topics are categorically distinct from those that tear apart relationships and nations: abortion, guns, immigration, climate change, etc.

Importantly, some recent work has attempted to use behaviors related to receptiveness to shift attitudes even within highly controversial domains. For example, Broockman and Kalla (2016) found that a non-judgmental exchange of personal narratives affected voters' attitudes regarding LGBTQ legislation. And the Yeomans et al. studies cited above engaged participants in discussions regarding police misconduct.

However, even among these "hot-button" topics, the issue of COVID vaccines represents a unique category of disagreements. At the hight of the pandemic, one's own decision to get vaccinated or not as well as the decisions of family members, co-workers, and classmates materially affected the decisions and outcomes of those they came in contact with. And whereas a similar argument can, in theory, be made for disagreements about abortion rights, guns, or immigration, in reality, these issues tend not to have personal relevance for most typical study participants. However, as uniquely difficult as the topic of vaccines is, it is but one example of the sort of personal decision that people make and disagree about regularly. The choice to smoke tobacco, use pesticides on one's lawn, or own a firearm, all fall into the category of decisions about which individuals might hold deep convictions and which can readily impact the health and well-being of those around them. To the extent that people wish to engage in discussions on these topics, providing them with the tools to do so productively may improve a range of important outcomes.

Disagreement about Personal Choices

Extensive research has sought to identify an intervention that would effectively persuade the vaccine hesitant to get vaccinated, with little success (Milkman et al., 2022; Reddinger et al., 2022). Recently, convincing vaccine-hesitant people to receive the

COVID-19 vaccine has even backfired by coming to be seen as coercive and ultimately increasing belief in misinformation (Helfers & Ebersbach, 2023).

Such resistance to persuasion in this domain is unsurprising, since deep-seated beliefs, especially those governing high-stakes personal choices, are difficult to modify (Abelson, 1988). Individuals experience psychological reactance when others seek to change their behavior (Reynolds-Tylus, 2019). Classic theories propose that reactance arises from the belief that others are trying to limit one's freedom (Brehm, 1966)—a theme that often emerges in healthcare discussions (Sprengholz, Felgendreff, Böhm, & Betsch, 2022). Reactance is exacerbated when the persuasive effort is arising from outgroup members (Graupmann, Jonas, Meier, Hawelka, & Aichhorn, 2012; Silvia, 2005) and in contexts related to morality (Pavey, 2022). Thus, conversations around topics which feature not only deep-seated beliefs (e.g. the morality of the death penalty) but also important personal choices (e.g. vaccination or gun ownership), may require participants to consider outcomes beyond persuasion to make progress.

Based on these considerations, we argue that research on navigating contentious topics featuring ideology and personal decisions should seek to advance other goals besides immediate attitude change. In contexts where persuasion is extremely unlikely and overt attempts at such might be badly received, interlocutors and scholars should broadly consider how to improve parties' outcomes over the status quo of mutual avoidance and derogation. For example, might the conversation be considered a success if the disagreeing counterparts come to see each other as more trustworthy or more resonable? If they are willing to engage with each other in the future? Or even if they simply find the conversation to be less aversive than they anticipated it to be? In other words, when persuasion seems extremely unlikely, might parties simply seek to approach conversations in a manner that enhances trust, preserves relationships, and ultimately leads to continued dialogue?

Developing new approaches for discussing divisive topics, especially in the public health domain, is necessary because currently available tools have limited empirical support. For example, many healthcare organizations train employees in motivational interviewing (MI), a technique originally created to support behavioral change for people struggling with addiction (Miller & Rollnick, 2002). Rather than directing a patient to change, MI seeks to motivate the patient to wish to change. MI follows four principles: 1) expressing empathy; 2) developing the discrepancy between actual and desired behaviors; 3) "rolling with it" when encountering resistance; and 4) supporting the target's self-efficacy (Miller & Rollnick, 2002). As may be apparent from the description, MI requires considerable training, making implementation difficult. As a result, researchers have tested simplified versions of MI—"augmented motivational interviewing" (AMI). Most evaluations of AMI, however, suffer from ambiguity about what defines the intervention, how providers were trained, and how the intervention was implemented. Thus, while reviews conclude that MI and AMI trainings likely have modest benefits, the mechanisms, moderators, and robustness of these benefits remain unknown (Broomfield et al., 2011; Burke, Arkowitz, & Menchola, 2003). Furthermore, these techniques have not been tested in the context of actual disagreement between parties, where one individual (a gun rights advocate or someone resistant to the idea of vaccines) has no interest at all in changing their behavior.

Recent public health crises have spurred the development of extensive support materials for difficult conversations. Unlike conversational receptiveness, however, which is made up of concrete words and phrases, most of these tools offer parties broad suggestions (e.g., "start from a place of empathy and understanding" or "be prepared to answer questions," CDC COVID-19 Response Vaccine Task Force, 2021) that individuals must interpret on their own in order to implement effectively. Furthermore, while such recommendations are generally face-valid, they have not been experimentally tested. Do people have thoughtful discussions or does a typical conversation devolve into conflict? Does persuasion ever occur? Do parties wish to speak again? In the meantime, the need to

improve convesations quality across hot-button issues concerning personal behavior is urgent. In the present research, we seek to address this need by testing a theoretically rigorous and validated approach in the context of vaccine disagreement. In testing the effects of conversational receptiveness in this highly contentious and deeply personal domain we offer evidence of its effectiveness in other similar contexts as well as highlight the need to focus on the multiplicity of outcomes that parties in conflictual dialogue may wish to pursue.

Research Overview

We report the results of five pre-registered experiments examining effects of conversational receptiveness training on disagreement around the COVID-19 vaccines. In an initial pilot study, we recruit participants to evaluate two messages from a hypothetical doctor. The informational content of the messages is identical, but in one condition, the message is bracketed by additional text high in conversational receptiveness. We find that the receptive doctor is rated more favorably by participants. In Studies 1-3, we experimentally test the effect of short conversational receptiveness training on the quality of communication about COVID-19 vaccines between vaccine supportive and vaccine hesitant individuals. In Study 4, we examined individuals' intentions to engage with disagreeing others with or without conversational receptiveness training. In all studies, we focus on participants' evaluations of each other, seeking to test conversational receptiveness as a tool for rebuilding trust, de-escalating conflict, and increasing willingness to engage in future dialogue.

Open Science Statement. We report all manipulations, measures, and data exclusion in our studies. We preregistered all studies on AsPredicted.org. The preregistration reports, screenshots of all experimental materials, and the analysis code to replicate all statistical analyses and figures are available on the Open Science Framework (https://osf.io/jycrf/?view_only=4a8b331c44a04d35895366874296f64c).

Pilot Study: Evaluating Hypothetical Messages

In our initial examination of the effects of conversational receptiveness on vaccine conversations, we presented participants with a hypothetical message from a doctor who is responding to a vaccine hesitant resident at a town hall meeting. The scripted scenario allows us maximum control over both the content and the communication style of the messages. Our control message argues that the COVID-19 vaccine is safe and effective. The receptive message contains the identical text but brackets the message with additional language containing features of conversational receptiveness. We predicted that participants would evaluate the receptive doctor more positively. Based on prior research, we also predicted that the receptive message would be more persuasive.

Method

We recruited participants through Amazon Mechanical Turk for a screener survey asking about upcoming activities participants may engage in. One of the questions asked about their plans to receive a COVID-19 vaccine as soon as one became available. We conducted the survey in February of 2021, as the campaign to vaccinate the general public in the United States was beginning. Participants who answered that they were "Extremely unlikely," "Very Unlikely," or "Somewhat unlikely" to get the COVID vaccine as soon as it became available were invited to continue to the main experiment. Our preregistered sample size was 400 participants completing the main experiment, with participants added in increments of 25 until we reached this target. We ended up with a total sample of 424 participants.

Vaccine-hesitant participants first reported their level of worry about the safety and effectiveness of the COVID-19 vaccines using 5-point Likert scales, ranging from "not at all worried" to "extremely worried." They then read a scenario about a town-hall meeting during which a local doctor responded to a vaccine hesitant resident. We randomly

assigned participants to one of two conditions which differed in the statement made by the doctor. Both messages made identical strong arguments for the safety and efficacy of the vaccines as well as the importance of getting vaccinated. However one of the messages also included receptive language at the beginning and end of the arguments.

After reading the message, the participants evaluated the intelligence, reasonableness, expertise, and trustworthiness of the doctor using 5-point Likert scales, ranging from "not at all" to "extremely." The participants then again expressed their views about the safety and effectiveness of the vaccine.

Results

Participants who read the message including conversational receptiveness viewed the doctor as significantly more reasonable (3.54 vs. 3.25, $\Delta M = 0.29$, 95% CI $[0.08, 0.49]$, $t(416.21) = 2.74$, $p = .006$) and marginally more trustworthy (3.13 vs. 2.92, $\Delta M = 0.20$, 95% CI $[-0.02, 0.42]$, $t(418.56) = 1.81$, $p = .071$) than participants who read the control message. We found no difference between the perceived intelligence (3.65 vs. 3.50, ($\Delta M = 0.15$, 95% CI $[-0.03, 0.33]$, $t(421.54) = 1.64$, $p = .101$) and expertise (3.53 vs. 3.49, $\Delta M = 0.04$, 95% CI $[-0.16, 0.24]$, $t(419.94) = 0.42$, $p = .674$) of the doctor across conditions.

Participants in both conditions reported slightly lower levels of concern with the safety and efficacy of the vaccines, although there were no statistically significant differences between the two experimental conditions (a decrease of 0.23 and 0.14, $\Delta M = -0.08$, 95% CI $[-0.21, 0.04]$, $t(419.26) = -1.34$, $p = .183$ and 0.20 and 0.17, $\Delta M = -0.04$, 95% CI $[-0.17, 0.09]$, $t(418.26) = -0.56$, $p = .574$).

Control Message
The vaccine is very safe. Millions of people all around the country have already been vaccinated and there have been very few reactions. Plus, the clinical trials started months ago, so we now have a lot of data on the people who were the first to get the vaccine, and it is all very reassuring. The pharmaceutical companies that are producing these medicines have produced medications that billions of people in the world have relied on for decades. They are being very closely regulated and monitored by American regulators and regulators in Europe and worldwide. People who get vaccinated have had minimal side-effects and a 95% lesser chance of getting COVID. Without vaccines, 400,000 Americans have died from this illness. Many of them were strong and healthy, some were kids. Just having a healthy immune system doesn't guarantee anything. If you don't take the vaccine, you are risking not only your health, but that of others you come in contact with. Our hospitals are so full of COVID patients, we are running out of beds for people with pneumonia, or heart attacks, or accidental injuries. If you have the chance to take the vaccine, but forego it, you could be one of those people taking up one of those beds.
Receptive Message
Thank you for sharing that point of view, sir. I understand that you are concerned about the safety profile of this very new medication. I also agree with you that we have to be very cautious in these unprecedented circumstances. I think it's wonderful that you are raising these issues because I think they are important to discuss. The vaccine is very safe. Millions of people all around the country have already been vaccinated and there have been very few reactions. Plus, the clinical trials started months ago, so we now have a lot of data on the people who were the first to get the vaccine, and it is all very reassuring. The pharmaceutical companies that are producing these medicines have produced medications that billions of people in the world have relied on for decades. They are being very closely regulated and monitored by American regulators and regulators in Europe and worldwide. People who get vaccinated have had minimal side-effects and a 95% lesser chance of getting COVID. Without vaccines, 400,000 Americans have died from this illness. Many of them were strong and healthy, some were kids. Just having a healthy immune system doesn't guarantee anything. If you don't take the vaccine, you are risking not only your health, but that of others you come in contact with. Our hospitals are so full of COVID patients, we are running out of beds for people with pneumonia, or heart attacks, or accidental injuries. If you have the chance to take the vaccine, but forego it, you could be one of those people taking up one of those beds. I really understand what you are saying though. A lot of people might be feeling a little uncomfortable because the vaccines are so new. I also recognize that people don't want to be told what to do. I think we all agree though that we want what is best for our city and to get back to normal as quickly as possible. I am really excited about the idea of getting our schools and businesses opened up again, and I think the vaccine is the best way to get there. I am really happy that you came out tonight to discuss these issues.

