Not every story has two sides: the effect of false balance on perceived scientific consensus about interrogation practices

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Abstract

Purpose – *This study aims to test the effect of a falsely balanced message (i.e. exposure to two opposing arguments) on perceived expert consensus about an interrogation practice.*

Design/methodology/approach – *Participants (*N = *254) read a statement about minimization tactics and were assigned randomly to one of four conditions, where true expert consensus about the tactic was either presented as high or low, and a balanced message (i.e. read two opposing arguments about the factual nature of the tactic) was present or absent.*

Findings – *Results showed that exposure to balanced messages led to less perceived expert consensus; especially when true expert consensus about the tactic was high. Exposure to balanced messages also reduced public support for experts testifying about the interrogation tactic.*

Research limitations/implications – *Such findings suggest that pairing expert knowledge (i.e. empirical evidence) about investigative interviewing issues with denials might be powerful enough to override scientific beliefs about important matters in this field.*

Originality/value – *Researchers in the field of investigative interviewing have put much effort into developing evidence-based interviewing practices and debunking misconceptions on the field. While knowledge mobilization is particularly important in this consequential, applied domain, there are some individuals who aim to hinder the advancement and reform of investigative interviewing. Falsely balancing scientific findings (e.g. minimization tactics imply leniency) with denials is but one of many practices that can distort the public's perception of expert consensus on an issue. It is crucial for investigative interviewing researchers to recognize such strategies and develop ways to combat science denialism.*

Keywords *False balance, Perceived expert consensus, Science communication, Minimization tactics, Confessions, Expert testimony*

Paper type *Research paper*

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With a long history of empirical research, psychology and law researchers have achieved scientific consensus on a range of pertinent issues. For instance, there is expert consensus that innocent people can confess to crimes they did not commit (Gudjonsson, 2021; Kassin *et al.*, 2010), psychologically coercive police interrogations put suspects at risk of falsely confessing (Kassin *et al.*, 2018), misinformation can alter a person's memory of an event (Loftus and Klemfuss, 2023), children as young as age 4 can recall information accurately (Sims and Morton, 2021), nonverbal human behavior is a poor predictor of deception (Luke *et al.*, 2023) and longer sentences lead to higher recidivism (Gendreau, *et al.*, 1999). Issues that have received expert consensus have naturally led researchers to advocate for reforms that incorporate those scientific findings into the criminal justice system (e.g. Kassin, 2014, 2022; Kassin and Gudjonsson, 2004; Snook *et al.*, 2021).

However, like other scientific disciplines, psychology and law research is not immune from merchants of doubt; that is, individuals who wish to detract from the communication of

Received 26 September 2024
Revised 11 October 2024
Accepted 1 November 2024

Conflicts of interest: We have no conflicts of interest to disclose.

scientific facts. For instance, there is widespread promotion and use of dubious practices within law enforcement, often in collaboration with paid, self-claimed "experts" (e.g. accusatorial interrogation practices for interviewing suspects, the analysis of 911 calls to detect guilt; Kovatch *et al.*, 2023; Murphy, 2023). It is also not unusual to see legal professionals, such as judges, dismiss scientific data that contradicts common sense or defend psycho-legal myths that confirm their beliefs (c.f. misbeliefs by judges about demeanor evidence in *R. v. N. S., 2012 SCC 72*, 2012; Snook *et al.*, 2017). In corrections, punitive approaches that run counter to empirical evidence make a comeback every now and then under the "get tough" philosophy or tough-on-crime agendas (e.g. Shaw and Woodworth, 2013). It appears that many psychology and law issues that are generally accepted by scientists has encountered some form of denialism.