Table 2

Pilot Study Messages. The receptive message contained identical arguments to the control message, but bracketed it with additional text containing features of conversational receptiveness.

Discussion

When presented with information from an expert that contradicted their own beliefs, participants evaluated the expert as more reasonable and marginally more trustworthy when they signaled receptiveness. Notably, the body of the message was forceful and unchanged across conditions. However, the receptive message began and ended with a simple acknowledgment of why someone may hold a different position. Importantly, this work is in line with previous findings regarding the benefits of receptiveness, especially when expressed by high status communicators (Hussein & Tormala, 2021). However, participant attitudes toward the vaccine did not change significantly in either treatment.

The hypothetical nature of the message allowed us to closely control the content. In future studies, we rely on messages written by real participants that capture the effect of training them to communicate receptively and accounting for the challenge that they may not do so perfectly. We also measure interpersonal evaluations, future intentions and persuasion in a variety of ways to again try to capture any potential downstream effects of our intervention.

Study 1: Evaluating Authors of Counter-Attitudinal Messages

In Study 1, we recruited vaccine-supportive participants to write an argument for why the vaccines are safe and effective, in response to a prompt expressing hesitancy. We randomly assigned these writers to instructions to be as persuasive as possible or instructions in conversational receptiveness. We then recruited vaccine-hesitant participants and asked them to evaluate the messages and the vaccine-supportive authors.

Method

In February of 2021, shortly after vaccines were made available to the public in the United States, participants on Prolific Academic responded to a set of questions about

upcoming activities they may engage in. One of the questions concerned their willingness to receive a COVID-19 vaccine as soon as one became available (the rest were decoy options to mask the purpose of the screening survey). We recruited 423 participants who reported that they are "Somewhat likely," "Very likely" or "Extremely likely" to get the COVID vaccine. We then asked them to write a response to a message written by a fictitious vaccine-hesitant individual (see Supplemental Information for all experimental materials). This message was identical for all participants and expressed concerns about the speed at which the vaccines were developed, as well as the profit motives of the pharmaceutical companies. We wrote the message to capture plausible and broadly voiced concerns around the vaccine without including any misinformation.

We randomly assigned participants to one of two conditions. In the Receptive condition participants received instructions about the features of conversational receptiveness and took a short comprehension quiz. The instructions provided them with the linguistic cues that prior research has identified as signaling receptiveness to opposing views. We asked participants to respond to the vaccine-hesitant message and "to signal receptiveness as best you can, using the strategies you learned about." They were also reminded of the four strategies: "Use positive affirming statements, not contradicting statements," "Acknowledge the other person's views," "Use hedges to soften your claim," and "Try to find points of agreement" (see the screenshots of the experimental materials in the Supplemental Information for more details). In the Persuasive condition, in order to equalize effort, participants read an unrelated scientific article about the discovery of a new species of fish and also took a comprehension quiz on the content. We asked these participants to respond to the vaccine-hesitant message and "to be as persuasive as you can, using the best arguments and reasoning you can think of." Per our pre-registered exclusion criteria, we removed responses that consisted of fewer than 50 words, retaining a sample of 382 participants (55.61% Female, $M_{age} = 32.60$).

After completing the writing task, we asked participants to report their own vaccine

attitudes to ensure that being receptive to a vaccine-hesitant counterpart did not erode their support for the vaccine. Specifically, they reported the extent to which they agree with the statement "When a COVID-19 vaccine is available to someone, they should get it as soon as they can to protect themselves and others" on a 7-point Likert scale from "Strongly disagree" to "Strongly agree" and how important this issue is to them on a 5-point Likert scale from "Not at all" to "Extremely important." To assess whether the conversational receptiveness training impacted the participant's perception of the vaccine-hesitant target, we also asked them to evaluate how intelligent, knowledgeable, reasonable, and trustworthy they thought the vaccine-hesitant target was, using 5-point Likert scales from "Not at all" to "Extremely."

We then recruited 600 new participants to evaluate the authors of the messages. We selected participants from our screener survey who stated that they were "Somewhat unlikely," "Very unlikely," "Extremely unlikely," "Neither likely nor unlikely," or "Somewhat likely" to get the COVID vaccine as soon as it became available to them. Each participant viewed one of a subset of the 45 most receptive messages, as rated by the receptiveness algorithm (Yeomans et al., 2020) in the Receptive condition, or one of a randomly selected subset of 45 messages from the Persuasive condition. They then evaluated the reasonableness and trustworthiness of the message author using 5-point Likert scales from "Not at all" to "Extremely."

Participants also reported the change in their attitudes toward the COVID-19 vaccines after they had read the message. Specifically, they reported change in their concerns regarding the safety and efficacy of the vaccine (using 7-point Likert scale from "Much less worried" to "Much more worried"), and their willingness to get vaccinated (on a 7-point Likert scale from "Much less willing" to "Much more willing"). This measure was modeled on the wording used in Study 4 of Yeomans et al. (2020). Two messages in the Persuasive condition failed to display in the survey due to their use of special characters, leaving us with a final sample size of 586 raters.

Results

We first used the conversational receptiveness algorithm (Yeomans et al., 2020) to test whether our manipulation induced writers in the Receptive condition to use significantly more receptive language. The algorithm assigns each message a value, with larger numbers denoting greater receptiveness. The range of scores across all our messages ranged from -1.37 to 1.29, and the average was significantly higher in the Receptive condition than in the Persuasive condition (0.24 vs. 0.28 -0.16, $\Delta M = 0.40$, 95% CI $[0.34, 0.46]$, $t(380) = 13.18$, $p < .001$). In other words, people readily incorporated conversational receptiveness into their writing.

Beyond simply using more receptive language, we found that the writers in the Receptive condition evaluated the vaccine-hesitant target as more intelligent (2.63 vs. 2.42, $\Delta M = 0.21$, 95% CI $[0.04, 0.38]$, $t(380) = 2.50$, $p = .013$), more reasonable (2.52 vs. 2.25, $\Delta M = 0.27$, 95% CI $[0.07, 0.46]$, $t(380) = 2.65$, $p = .008$), more knowledgeable (2.12 vs. 1.75, $\Delta M = 0.38$, 95% CI $[0.21, 0.54]$, $t(380) = 4.50$, $p < .001$), and more trustworthy (2.41 vs. 2.09, $\Delta M = 0.32$, 95% CI $[0.15, 0.50]$, $t(380) = 3.63$, $p < .001$) than did those in the Persuasive condition (see Figure 1). This result is particularly striking given that all writers responded to the same prompt. It appears that the mere use of conversational receptiveness also shifted writers' perceptions of their counterpart.

If this is the case, one might worry that the receptive message authors also may have become more vaccine hesitant. Importantly, however, we found no difference between authors of Receptive and Persuasive messages with regard to their own attitude toward vaccination (2.54 vs. 2.58, $\Delta M = 0.04$, 95% CI $[-0.10, 0.19]$, $t(380) = 0.57$, $p = .567$) or the importance they place on others getting vaccinated (4.37 vs. 4.43, $\Delta M = 0.06$, 95% CI $[-0.10, 0.21]$, $t(380) = 0.74$, $p = .457$), suggesting that the use of receptive language toward others did not change one's own attitudes.

Next, we turn our attention to the vaccine-hesitant participants who evaluated a

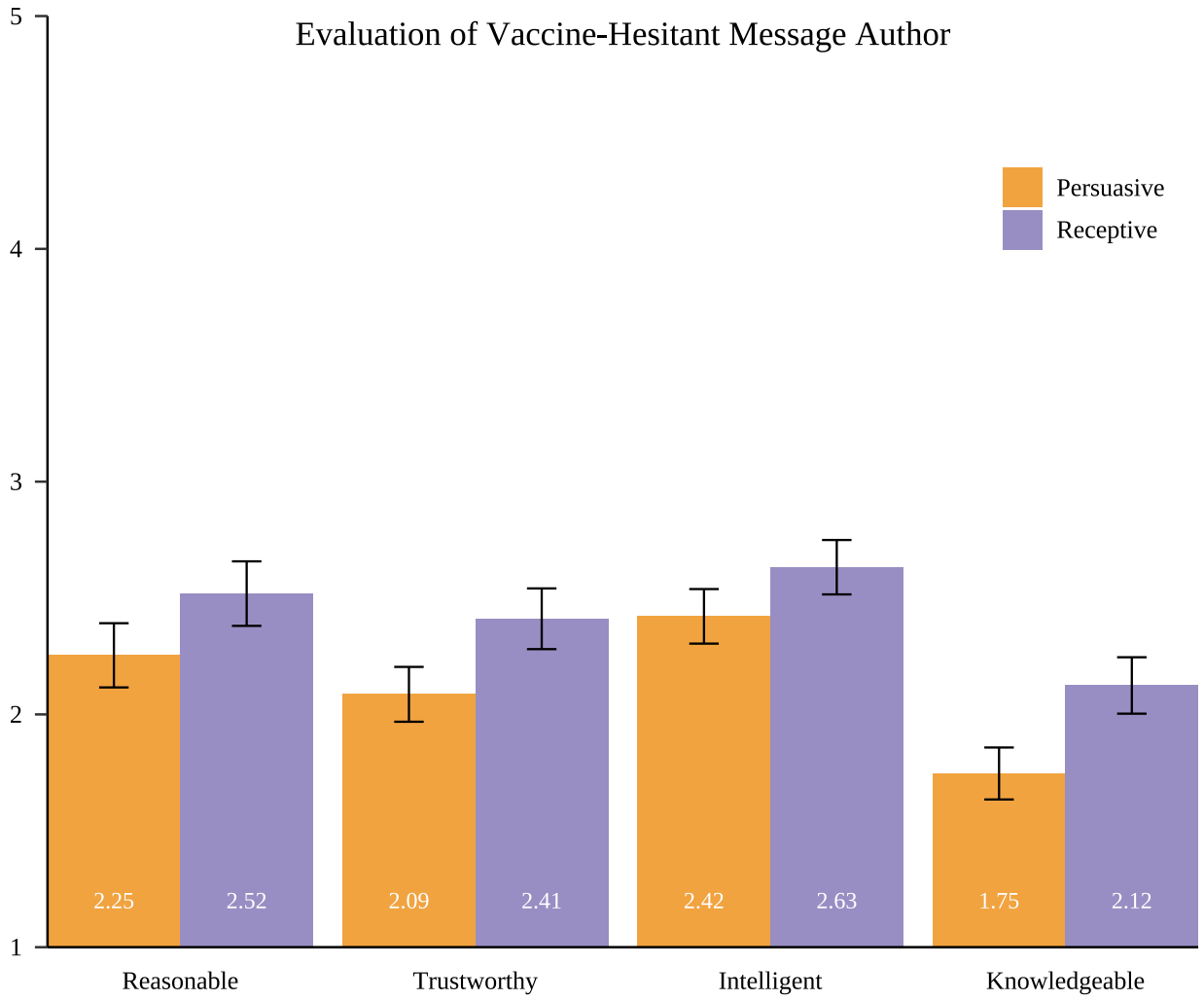

Figure 1. Study 1. Participants who wrote a response to a hypothetical vaccine-hesitant person formed more favorable impressions of their counterpart after writing a receptive message than a persuasive message. The message they responded to was identical across all participants and both experimental conditions. Error bars show 95% confidence intervals.

randomly selected message from a vaccine-supportive counterpart. In line with our predictions, we found that participants thought the authors of the Receptive messages were more reasonable than those in the Persuasive group (3.62 vs. 3.33, $\Delta M = 0.29$, 95% CI $[0.12, 0.45]$, $t(584) = 3.46$, $p < .001$), and evaluated them as more trustworthy (3.20 vs. 2.86, $\Delta M = 0.35$, 95% CI $[0.18, 0.51]$, $t(584) = 4.14$, $p < .001$, see Figure 2).

The changes in concern with safety and efficacy of the vaccine did not differ between conditions (0.21 vs. 0.25 for safety in the Receptive and Persuasive conditions, respectively, $\Delta M = 0.04$, 95% CI $[-0.16, 0.24]$, $t(584) = 0.38$, $p = .702$, and 0.10 vs. 0.00 for efficacy $\Delta M = 0.10$, 95% CI $[-0.10, 0.30]$, $t(584) = 0.99$, $p = .325$), nor did participants' willingness to get vaccinated (-0.03 vs. 0.03, $\Delta M = 0.05$, 95% CI $[-0.16, 0.27]$, $t(584) = 0.50$, $p = .619$). It is worth noting that, unlike prior research, the participants in our Persuasive condition were instructed to be as persuasive as possible, setting a higher bar for any persuasive effect of conversational receptiveness. The fact that this less confrontational style was no less persuasive is indeed quite notable in and of itself.

Although we did not preregister a mediation analysis, our data allow us to examine whether the language used in the vaccine-supportive messages statistically mediates the differences in writer evaluations observed between conditions. To conduct this analysis, we created an index of writer evaluations by averaging the ratings of writer reasonableness and trustworthiness ($\alpha_{\text{Index}} = 0.84$). When we regress this index on condition, we see a robust effect of condition assignment on writer evaluations ($b = 0.32$, 95% CI $[0.17, 0.47]$, $t(584) = 4.10$, $p < .001$). When we add the receptiveness of the message to the regression, we see that message receptiveness becomes a significant predictor of writer evaluations ($b = 0.28$, 95% CI $[0.01, 0.54]$, $t(583) = 2.08$, $p = .038$), and the effect of condition falls below the level of statistical significance ($b = 0.13$, 95% CI $[-0.11, 0.36]$, $t(583) = 1.05$, $p = .292$). Estimating the effect sizes in the mediation model reveals a direct effect of condition on writer evaluations of 0.13, and an indirect effect through message receptiveness of 0.09, suggesting that 41% of the total treatment effect on writer evaluations is mediated

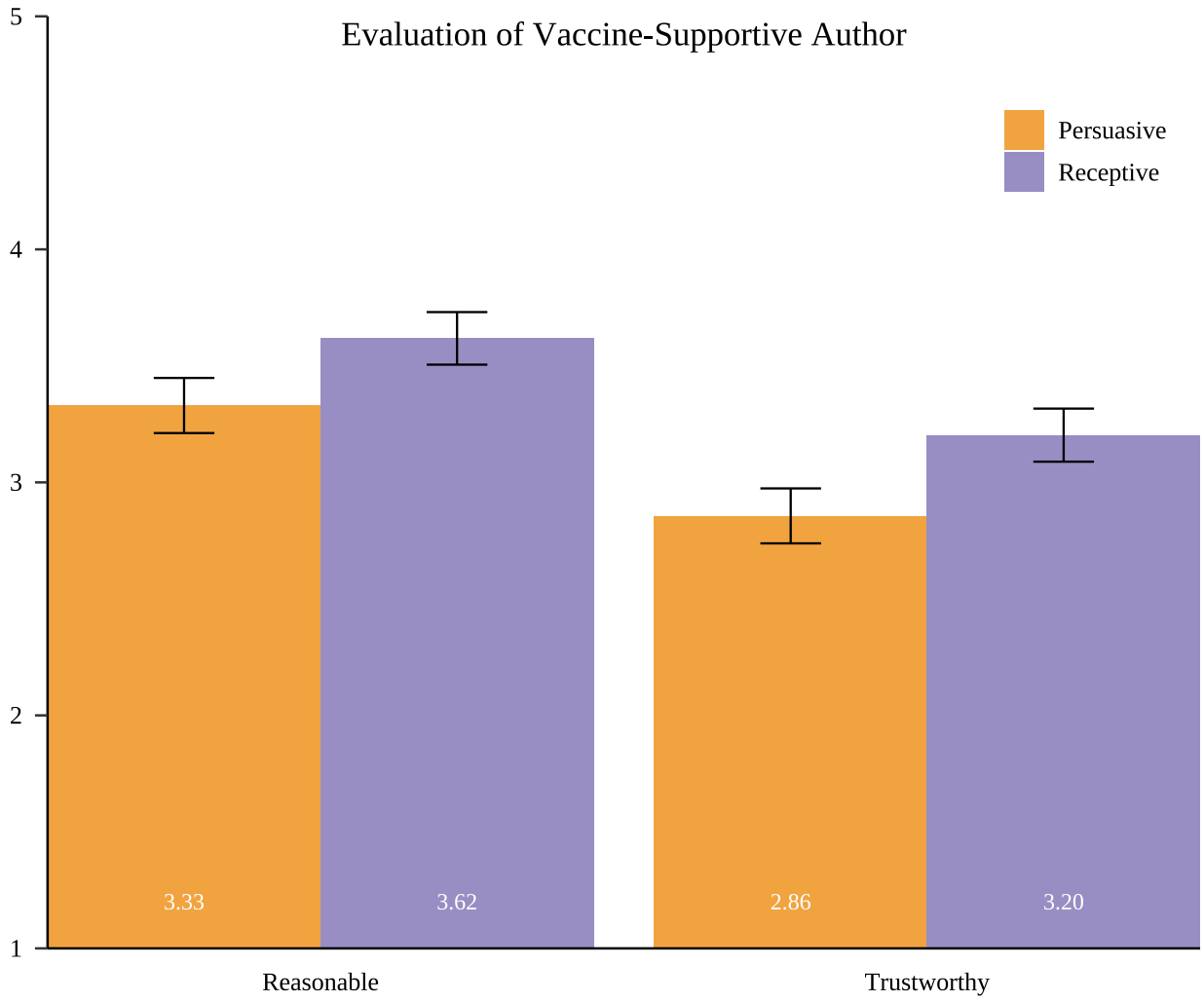

Figure 2. Study 1.Vaccine-hesitant participants evaluated authors of receptive messages more favorably than authors of persuasive messages who were not trained in conversational receptiveness. Error bars show 95% confidence intervals.

by the words and phrases that can be observed and measured in the messages.

Discussion

Study 1 provided additional evidence of the benefits of conversational receptiveness for vaccine conversations. Unlike our pilot study, where all vaccine-hesitant readers responded to messages written by us, in Study 1 the messages were written by real participants who received minimal training in conversational receptiveness. Importantly, both vaccine-hesitant and vaccine-supportive participants evaluated counterparts more positively, suggesting that conversational receptiveness can ease the interaction not only for the person who is on the receiving end of receptiveness, but also for the person who is implementing more receptive communication.

As in our pilot study, we did not see differences in evaluation of the vaccine itself as a result of our treatment. While this suggests that receptiveness does not enhance persuasiveness, it also implies that the interpersonal benefits do not come at the expense of persuasion. This latter finding is potentially consequential since the participants in our control condition were instructed to be as persuasive as possible.

Study 2: Asynchronous Conversation

In Study 2, we build on the prior designs by matching vaccine-hesitant and vaccine-supportive participants for an asynchronous exchange of messages. In Study 1, vaccine hesitant participants evaluated a message that was crafted in response to a generic message expressing common concerns around the COVID-19 vaccines. By contrast, in Study 2, vaccine hesitant participants wrote a message expressing their individual concerns and then received and evaluated a response from a vaccine-supportive individual who did or did not receive conversational receptiveness training.

Method

The study was conducted in April of 2021 when vaccines became more broadly available in the United States. We used a screener survey to categorize participants into a group of the vaccine-hesitant (those reporting being "Not at all willing" or "Slightly willing" to get the COVID vaccine as soon as it becomes available) and vaccine-supportive (reporting "Extremely willing" or "Very willing").

In the first stage, we asked 689 vaccine-hesitant participants via both Prolific and MTurk to write a message explaining their reasons for vaccine hesitancy. To ensure that participants offered clear explanations we asked them to write at least 50 words and dropped data from participants who wrote less. We also asked them how concerned they were about the safety and effectiveness of the vaccine using a 5-point Likert scale, ranging from "Not at All" to "Extremely."

Next, we randomly assigned the vaccine-supportive participants from our screener survey to learn about conversational receptiveness or the discovery of a new species of fish. To equalize effort, participants in both groups completed a comprehension check on the material. We then instructed participants to write a message in response to a vaccine-hesitant counterpart and offered financial incentives to ensure effort. In the Receptive condition, we truthfully told participants that their writing would be evaluated by an algorithm measuring the presence of conversational receptiveness and that we would randomly select one of the 20 most receptive messages and award the author a $50 bonus. In the Persuasive condition, participants could earn an equivalent bonus if they were among the 20 writers who most increased the recipient's self-reported willingness to get vaccinated. Participants who wrote fewer than 50 words were excluded from the study, and we invited new participants to write a response to the vaccine-hesitant author in their place. We thus ended up with responses to each of the original 656 vaccine-hesitant messages meeting the inclusion requirement.

As in the prior study, vaccine-supportive participants then rated how reasonable and trustworthy the vaccine-hesitant sender was. We also asked them whether they would want to learn that person's opinion on another topic, to test whether more positive attitudes in the context of vaccine disagreement would spill over into other domains. For example, a more congenial conversation about vaccines, even in the absence of persuasion, might allow two family members to be more willing to still discuss other topics such as holiday plans or financial decisions. Additionally, participants reported how difficult they found employing the conversation style in their message (Persuasive or Receptive) and how likely they were to use it in the future. Each of these ratings was made on 5-point Likert scales anchored at "Not at all" to "Extremely." Finally, participants reported how worried they were about the safety and efficacy of the vaccine on 5-point Likert scales from "Not at all worried" to "Extremely worried."

We then sent the messages to the original vaccine-hesitant participants, 487 of whom returned to complete the message evaluation task. After reading the response to their concerns, they evaluated the trustworthiness and reasonableness of the author. They also reported their willingness to get this person's opinion on another topic. Each of these ratings was reported on a 5-point Likert scale from "Not at all" to "Extremely." Finally, they reported the change in their attitude toward getting the vaccine on a 7-point Likert scale from "Much less willing" to "Much more willing."