Whether driven by financial interests, prior beliefs or ideologies, science deniers use rhetorical arguments to create the illusion of debate and raise doubts about well-established scientific propositions (Diethelm and McKee, 2009; Lewandowsky *et al.*, 2022). One strategy that science deniers use to manufacture a debate is known as *false balance* (or "bothsidesism"). Historically, false balance is when the journalistic norm of balance is exploited so that both the consensus view (i.e. broadly supported by experts) *and* the contrarian view of an issue (i.e. an opposing view supported by a minority) are reported with equal focus (Dearing, 1995). For example, news articles about police interviewing tactics sometimes contain expert opinions (e.g. scientific consensus about how minimization and maximization tactics in the Reid Technique imply promises and threats) that are followed immediately by anecdotes or testimonials that challenge expert consensus (e.g. "the Reid Technique is a very a successful method of obtaining confessions," Brean, 2011), or even counterarguments from interrogation company executives that have no basis in science [e.g. "False confessions are not caused by the application of (the Reid) principles, they are caused when investigators "step out of bounds" and engage in behavior that is inappropriate"; Gillis, 2016].

While balanced news coverage may, on the surface, appear to be just a harmless journalistic practice, spokespersons for corporations sometimes write correspondence that aims to diminish the credibility of psychology and law research. For example, a recent *New York Times* opinion piece from psychologist Saul Kassin about the risks of false evidence ploys on false confessions (Kassin, 2021) was paired with a response by John E. Reid and Associates (i.e. the "Reid technique" interrogation company). Because such correspondence is framed as an equal counterpart to scientific findings, people who seeks relevant information about an issue (e.g. via an internet search) would be readily exposed to two parallel worlds that are presented as equal in their legitimacy.

In other situations, the sheer frequency and disproportionate exposure to misinformation about legal issues raise doubt about the validity of the inferences made from scientific findings. For instance, although a report by the National Academy of Science – a nongovernmental institution to advise citizens of the USA about issues related to science and technology – revealed there is little scientific basis for polygraph examinations (National Research Council of the National Academy of Sciences, 2003; Iacono and Ben-Shakhar, 2019), yet, the general public are led to believe that the debate about the validity of this technique is ongoing. Organizations like American Polygraph Association continue to distribute contrarian perspectives, conduct problematic meta-analyses and publish grey literature that aims to convince people that polygraph examinations are reliable and that the results allow examiners to make valid inferences about guilt and innocence (e.g. their own Polygraph; Iacono and Ben-Shakhar, 2019). Likewise, despite being debunked, the public continue to be told that the debate over the existence of repressed memories has yet to be "settled" (Otgaar *et al.*, 2022); often due to the endorsement of unconscious repressed memories in clinical settings, and "experts" publishing findings in peer-reviewed journals

that aim to undermine an a widely accepted body of research (Otgaar *et al.*, 2023). Such a balanced reality gives an appearance that an issue remains unresolved.

To be clear, much scientific knowledge is tentative (see Popper, 1959) and true scientific debate is imperative (Lewandowsky *et al.*, 2016). Science grows out of empirical-based skepticism, where knowledge is generated and updated from objective, peer-reviewed evidence rather than from ideologies or *a priori* knowledge (Whitley and Kite, 2012). Scientific consensus is achieved when converging lines of independent, empirical evidence all point to the same conclusion, therefore reflecting the best available knowledge generated by the scientific community on a given topic at a given time (Miller, 2013). While a consensus view is not infallible (all ideas are open to investigation and updating), opinions from a few contrarians should not matter unless they provide evidence of comparable weight that better explains the existing data (Miller, 2013). By contrast, science denialism gives ideologies priority over empirical evidence. Unlike true skeptics, science deniers seek evidence that only confirms their claims (i.e. confirmation bias; see Nickerson, 1998) and discredit scientific propositions that challenge their cherished beliefs, therefore resulting in a fake debate over generally accepted scientific conclusions (Diethelm and McKee, 2009; McKee and Diethelm, 2010). Balancing scientific consensus with unsubstantiated nonsense has the potential to sway the public into believing that experts disagree more about a particular topic than they do (Boykoff and Boykoff, 2004); thus, making it unclear which side of the "debate" the public should believe (Dunwoody, 2005). This, in turn, makes it even more challenging for scientists to fulfill their responsibility of informing the public about scientific facts.