Results

The algorithmic measure confirmed that the treatment again increased conversational receptiveness of the vaccine-supportive writers. The receptiveness algorithm gave scores ranging from -1.21 to 1.97, and messages in the Receptive condition scored significantly higher than the Persuasive condition (0.38 vs. -0.18, $\Delta M = 0.56$, 95% CI $[0.50, 0.61]$, $t(654) = 20.52$, $p < .001$).

Participants who wrote a receptive message again made more positive inferences about the vaccine-hesitant people they were responding to than the participants in the Persuasive condition (see Figure 3). Specifically, they evaluated them as more reasonable (2.65 vs. 2.41, $\Delta M = 0.24$, 95% CI $[0.06, 0.42]$, $t(654) = 2.59$, $p = .010$), and more trustworthy (2.69 vs. 2.40, $\Delta M = 0.29$, 95% CI $[0.12, 0.45]$, $t(654) = 3.45$, $p < .001$). They were also more willing to get their counterpart's advice on another topic (2.77 vs. 2.52, $\Delta M = 0.25$, 95% CI $[0.06, 0.43]$, $t(654) = 2.60$, $p = .010$).

In this study, we also saw a marginal difference in concern with safety (1.81 vs. 1.67 for writers in the Receptive and Persuasive conditions, respectively, $\Delta M = 0.14$, 95% CI $[0.00, 0.27]$, $t(654) = 1.94$, $p = .053$) as well as with efficacy (1.79 vs. 1.66, $\Delta M = 0.12$, 95% CI $[0.00, 0.25]$, $t(654) = 1.93$, $p = .054$). The emergence of this difference suggests that vaccine-supportive participants did take their counterparts' concerns seriously - expressing receptiveness might have made them actually consider the other perspective. However, given that concern in both conditions remained below a 2 on a 5-point scale, we would be extremely surprised if this change had any substantive effect on future vaccination behavior.

One concern with recommending conversational receptiveness as a widely used intervention is that it may be difficult to implement. To address this concern, we examined the participant experience with using this communication style. When we asked the vaccine-supportive participants in both conditions about how difficult they found their writing task to be, we saw no differences in reported difficulty (1.85 vs. 1.79 for writers in the Receptive and Persuasive conditions, respectively, $\Delta M = 0.06$, 95% CI $[-0.09, 0.21]$, $t(654) = 0.80$, $p = .426$). Furthermore, when we asked participants how willing they would be to use the same communication style in the future, participants in the Receptive condition reported higher willingness to use this communication style than did participants in the Persuasive condition (3.78 vs. 3.57, $\Delta M = 0.21$, 95% CI $[0.07, 0.35]$, $t(654) = 2.93$, $p = .003$) who were using their own natural writing style. This result suggests that participants recognized the benefits of the intervention and did not find the

implementation overly challenging.

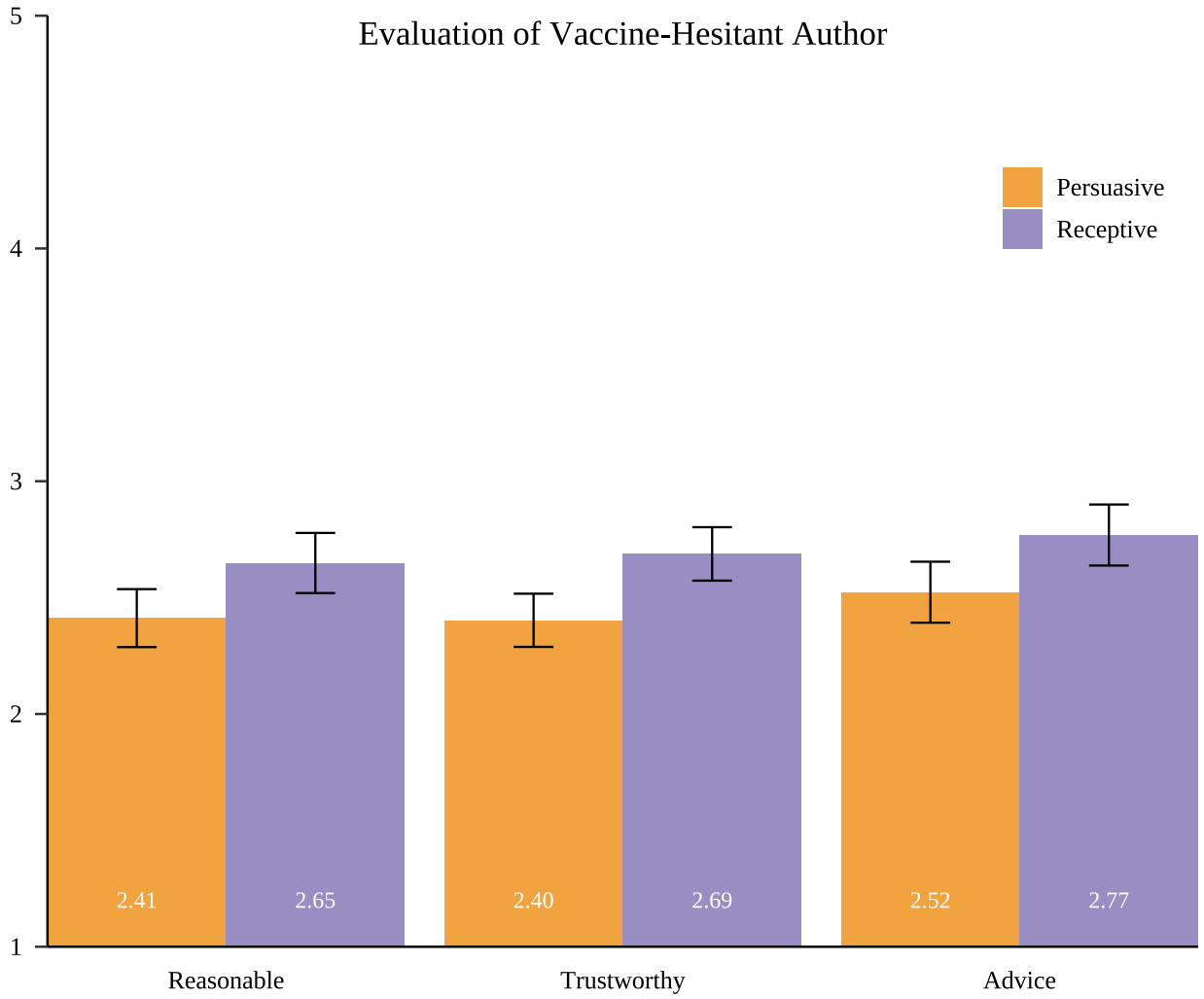

Figure 3. Study 2. Vaccine-supportive participants formed more favorable impressions of the author expressing vaccine hesitancy after they responded in a receptive style. Moreover, they were more willing to get that person's advice on an unrelated topic. Error bars show 95% confidence intervals.

Next, we turn to the vaccine-hesitant participants who evaluated the responses to their own, individual reasons for hesitancy (Figure 4). Participants who received a response from an author in the Receptive condition evaluated that person as more trustworthy than did those in the Persuasive condition (2.95 vs. 2.63, $\Delta M = 0.33$, 95% CI $[0.14, 0.51]$, $t(486) = 3.52$, $p < .001$), and as more reasonable (3.35 vs. 2.98, $\Delta M = 0.37$, 95% CI

$[0.17, 0.57]$, $t(486) = 3.72$, $p < .001$). Importantly, they were also more willing to get that person's advice on another topic (3.10 vs. 2.79, $\Delta M = 0.31$, 95% CI $[0.10, 0.53]$, $t(485) = 2.86$, $p = .004$).

Finally, as in prior studies, when we asked participants whether they were more or less willing to get vaccinated than before, we again did not observe differences by condition ($\Delta M = 0.01$, 95% CI $[-0.21, 0.22]$, $t(486) = 0.08$, $p = .937$)), again confirming the robustness of the beliefs people hold about vaccination.

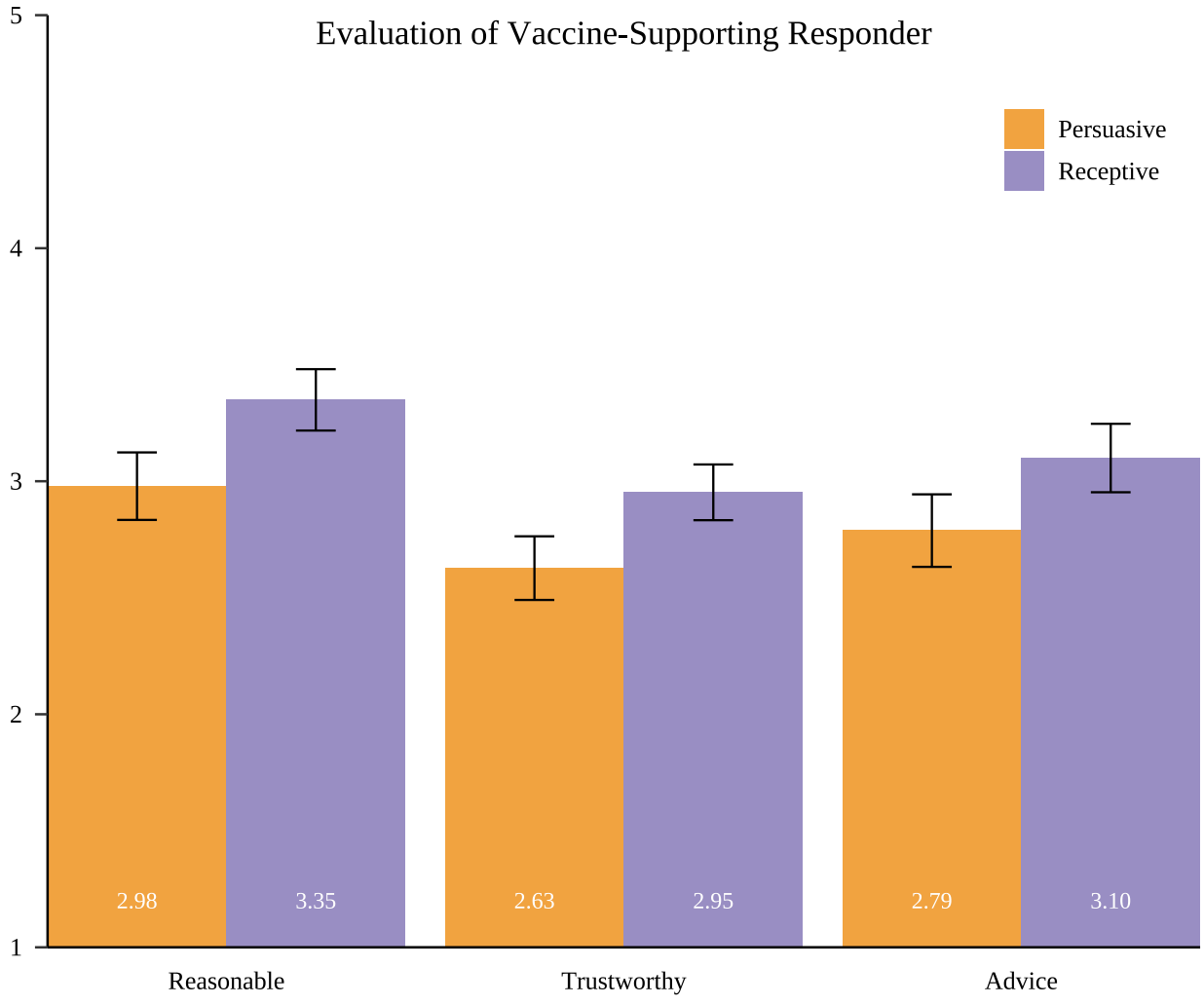

Figure 4. Study 2. Vaccine-hesitant participants evaluated vaccine-supportive authors who responded to their concerns more favorably when those authors were trained in conversational receptiveness. Error bars show 95% confidence intervals.

As with Study 1, our data allow us to examine whether the language used in the vaccine-supportive messages statistically mediates the differences in writer evaluations observed between conditions. To conduct this analysis, we again created an index of writer evaluations by averaging the ratings of writer reasonableness and writer trustworthiness ($\alpha_{\text{Index}} = 0.87$). When we regress this index on condition, we see a robust effect of condition assignment on writer evaluations ($b = 0.35$, 95% CI $[0.17, 0.52]$, $t(486) = 3.86$, $p < .001$). When we add the receptiveness of the message to the regression, we see that message receptiveness becomes a significant predictor of writer evaluations ($b = 0.32$, 95% CI $[0.07, 0.57]$, $t(485) = 2.53$, $p = .012$), and the effect of condition falls below the level of statistical significance ($b = 0.16$, 95% CI $[-0.06, 0.39]$, $t(485) = 1.43$, $p = .154$). Estimating the effect sizes in the mediation model reveals a direct effect of condition on writer evaluations of 0.16, and an indirect effect through message receptiveness of 0.11, suggesting that 40% of the total treatment effect on writer evaluations is mediated by the words and phrases in the messages. If we add willingness to take advice to the index of writer evaluations, the mediation results do not change in either direction or magnitude.

Discussion

Study 2 replicated our main findings, showing that both participants in a contentious discussion saw the other side more positively after one party has been trained in conversational receptiveness. Beyond seeing counterparts as more reasonable and more trustworthy, participants were also more willing to engage with their counterpart on another topic. This last finding is important because it speaks to one of the key theorized benefits of demonstrating receptiveness—paving the way for future conversations.

Importantly, our pattern of results persisted when vaccine-supportive participants responded to the authentic and varied concerns of the vaccine-hesitant. Furthermore, we again saw that these results emerged from a training in conversational receptiveness that lasted only a couple of minutes. Despite the brevity of the training, the vaccine supportive

participants did not report greater difficulty in implementing this style than their Persuasive condition counterparts who were able to communicate as they naturally do. Furthermore, the participants who used conversational receptiveness reported greater willingness to use this style again in the future.

Study 3: Live Conversation

The asynchronous nature of the previous studies provided participants with time to carefully craft their messages. But conversational receptiveness may be harder to deploy in real time. To test whether our results persist in live conversation, in Study 3 we engaged participants in a live, 15-minute conversation using a chat platform.

Moreover, we examine two reasons for why participants signaling receptiveness are evaluated more positively than are those attempting to be persuasive. It may be the case that conversational receptiveness creates a positive experience by letting counterparts feel heard. Alternatively, persuasion attempts may be particularly aversive, harming the evaluation of those participants. In Study 3, we deal with this question in two ways. First, vaccine supportive participants in both conditions received instructions to be persuasive, with one condition receiving additional instructions to also be receptive. Second, we added a third, untreated control condition to evaluate the effects of having any conversation at all.

Method

We recruited participants on Prolific Academic and screened them based on self-reported vaccination status. Due to the increasing levels of vaccination uptake, we expanded the criterion of "hesitancy" to include people who had received the original course of the vaccination but decided not to receive the booster dose. Specifically, we considered a participant to be fully up to date on their vaccine sequence (and hence "vaccine-supportive") if they had received 2 doses of the Johnson & Johnson vaccine, 3

doses of either the Pfizer or Moderna vaccines, or 1 dose Johnson & Johnson and 2 doses of Pfizer/Moderna. We also asked fully vaccinated participants how strongly they felt that everyone should be fully vaccinated against COVID-19 using a scale from "Not at all" to "Very."

Participants who were fully up to date and thought that it was "Very" important for everyone to be vaccinated were then randomly assigned to one of two treatment conditions. In the Persuasive condition, we instructed them to try to be maximally persuasive with the following instructions: "Try to think of the best arguments that you can for why people should get vaccinated. For example, you may want to strongly state that you think the vaccine is effective and safe. You may also want to correct common misperceptions and myths circulating about the vaccine." We also told them that the 20 participants who were most persuasive would qualify for a $50 lottery at the end of the study.

In the Persuasive+Receptive condition, participants received the same instructions and incentive to be persuasive. Additionally, they received instruction in conversational receptiveness. We told these participants that, at the end of the study, their level of receptiveness would be evaluated by an algorithm and the 20 participants who expressed the highest level of receptiveness would qualify for an entry into an additional lottery for $50. Adding instructions to be persuasive to the Receptive condition enabled us to eliminate an alternative explanation for our earlier results—namely that receptive participants were better liked because they were not trying hard enough to be persuasive and it was the aversiveness of attempts at persuasion that drove our results.

Participants who reported not being fully up to date on their vaccine sequence (fully unvaccinated, having received one dose, or two doses) answered an additional question regarding their willingness to get the next dose on a scale from "Not at all willing" to "Very willing." Those who did not respond that they were "Very willing" to get the next shot in the sequence were then randomly assigned to one of three experimental conditions:

Persuasive, Persuasive+Receptive, and an Untreated Control.

The vaccine-hesitant participants assigned to the Persuasive and Persuasive+Receptive conditions were paired with a vaccine-supportive participant assigned to the same condition. These pairs then engaged in a 15-minute-long conversation using ChatPlat, an online chat platform that we embedded in a Qualtrics survey. We told vaccine-hesitant participants that the discussion would concern a "controversial social issue," but we did not specify that the issue would be vaccines. At the conclusion of the conversation, all participants (both the vaccine-supportive and the vaccine-hesitant) reported how trustworthy and reasonable their conversation partner seemed, how willing they would be to get the person's opinion on another topic, and how unpleasant the conversation was. Participants reported their views using a 5-point Likert scales from "Not at All" to "Extremely."

The vaccine-hesitant participants in the Untreated Control condition received the following instructions: "Imagine having a conversation with a person who believes that it is very important that everyone is fully up to date on their vaccines. Imagine this person is trying to persuade you of their point of view." Participants then responded to the same scales regarding their imagined conversation.

At the end of the study, all participants saw descriptions of four websites related to the COVID-19 vaccines. The websites (1) provided a way to schedule vaccination, (2) provided information about the authorized vaccines, (3) showed how the various COVID vaccines differed, and (4) listed financial incentives and lotteries available to those getting vaccinated. Participants made binary choices about whether they wanted to be forwarded to each of the four websites. Finally, they reported how worried they were about safety and efficacy of the vaccine using 5-point Likert scales, from "Not at all worried" to "Extremely worried." We counterbalanced the order of the last two measures.

Results

A research assistant blind to condition read the conversation transcripts to ensure that both participants actively participated and stayed on topic. The full details of our preregistered recruitment and randomization procedure can be found in the online Supplemental Information. Our sample size following exclusions consisted of 570 conversations (1121 participants). 256 receivers and 260 persuaders in the Persuasive condition; 305 receivers and 300 persuaders in the Persuasive+Receptive condition, and 312 unpaired participants in the Untreated Control condition (61.13% Female, M_{age}=35.45).

As in prior studies, we examined the level of conversational receptiveness exhibited by our trained participants. We saw that Persuaders in the Persuasive+Receptive condition produced language that was significantly more receptive as evaluated by our algorithm than participants in the Persuasive condition (0.79 vs. 0.23, $\Delta M = 0.56$, 95% CI $[0.44, 0.68]$, $t(558) = 9.45$, $p < .001$). That is, after brief online training, participants were able to deploy conversational receptiveness in a real-time interaction.

We first compared the impressions that the vaccine-supportive Persuaders formed regarding their vaccine-hesitant counterparts. Persuaders in the Persuasive+Receptive condition found their vaccine-hesitant counterparts to be marginally more reasonable (3.67 vs. 3.49, $\Delta M = 0.18$, 95% CI $[-0.01, 0.37]$, $t(558) = 1.85$, $p = .065$), and directionally more trustworthy (3.39 vs. 3.25, $\Delta M = 0.14$, 95% CI $[-0.04, 0.33]$, $t(558) = 1.54$, $p = .124$) than did Persuaders in the Persuasive condition. It is notable that these effects are smaller than in our prior studies. It is possible that the effect of conversational receptiveness on the Persuaders diminishes over multiple rounds of conversation, that it requires the greater deliberation time afforded by asynchronous communication, or that having an explicit persuasion goal made participants frustrated with their apparent lack of persuasive success.

When considering the vaccine-hesitant persuasion targets, we replicate the results of our prior studies showing that again, even in an ongoing conversation where individuals

had no opportunity to carefully craft their messages, our brief conversational receptiveness intervention led to more positive evaluations on the part of the vaccine-hesitant participants. Vaccine-hesitant Receivers in the Persuasive+Receptive condition found their counterparts to be more reasonable (4.13 vs. 3.83, $\Delta M = 0.31$, 95% CI $[0.15, 0.47]$, $t(559) = 3.79$, $p < .001$), and more trustworthy (3.73 vs. 3.46, $\Delta M = 0.26$, 95% CI $[0.10, 0.42]$, $t(559) = 3.27$, $p = .001$) than participants in the Persuasive condition. These participants were also directionally more willing to hear their opinions on other topics (3.98 vs. 3.84, $\Delta M = 0.14$, 95% CI $[-0.03, 0.31]$, $t(559) = 1.61$, $p = .107$), and reported the conversation to be marginally less unpleasant (1.29 vs. 1.41, $\Delta M = 0.12$, 95% CI $[-0.02, 0.25]$, $t(559) = 1.74$, $p = .083$).

As in the earlier studies, we can conduct a mediation analysis to examine the extent to which the positive interpersonal evaluations that we observed were driven by the level of conversational receptiveness exhibited by the vaccine-supportive participants. We again create an interpersonal evaluation index by taking the average of the vaccine-hesitant participants' evaluations of the trustworthiness and reasonableness of their vaccine-supportive counterparts. When we regress this interpersonal evaluation index ($\alpha_{\text{Index}} = 0.82$) on condition, we again see strong evidence of our treatment ($b = 0.26$, 95% CI $[0.12, 0.41]$, $t(549) = 3.54$, $p < .001$). As reported earlier, receptiveness differs by condition. When we add the level of receptiveness exhibited by the Persuader during the conversation into the model, we observe a significant effect of conversational receptiveness on interpersonal evaluations ($b = 0.22$, 95% CI $[0.12, 0.33]$, $t(548) = 4.28$, $p < .001$). The effect of condition decreases and drops below significance ($b = 0.13$, 95% CI $[-0.02, 0.29]$, $t(548) = 1.69$, $p = .091$). Estimating the effect sizes in the mediation model reveals a direct effect of condition on evaluations of 0.13, and an indirect effect through message receptiveness of 0.06, suggesting that approximately 31% of our condition effect was mediated by the language used by the vaccine-supportive participants.