Content analyses of media coverage of a range of consequential issues has shown that false balance has pervaded the public communication about those issues (Merkley, 2020), including climate change (e.g. Petersen *et al.*, 2019), vaccine safety (e.g. Thomas *et al.*, 2017), the response to the pandemic (e.g. Zenone *et al.*, 2022), abortion (e.g. Kendall *et al.*, 2023) and elections (e.g. Miro and Anderson, 2024). Members of the public often lack the time, knowledge and resources to directly assess the relevant empirical evidence on these issues. Instead, the public must rely on subject matter experts who have evaluated the evidence. Typically, the public do not interact directly with subject matter experts but learns about their opinions through the news media (e.g. Wilson, 1995). Unfortunately, it is common for media outlets to give anti-scientific claims the same amount of coverage as scientific findings (e.g. "Fair and Balanced" Fox News; Dearing, 1995; Merkley, 2020). For example, research has shown that climate change deniers were featured nearly as often as scientists in digital and print media articles from 30 mainstream sources (i.e. 2,482 articles for science deniers and 2,463 articles for climate scientists; Petersen *et al.*, 2019). Moreover, false balance can also be achieved as people interact, wittingly or unwittingly, with merchants of doubt who convey their contrarian views via their social media posts, comments, podcasts, videos or even fake accounts, algorithms and generative AIs.

Communication scientists have suggested that providing a balanced presentation of competing views – regardless of the level of agreement among experts – serves to fulfill the expectations for a democratic society; which is built on the principles of freedom of speech, protecting the voices of minorities and not being ideologically biased (Boykoff and Boykoff, 2004; Taylor and Condit, 1988). In fact, a recent survey found that 76% US adults indicated that journalists should always strive to give equal coverage to every side of an issue (Forman-Katz and Jurkowitz, 2022). Unfortunately, science deniers have used false balance as a strategy to exploit society's commitment to *Dissoi logoi* (i.e. two sides to every story) across a range of domains (e.g. journalism, health, law, politics and education). For instance, research has shown that climate change deniers have testified as frequently as mainstream climate scientists in US congressional hearings on global warming (Dunlap and McCright, 2010). While balance, especially on issues that have not reached consensus, is a

good, false balance can lead to facts and myths being presented as equally legitimate (Ceccarelli, 2011).

Effect of "false balance" on perceptions and beliefs

So, how do the public perceive what experts think about scientific topics when presented with "balanced" arguments? The extant literature found that exposure to falsely balanced messages has a negative influence on perceptions of expert consensus and their certainty about scientific facts (Corbett and Durfee, 2004; Dixon and Clarke, 2013; Dixon *et al.*, 2015; Kohl *et al.*, 2016; Kortenkamp and Basten, 2015). For instance, Dixon and Clarke (2013) found that people who read a falsely balanced news article about the link between vaccines and autism perceived more disagreement among the experts and expressed less certainty about whether vaccines cause autism; compared to those who only read a one-sided article affirming the scientific consensus that vaccines do not cause autism and those who read an unrelated control article. Dixon and colleagues (2015) further revealed that providing falsely balanced coverage about the link between vaccines and autism decreased the accuracy of perceptions about what scientists believe about that issue and the participant' beliefs about that issue. These findings were replicated with small to moderate effects in the well-known topic of anthropogenic global warming (Cook *et al.*, 2017; Imundo and Rapp, 2021), health risks of air pollution, water pollution and mosquito-borne illness (Kortenkamp and Basten, 2015), and the lesser-known topics of brain functioning of facial recognition (Kohl *et al.*, 2016). Moreover, the reductions of accuracy in the participant's beliefs about scientific facts were explained by the increase in perceived expert disagreement over the topic, suggesting that false balance coverage may imply the absence of scientific consensus over a target issue (Dixon and Clarke, 2013; Dixon *et al.*, 2015; Imundo and Rapp, 2021).