Importantly, this study allowed us to examine not only the difference in outcomes

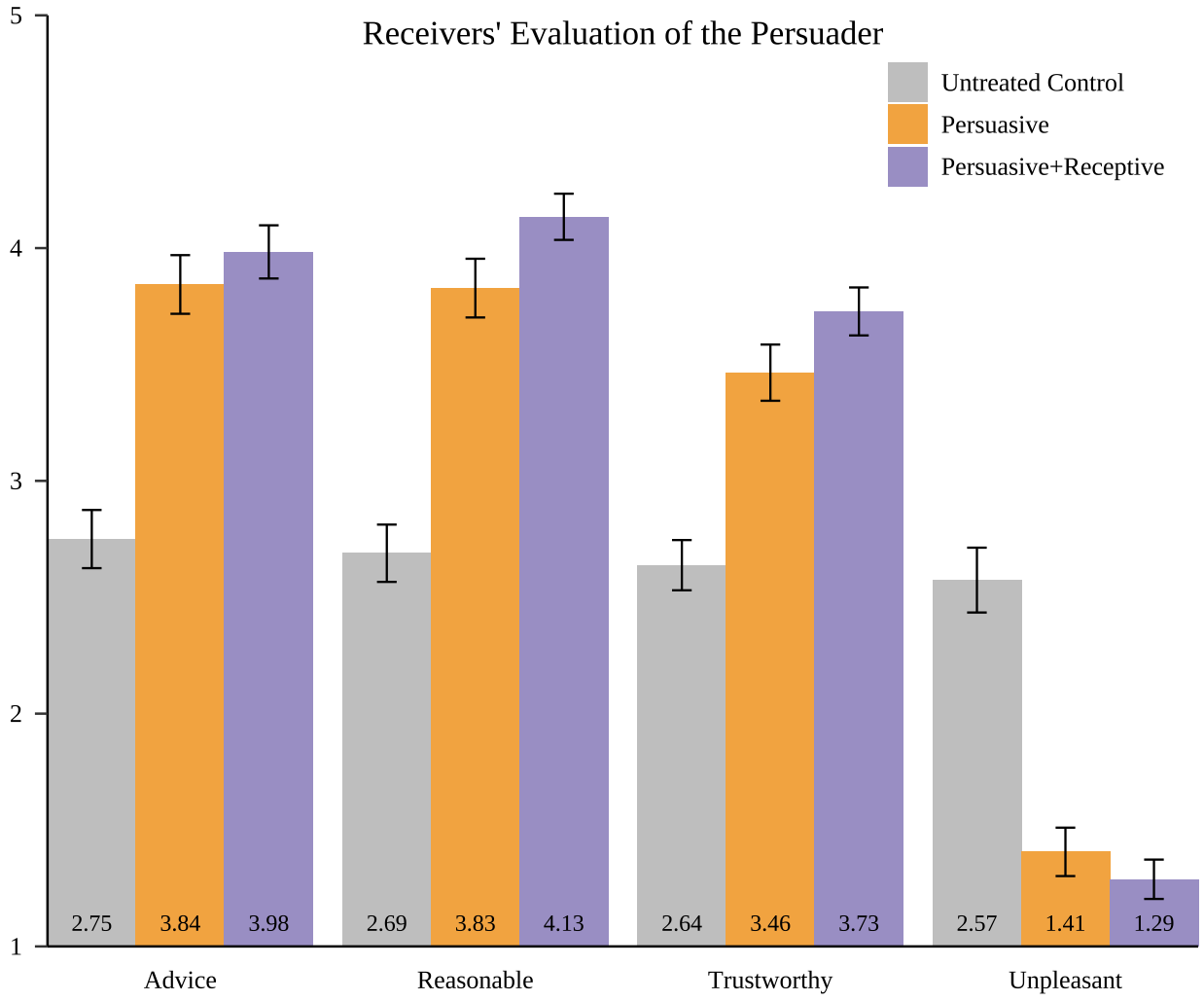

Figure 5. Study 3. Vaccine-hesitant participants who had a conversation with someone who was incentivized to appear receptive evaluated that person as more trustworthy and more reasonable. They were also marginally more willing to get their advice on another topic and thought the conversation was directionally less unpleasant. Participants who merely imagined having the conversation expected their counterparts to appear less reasonable and less trustworthy and the conversation to be more unpleasant than those who experienced the interaction. Error bars show 95% confidence intervals.

between interactions featuring more versus less conversational receptiveness, but also how the outcomes of the actual interaction differ from expectations of the vaccine hesitant participants reported in the Untreated Control condition. Figure 5 makes it clear that across both Persuasive and Persuasive+Receptive conditions, participants' experience far exceeded the expectations reported by people who merely imagined the conversation. In other words, even participants who interacted with counterparts instructed to persuade them had a far better experience than the one they imagined. These data suggest that one reason individuals are avoiding vaccine conversations may be due to an erroneous forecast of their conversational experience (Dorison, Minson, & Rogers, 2019; Wilson & Gilbert, 2005). They also suggest that given that these conversations did exceed expectations, efforts should be made to encourage people to converse more frequently.

Finally, we can examine the participants' rate of requesting to be forwarded to websites providing accurate vaccine information. Participants in the Untreated Control condition, who did not interact with a partner, asked to be forwarded to an average 0.51 of the four websites we presented. Participants in the Persuasive condition asked to be forwarded to an average of 0.53 websites. Finally, participants in the Persuasive+Receptive condition asked to be forwarded to an average of 0.63 websites (for all direct comparisons, $p > 0.16$).

Although the differences between the Persuasive and Persuasive+Receptive condition are directionally in line with our predictions, they did not reach statistical significance. However, a post-hoc analysis did show that there was a significant difference between the two conditions which featured conversation and the Untreated Control condition ($\Delta M = 0.17$, 95% CI $[0.03, 0.30]$, $t(521.65) = 2.42$, $p = .016$). This final result is further supportive of the idea that one goal of conversational interventions should be simply to encourage future contact. Finally, as in prior studies, we saw no between condition differences in concern with the safety and efficacy of the vaccines.

Discussion

Study 3 replicates the interpersonal benefits of receptiveness training during a live 15-minute conversation with participants having little time to craft their messages. Furthermore, participants in both conversation conditions received instructions to be persuasive, creating a more stringent test of the interpersonal benefits of receptiveness. Importantly, we find that vaccine-hesitant participants evaluated their counterpart in the Persuasive+Receptive condition more favorably, and both conversation conditions far outperformed the expectations of participants who merely imaged having a conversation. These results suggest that it is not the aversiveness of persuasion attempts that drove our earlier results, but that adding markers of conversational receptiveness to persuasion attempts does improve interpersonal evaluations.

Study 4: Willingness to Converse

Across our studies, conversational receptiveness improved the quality of contentious conversations by making both parties see each other as more trustworthy and more reasonable. Participants were also more willing to solicit their counterparts' advice on other topics. However, contrary to our predictions and prior research, we saw no change in vaccine attitudes or willingness to get vaccinated. This is likely to be the case because beliefs about medical decisions are carefully considered and hence unlikely to shift. Indeed, if attitude change were ever to take place on such topics, it is likely to require many encounters over a period of time. Because conversational receptiveness made the interactions less unpleasant and left participants with more positive evaluations of each other, the primary benefit of this approach may be to preserve sufficient good will for future dialogue to take place. Study 4 thus specifically tests the effect of receptiveness training on willingness to engage in future vaccine discussions.

Method

Following our previous designs, we used a screener survey to ask participants about their COVID-19 vaccination status. Those who were not up to date on their vaccinations were then asked how willing they are to receive the recommended doses, while those who were up-to-date were asked about how important it is that others are as well. We used quotas in the Qualtrics platform to target 150 vaccine-supportive participants (recruiting 155), and 150 vaccine-hesitant participants (recruiting 151).

Participants reported how unpleasant it would be to have a conversation with someone who held an opposing view on vaccination and how willing they would be to have such a conversation (both on six-point Likert scales ranging from "Not at all" to "Extremely"). All participants answered these two questions at three different timepoints: at the beginning of the survey without any additional information (Pre-Training), after learning about conversational receptiveness and considering engaging with someone who had not received the same information (Self-Trained), and after learning about conversational receptiveness and considering engaging with someone who also received identical information (Both-Trained). We counterbalanced the order of the last two questions (Self-Trained and Both-Trained) and, following our preregistration, collapse our analyses across the orderings.

We hypothesized that people would anticipate a conversation with a counterpart who was trained in conversational receptiveness to be less unpleasant than with someone who was untrained, and that they would be more willing to have such a conversation. However, conversations require both parties to be willing to engage. Thus, our key dependent variable in this study is the fraction of times a conversation between a vaccine-supportive and a vaccine-hesitant participant would occur when neither, one, or both parties receive information about conversational receptiveness. To construct this variable, we simulated matches between each participant and every possible counterpart who has a view opposite

to their own and calculated the percentage of matches when both were willing to have a conversation (a response of 4-6 on the Likert scale). This measure accounts for the possibility that a person on one side of the issue might remain unwilling to have a conversation and hence fewer conversations would occur.

Results

As we hypothesized, when both parties were trained in receptiveness participants anticipated the conversation to be less unpleasant than when neither party received training (2.37 vs. 3.16, $M_D = 0.79$, 95% CI $[0.64, 0.94]$, $t(305) = 10.20$, $p < .001$), and also when only the focal participant, but not their conversation partner, had received training (2.37 vs. 3.08, $M_D = 0.71$, 95% CI $[0.58, 0.85]$, $t(305) = 10.27$, $p < .001$, left panel of Figure 6). We did not make a prediction regarding the difference between absence of training and the scenario where only the evaluator (but not their partner) had been trained, and find no difference in anticipated outcomes (3.16 vs. 3.08, $M_D = 0.08$, 95% CI $[-0.07, 0.23]$, $t(305) = 1.04$, $p = .301$). Thus, our results suggest that to observe increases in positive expectations regarding vaccine conversations, individuals need to believe that their counterpart is likely to reciprocate their receptive style.

Although we did not make a prediction about differences between vaccine-supportive and vaccine-hesitant participants, we find that the vaccine-hesitant expected the conversation to be consistently more pleasant than the vaccine-supportive (3.78 vs. 2.55, $\Delta M = 1.23$, 95% CI $[0.89, 1.56]$, $t(304) = 7.26$, $p < .001$ pre-training, 3.40 vs. 2.77, $\Delta M = 0.64$, 95% CI $[0.33, 0.95]$, $t(304) = 4.03$, $p < .001$ when only the participant is trained, and 2.60 vs. 2.14, $\Delta M = 0.46$, 95% CI $[0.17, 0.75]$, $t(304) = 3.08$, $p = .002$ when both are trained). These results may stem from the negative stereotypes of the vaccine-hesitant that have characterized vaccine discourse. Future research should examine whether negative meta-perceptions have a role in preventing vaccine discussions similarly to other politicized topics (Lees & Cikara, 2020).

The results regarding participants' willingness to engage in the conversation paralleled the results regarding the anticipated unpleasantness of the conversation. Specifically, when both participants imagined being trained in conversational receptiveness, they were most willing to talk about vaccines to a disagreeing counterpart (4.42 vs. 3.84, $M_D = 0.58$, 95% CI $[0.47, 0.68]$, $t(305) = 10.56$, $p < .001$ compared to before learning about conversational receptiveness, and 4.42 vs. 3.96, $M_D = 0.45$, 95% CI $[0.35, 0.56]$, $t(305) = 8.51$, $p < .001$ when only the focal participant was trained). Furthermore, we observed a small but statistically significant increase in willingness to have the conversation in the self-trained vs. pre-training scenarios (3.96 vs. 3.84, $M_D = 0.12$, 95% CI $[0.01, 0.23]$, $t(305) = 2.18$, $p = .030$).

The results regarding participants' willingness to engage in the conversation paralleled the results regarding the anticipated unpleasantness of the conversation. Specifically, when both participants imagined being trained in conversational receptiveness, they were the most willing to talk about vaccines to a disagreeing counterpart (right panel of Figure 6). To do this, we binarized the 6-point Likert scale, categorizing participants as being either willing or unwilling to have a conversation. We then matched each participant with every participant holding the opposing view to determine how often the conversation would occur. For "Pre-Training," we used both participants' responses prior to learning about conversational receptiveness. For "Self-Training," we used the focal participant's response in that scenario and the other participant's response from "Pre-Training." Finally, for "Both-Trained," we used both participants' responses in the scenario where both had been trained in receptiveness.

As we predicted, conversations were most likely to occur when both participants had been trained in conversational receptiveness (67% vs. 41%, $M_D = 0.26$, 95% CI $[0.23, 0.30]$, $t(305) = 14.72$, $p < .001$ comparing Both-Trained to Pre-Training, and 67% vs. 43%, $M_D = 0.24$, 95% CI $[0.21, 0.28]$, $t(305) = 13.53$, $p < .001$ to Self-Trained). We did not make a prediction regarding the difference between Pre-Training and Self-Training and found no

difference in how frequently such conversations would be expected to occur ($M_D = 0.02$, 95% CI $[-0.01, 0.05]$, $t(305) = 1.44$, $p = .150$). These analyses provide us a readily interpretable measure of effect size: conversations would occur 50% more frequently if both participants were trained in conversational receptiveness than when either only one or neither party were trained.

Finally, we can examine the composition of those willing to enter the conversation. Prior to learning about conversational receptiveness, we found that men were significantly more willing to have the conversation than women and those who identified as another gender (4.07 vs. 3.65, $\Delta M = 0.49$, 95% CI $[0.21, 0.77]$, $t(304) = 3.43$, $p < .001$). After learning about conversational receptiveness, however, this gender difference was largely attenuated (4.08 vs. 3.90, $\Delta M = 0.25$, 95% CI $[-0.03, 0.52]$, $t(304) = 1.76$, $p = .079$ in Self-Trained, and 4.50 vs. 4.39, $\Delta M = 0.17$, 95% CI $[-0.10, 0.43]$, $t(304) = 1.23$, $p = .221$ when both are trained). This final, post-hoc analysis suggests that explicit instruction in conversational receptiveness may be particularly helpful to groups which may be less eager for cultural or structural reasons to engage in advocacy or confrontation.

General Discussion

Vigorous discussion of contradictory ideas is necessary for both daily decision making and the very fabric of democracy. In recent years, particularly bitter divisions have emerged around topics at the intersection of personal behavior, values, and science (environmentalism, gun ownership, vaccination, gender identity) with both sides futilely seeking to convince the other of their own intellectual superiority and unique access to the moral high ground.

We show that brief instruction in conversational receptiveness successfully induces people to use language associated with thoughtful consideration of opponents' views, resulting in less divisive conversations. This effect is bidirectional with both those signaling

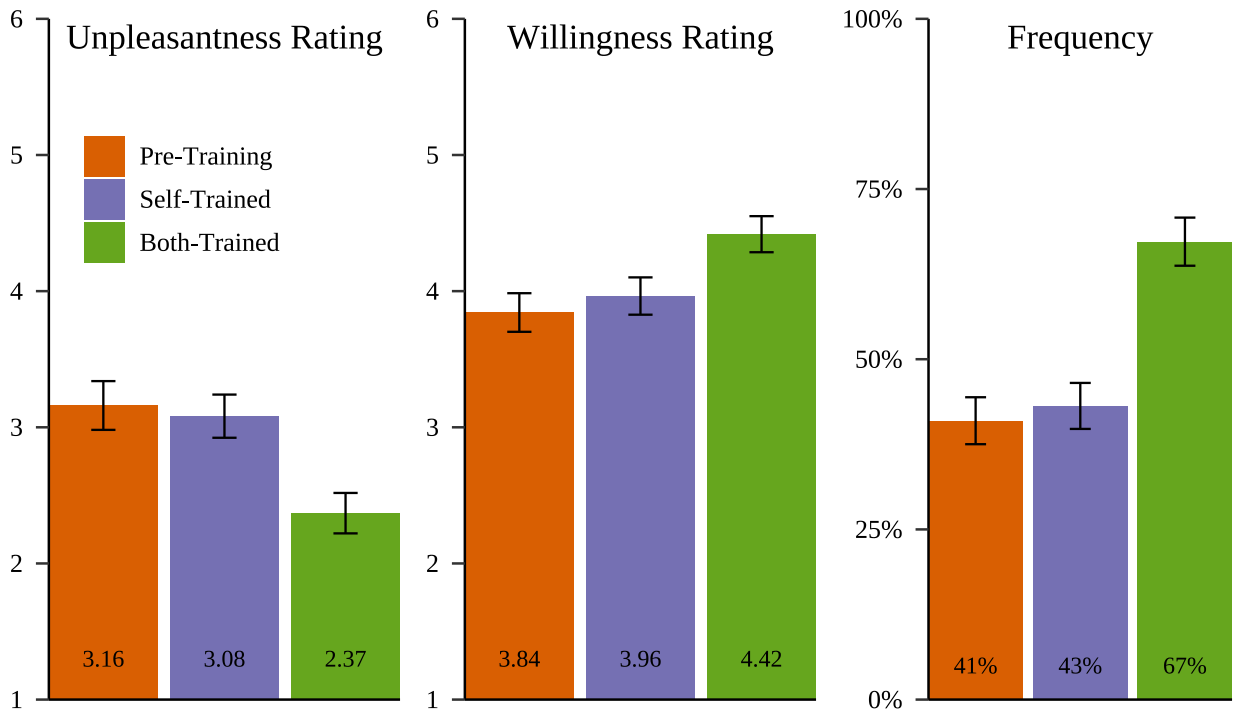

Figure 6. Study 4. When participants imagined that they and their counterpart had been trained in conversational receptiveness, they expected conversations on vaccination to be less unpleasant (left panel) and were more willing to engage in them (center panel). Consequently, the likelihood that both parties were willing to engage in a conversation was 50% higher when both participants were trained (right panel). Error bars show 95% confidence intervals.

and those receiving receptiveness evaluating counterparts as being more trustworthy and reasonable, and being more willing to get each other's advice on other topics. Importantly, we did not observe receptiveness to lead to any greater or lesser attitude change than the control condition in which participants were instructed to simply be as persuasive as possible. Although based on the prior literature, we predicted that receptiveness would be more persuasive, this outcome is perhaps not surprising given the highly contentious topic of disagreement addressed in our investigation.

In our experiments (as in many prior studies), individuals were compelled to communicate with those who hold opposing views by virtue of signing up to participate in the research. In the real world, difficult conversations that can easily lead to conflict can

simply be avoided. Thus, one potential outcome that individuals should care about is the extent to which any one communication approach increases the chances of future dialogue. In our Study 3, we saw that both groups that engaged in discussion reported experiences that were far more pleasant than a group that merely imagined conversation. Furthermore, the discussion groups appeared slightly more willing to consume accurate information about vaccines. These results underscore the importance of developing interventions that encourage dialogue rather than avoidance of contentious topics. Our final study suggests that conversational receptiveness may serve as such an intervention. Specifically, we find that participants correctly anticipate that receptiveness training improves conversations, increasing the likelihood that both parties would be willing to engage in dialogue by 50%.

In sum, we find that when deployed in the course of conversations on one of the most divisive topics of the last several years, conversational receptiveness improves people's opinions about their counterparts, encourages future dialogue, and is no less effective at encouraging vaccination than direct persuasion efforts. Importantly, we found these results to consistently emerge across a variety of study designs, at different time points during the course of the pandemic, and for participants both trained and untrained in conversational receptiveness.

Overall, our findings contribute to the emerging literature on the multiple goals to which parties in communication might aspire (Collins, Dorison, Gino, & Minson, 2022; Yeomans et al., 2022). Although much of the prior work on disagreement focused on persuasion or compromise, there are many conversations where neither is a likely outcome. We suggest that we can advance psychological theory by examining additional goals that conversationalists in disagreement can pursue and the strategies that might serve them well. Although in our studies the deployment of conversational receptiveness did not change participant attitudes regarding the vaccine, this approach seemed to make it more likely that individuals will continue to engage in contact and discussion. Future research should thus explore what benefits such contact might have. Even if attitude change remains

an unattainable goal, could individuals learn to live in respectful disagreement? Could they find solutions that meet each of their goals without fundamentally changing their beliefs? Or will persuasion eventually take place, but only over the course of many conversations?

An immediate question that our work raises concerns the durability and robustness of our documented effects. How much training would it take to make conversational receptiveness one's default style? If one's counterparts were aware of the training, would the effects still emerge? Would individuals be able to maintain conversational receptiveness in the face of a protracted discussion or would they revert to a more argumentative default style? Although these questions might be difficult to answer because they would require engaging disagreeing parties in longer interactions, our promising results suggest that such exploration might be worthwhile.

One clear limitation of the present research is that it is based on algorithmic analyses of English text. It is possible that receptiveness may have different markers or lead to different outcomes in other language and/or other cultures. Although both of these possibilities are open empirical questions, the desire to feel heard and understood has been replicated across a variety of settings (Bruneau & Saxe, 2012; Collins et al., 2022; Roos, Postmes, & Koudenburg, 2021). Thus we suspect that although different languages might express receptiveness differently, the broad idea that expressing engagement with opposing views leads to more positive outcomes seems to be quite common.

In sum, our work highlights the importance of a variety of interpersonal outcomes in the course of conflictual dialogue. While persuasion is of clear importance, it is also clear that individuals on opposite sides of contentious issues are highly motivated to maintain relational harmony and avoid aversive interactions, with these motivations powerfully affecting the decision to enter a conversation. Building a culture of effective disagreement requires evidence-based interventions to support those who are willing to cross the divide.

Constraints on Generality

Our studies included English-speaking participants enrolled in online research pools. Thus, we are aware that we engaged individuals from a particular cultural background and at a particular level of technological sophistication. Nevertheless, we have several reasons to believe that our results would generalize quite broadly. First, our participants made similar arguments for and against COVID-19 vaccines as documented by a variety of media sources and anecdotal reports from healthcare providers. In other words, we do not believe that the reasoning we captured was any more or less sophisticated than that which is typical in the general American population. Second, the basic premise of conversational receptiveness – that people in disagreement want to feel heard and engaged with – has been demonstrated in a variety of cultural contexts (e.g., Bruno & Saxe, 2012; Collins, Dorison, Gino & Minson, 2022). Of course, the clearest way to express one's engagement is likely to differ by culture and language, and we look forward to future research addressing this question.