In testing the bounds of the false balance effect, Imundo and Rapp (2021) demonstrated that exposure to a balanced presentation of an issue, regardless of source expertise, can also distort perceptions of expert consensus. Even when a climate scientist was paired with a science denier who was an expert whose expertise was irrelevant (e.g. physics) or paired with a layperson with no scientific background (e.g. automotive plant manager), participants perceived there to be less scientific consensus on global warming after reading balanced interview transcripts about climate change (Imundo and Rapp, 2021). Such a finding suggests that people focus more on the fact that there are competing views than the legitimacy of the experts and their opinions. The effect of false balance on perceived scientific consensus likely lies not in source effects that make deniers persuasive (e.g. Chaiken and Maheswaran, 1994) but in use of a representative heuristic whereby people overestimate the level of disagreement due to a misperception of the distribution of expert opinions; that is, the weight of evidence on each side.

Given the potential harm of falsely balanced messages, some journalists have been advised to inform their audience about the weight of evidence on competing perspectives (Cook, 2022; Dunwoody, 2005). The weight-of-evidence (WOE) approach acknowledges both sides of an issue but also emphasizes the amount of expert support on each side (Dunwoody, 2005). Research has shown that presenting WOE information alongside a balanced message leads to more accurate assessments of scientific consensus than presenting a balanced message alone (Clarke *et al.*, 2015; Dixon *et al.*, 2015; Imundo and Rapp, 2021). Such a finding not only suggests that WOE information is a promising intervention but also that the distorting effect of false balance may arise from the inappropriate amount of weight placed on the contrarian view (Boudana, 2016; Dearing, 1995; Schmid *et al.*, 2020). In other words, false balance coverage may distort one's perceptions of the actual proportion of experts who agree and disagree about a topic (Koehler, 2016)

Few studies have explored whether presenting WOE information alongside falsely balanced messages shift people's perception about the proportion of experts who agree about a

scientific fact. Koehler (2016) found that presenting both WOE information and a balanced message resulted in less accurate assessments of expert consensus compared to presenting only the WOE information. In a 2 (balanced message: absent, present) x 2 (level of expert consensus: high, low) design, all participants were first shown a statement about an economic issue and were then shown survey data on the percentages of experts who agreed and disagreed with the statement (weight of evidence). Half of the participants were further presented with balanced comments from two opposing experts. The level of consensus among the experts were manipulated as either high (e.g. 93% of experts agreed with the issue) or low (e.g. 38% of experts agreed with the issue). The results revealed that presenting balanced comments from experts on both sides of an issue alongside the numerical data on how many experts supported each side of an issue, reduced perceptions about the level of expert consensus; this finding was especially pronounced when a high-consensus issue was used. In addition, while perceptions of consensus differed between high and low expert consensus issues, the difference in ratings of perceived expert consensus was less pronounced when balanced comments were presented with the data about the level of expert consensus, compared to when only the data were presented. In short, falsely balanced messages decrease perceived expert consensus even when the exact WOE information is available, suggesting that perceptions of the percentage of experts on each side of an issue may be swayed from the actual data by falsely balanced comments (Koehler, 2016; Borgida and Nisbett, 1977).

Contrary to Kohler's study, however, Corbett and Durfee (2004) found that exposure to balanced messages did not overshadow WOE information. The level of perceived scientists' certainty about human-caused global warming for participants who read about a wider body of research supporting climate change (WOE) were similar to those who read about the WOE on climate change a balanced presentation of both scientific findings and climate misinformation (Corbett and Durfee, 2004). Similarly, Clarke *et al.* (2015) only found a small difference in perceptions of expert consensus on the vaccine-autism "link" between participants who read about the weight of evidence refuting the link and participants who read both the WOE and falsely balanced "expert" arguments.