References

Abelson, R. P. (1988). Conviction. *American Psychologist*, *43*(4), 267–275. https://doi.org/10.1037/0003-066X.43.4.267

Blankenship, K. L., & Craig, T. Y. (2007). Language and persuasion: Tag questions as powerless speech or as interpreted in context. *Journal of Experimental Social Psychology*, *43*(1), 112–118. https://doi.org/10.1016/j.jesp.2005.12.012

Bohner, G., Einwiller, S., Erb, H., & Siebler, F. (2003). When Small Means Comfortable: Relations Between Product Attributes in Two-Sided Advertising. *Journal of Consumer Psychology*, *13*(4), 454–463. https://doi.org/10.1207/S15327663JCP1304_12

Brehm, J. W. (1966). *A theory of psychological reactance*. Oxford, England: Academic Press.

Broockman, D., & Kalla, J. (2016). Durably reducing transphobia: A field experiment on door-to-door canvassing. *Science*, *352*(6282), 220–224. https://doi.org/10.1126/science.aad9713

Broomfield, N. M., Laidlaw, K., Hickabottom, E., Murray, M. F., Pendrey, R., Whittick, J. E., & Gillespie, D. C. (2011). Post-stroke depression: The case for augmented, individually tailored cognitive behavioural therapy. *Clinical Psychology & Psychotherapy*, *18*(3), 202–217. https://doi.org/10.1002/cpp.711

Brown, J. R., & Enos, R. D. (2021). The measurement of partisan sorting for 180 million voters. *Nature Human Behaviour*, *5*(8), 998–1008. https://doi.org/10.1038/s41562-021-01066-z

Bruneau, E. G., & Saxe, R. (2012). The power of being heard: The benefits of "perspective-giving" in the context of intergroup conflict. *Journal of Experimental Social Psychology*, *48*(4), 855–866. https://doi.org/10.1016/j.jesp.2012.02.017

Burke, B. L., Arkowitz, H., & Menchola, M. (2003). The efficacy of motivational interviewing: A meta-analysis of controlled clinical trials. *Journal of Consulting and Clinical Psychology*, *71*, 843–861. https://doi.org/10.1037/0022-006X.71.5.843

CDC COVID-19 Response Vaccine Task Force. (2021). *Building Confidence in COVID-19 Vaccines Among Your Patients*. Retrieved from https://www.cdc.gov/vaccines/covid-19/downloads/vaccinatewconfidence-tipsforhcteams_508.pdf

Chen, F. S., Minson, J. A., & Tormala, Z. L. (2010). Tell me more: The effects of expressed interest on receptiveness during dialog. *Journal of Experimental Social Psychology*, *46*(5), 850–853. https://doi.org/10.1016/j.jesp.2010.04.012

Cialdini, R. B., Lasky-Fink, J., Demaine, L. J., Barrett, D. W., Sagarin, B. J., & Rogers, T. (2021). Poison Parasite Counter: Turning Duplicitous Mass Communications Into Self-Negating Memory-Retrieval Cues. *Psychological Science*, *32*(11), 1811–1829. https://doi.org/10.1177/09567976211015182

Collins, H. K., Dorison, C. A., Gino, F., & Minson, J. A. (2022). Underestimating Counterparts' Learning Goals Impairs Conflictual Conversations. *Psychological Science*, 09567976221085494. https://doi.org/10.1177/09567976221085494

Dorison, C. A., Minson, J. A., & Rogers, T. (2019). Selective exposure partly relies on faulty affective forecasts. *Cognition*, *188*, 98–107. https://doi.org/10.1016/j.cognition.2019.02.010

Finkel, E. J., Bail, C. A., Cikara, M., Ditto, P. H., Iyengar, S., Klar, S., … Druckman, J. N. (2020). Political sectarianism in America. *Science*, *370*(6516), 533–536. https://doi.org/10.1126/science.abe1715

Flores, R. D. (2017). Do Anti-Immigrant Laws Shape Public Sentiment? A Study of Arizona's SB 1070 Using Twitter Data. *American Journal of Sociology*, *123*(2), 333–384. https://doi.org/10.1086/692983

Graupmann, V., Jonas, E., Meier, E., Hawelka, S., & Aichhorn, M. (2012). Reactance, the self, and its group: When threats to freedom come from the ingroup versus the outgroup. *European Journal of Social Psychology*, *42*(2), 164–173. https://doi.org/10.1002/ejsp.857

Helfers, A., & Ebersbach, M. (2023). The differential effects of a governmental debunking campaign concerning COVID-19 vaccination misinformation. *Journal of Communication in Healthcare*, *16*(1), 113–121. https://doi.org/10.1080/17538068.2022.2047497

Heltzel, G., & Laurin, K. (2021). Seek and Ye Shall Be Fine: Attitudes Toward Political-Perspective Seekers. *Psychological Science*, *32*(11), 1782–1800. https://doi.org/10.1177/09567976211011969

Hussein, M. A., & Tormala, Z. L. (2021). Undermining Your Case to Enhance Your Impact: A Framework for Understanding the Effects of Acts of Receptiveness in

Persuasion. *Personality and Social Psychology Review*, *25*(3), 229–250. https://doi.org/10.1177/10888683211001269

Iyengar, S., & Westwood, S. J. (2015). Fear and Loathing across Party Lines: New Evidence on Group Polarization. *American Journal of Political Science*, *59*(3), 690–707. https://doi.org/10.1111/ajps.12152

Karmarkar, U. R., & Tormala, Z. L. (2010). Believe Me, I Have No Idea What I'm Talking About: The Effects of Source Certainty on Consumer Involvement and Persuasion. *Journal of Consumer Research*, *36*(6), 1033–1049. https://doi.org/10.1086/648381

Lees, J., & Cikara, M. (2020). Inaccurate group meta-perceptions drive negative out-group attributions in competitive contexts. *Nature Human Behaviour*, *4*(3), 279–286. https://doi.org/10.1038/s41562-019-0766-4

Mercier, H., & Sperber, D. (2011). Why do humans reason? Arguments for an argumentative theory. *Behavioral and Brain Sciences*, *34*(2), 57–74. https://doi.org/10.1017/S0140525X10000968

Milkman, K. L., Gandhi, L., Patel, M. S., Graci, H. N., Gromet, D. M., Ho, H., … Duckworth, A. L. (2022). A 680,000-person megastudy of nudges to encourage vaccination in pharmacies. *Proceedings of the National Academy of Sciences*, *119*(6), e2115126119. https://doi.org/10.1073/pnas.2115126119

Miller, W. R., & Rollnick, S. (2002). *Motivational interviewing: Preparing people for change, 2nd ed.* New York, NY, US: The Guilford Press.

Minson, J. A., Chen, F. S., & Tinsley, C. H. (2020). Why Won't You Listen to Me? Measuring Receptiveness to Opposing Views. *Management Science*, *66*(7), 3069–3094. https://doi.org/10.1287/mnsc.2019.3362

Minson, J. A., Yeomans, M., Collins, H. K., & Dorison, C. A. (2023). *Conversational receptiveness transmits between parties and bridges ideological conflict.* Working {Paper}, Harvard University.

Nyhan, B., Reifler, J., Richey, S., & Freed, G. L. (2014). Effective Messages in Vaccine Promotion: A Randomized Trial. *Pediatrics*, *133*(4), e835–e842. https://doi.org/10.1542/peds.2013-2365

Pavey, L. (2022). *Moral obligation, autonomous motivation, and COVID-19 vaccine hesitancy: Highlighting moral obligation increases reactance in hesitant individuals* [Conference]. Bristol, England. Retrieved from https://eprints.kingston.ac.uk/id/eprint/52685/

Petty, R. E., & Cacioppo, J. T. (1979). Issue involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses. *Journal of Personality and Social Psychology*, *37*(10), 1915–1926. https://doi.org/10.1037/0022-3514.37.10.1915

Reddinger, J. L., Levine, D., & Charness, G. (2022). Can targeted messages reduce COVID-19 vaccination hesitancy? A randomized trial. *Preventive Medicine Reports*, 101903. https://doi.org/10.1016/j.pmedr.2022.101903

Reich, T., & Maglio, S. J. (2020). Featuring Mistakes: The Persuasive Impact of Purchase Mistakes in Online Reviews. *Journal of Marketing*, *84*(1), 52–65. https://doi.org/10.1177/0022242919882428

Reschke, B., Minson, J. A., Bowles, H. R., De Vaan, M., & Srivastava, S. B. (2020).

Mutual Receptiveness to Opposing Views Bridges Ideological Divides in Network Formation. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3703958

Reynolds-Tylus, T. (2019). Psychological Reactance and Persuasive Health Communication: A Review of the Literature. *Frontiers in Communication*, *4*. Retrieved from https://www.frontiersin.org/articles/10.3389/fcomm.2019.00056

Roos, C. A., Postmes, T., & Koudenburg, N. (2021). Feeling heard: Operationalizing a key concept for social relations. *PsyArXiv*.

Ross, L., & Ward, A. (1995). Psychological Barriers to Dispute Resolution. In *Advances in Experimental Social Psychology* (Vol. 27, pp. 255–304). Elsevier. https://doi.org/10.1016/S0065-2601(08)60407-4

Santos, L. A., Voelkel, J. G., Willer, R., & Zaki, J. (2022). Belief in the Utility of Cross-Partisan Empathy Reduces Partisan Animosity and Facilitates Political Persuasion. *Psychological Science*, *33*(9), 1557–1573. https://doi.org/10.1177/09567976221098594

Schroeder, J., Kardas, M., & Epley, N. (2017). The Humanizing Voice: Speech Reveals, and Text Conceals, a More Thoughtful Mind in the Midst of Disagreement. *Psychological Science*, *28*(12), 1745–1762. https://doi.org/10.1177/0956797617713798

Silvia, P. J. (2005). Deflecting Reactance: The Role of Similarity in Increasing Compliance and Reducing Resistance. *Basic and Applied Social Psychology*, *27*, 277–284. https://doi.org/10.1207/s15324834basp2703_9

Sprengholz, P., Felgendreff, L., Böhm, R., & Betsch, C. (2022). Vaccination policy reactance: Predictors, consequences, and countermeasures. *Journal of Health Psychology*, *27*(6), 1394–1407. https://doi.org/10.1177/13591053211044535

Voelkel, J. G., Malik, M., Redekopp, C., & Willer, R. (2022). Changing Americans' Attitudes about Immigration: Using Moral Framing to Bolster Factual Arguments. *The ANNALS of the American Academy of Political and Social Science*, *700*(1), 73–85. https://doi.org/10.1177/00027162221083877

Wilson, T. D., & Gilbert, D. T. (2005). Affective Forecasting: Knowing What to Want. *Current Directions in Psychological Science*, *14*(3), 131–134. https://doi.org/10.1111/j.0963-7214.2005.00355.x

Yeomans, M., Kantor, A., & Tingley, D. (2019). The politeness Package: Detecting Politeness in Natural Language. *The R Journal*, *10*(2), 489. https://doi.org/10.32614/RJ-2018-079

Yeomans, M., Minson, J. A., Collins, H., Chen, F., & Gino, F. (2020). Conversational receptiveness: Improving engagement with opposing views. *Organizational Behavior and Human Decision Processes*, *160*, 131–148. https://doi.org/10.1016/j.obhdp.2020.03.011

Yeomans, M., Schweitzer, M. E., & Brooks, A. W. (2022). The Conversational Circumplex: Identifying, prioritizing, and pursuing informational and relational motives in conversation. *Current Opinion in Psychology*, *44*, 293–302. https://doi.org/10.1016/j.copsyc.2021.10.001