Although the findings have varied in some ways, there appears to be a small effect of balanced messages on reducing perceived expert consensus (Clarke *et al.*, 2015; Koehler, 2016). The available data suggests that people's perception of facts, which are based on actual data regarding expert opinions (e.g. surveys), can be altered somewhat by simply presenting a balanced view of an issue (i.e. having competing experts provide their opinions about an issue).

Current research

Despite the presence of the "false balance" strategy in the domain of psychology and law, no research has yet examined how false balance distorts the public's perception of scientific consensus on issues in this domain. In practice, scientific consensus provides a reliable standard for evaluating policy and "popular science" claims (Luke *et al.*, 2023). Distortions in the public arena arising from falsely balanced messages may negatively influence a range of practitioner decisions (e.g. boarder agents using nonverbal cues to detect deception) or even jury's perceptions about scientific issues (e.g. evaluating expert evidence, influencing personal beliefs about forensic practices). Moreover, expert consensus plays a significant role in determining the admissibility of expert testimony in certain jurisdictions, including the USA and Canada (e.g. *Daubert v. Merrell Dow Pharmaceuticals, 509 U.S. 579*, 1993; *Frye v. United States, 293 F. 1013*, 1923; *R. v. J.-L.J*, 2000).

The current study conceptually replicated Koehler's (2016) study, examining the impact of falsely balanced messages on the perceived scientific consensus of an issue related to investigative interviewing practices. Replications, while seen as a necessity in research, are

often held in low esteem and rarely published because they are seen to lack creativity and originality (see Martin, and Clarke, 2017; Ioannidis, 2012a). However, philosophers of science have long argued that replications are necessary because they help ensure that we can have confidence in findings (Koole and Lakens, 2012). Replications increase confidence that the original effect can be reproduced and that, if valid measures are used, the effect reflects some underlying reality (Crandall and Sherman, 2016; Ioannidis, 2012b; Schmidt, 2009). More broadly, a successful replication can be viewed as a proxy for reliability on a larger scale. It means that the researcher has been able to control the research context and reduce random error associated with the many aspects of conducting research beyond the measurement of variables of interest.

The goal of the current research was to examine the extent to which balanced presentation of an interrogation practice with expert opinions from both sides would skew the public's perception of scientific consensus on the practice and their support for expert testimony. In addition, given that the effect of false balance has typically been examined on well-known topics such as vaccines and climate change where people are more likely to have prior beliefs, the present research tested the generalizability of Koehler's findings (2016) as the topic of minimization tactics is less likely to be familiar to the public. Based on previous research, we hypothesized that perceptions of expert consensus on a high-consensus issue would decrease following exposure to a balanced message with the factual percentages of expert opinions on each side of the issue (i.e. weight of evidence), compared to when only exposed to the weight of evidence. Also, the difference between the false balance and control conditions was expected to be larger for the high-consensus issue compared to the low-consensus issue.

Method

Participants

A*n a priori* power analysis using G*Power indicated that 259 participants were required to detect a small effect ($d = 0.35$) with an alpha of 0.05 and 80% power for a 2×2 between-subjects design. The choice to detect a small effect was based on Koehler (2016). Participants ($N = 259$) were recruited from the general population in Canada through an online survey platform called Prolific. Prolific was created specifically for the scientific community (unlike other crowdsourcing platforms), providing similarly high-quality data to MTurk with even more naïve and diverse participants (Peer *et al*., 2017). It also allows for prescreening of participants and provides strict guidelines to both participants and researchers regarding compensation, rights and obligations (Palan and Schitter, 2018). Participants were prescreened to have English as their first language and compensated £3 ($5.13 Canadian) for their time (the study lasted around 10 min). Five participants failed the attention check, resulting in a final sample size of 254. See Table 1 for a breakdown of participants by demographic variables (i.e. gender, age, level of education, ethnicity and level of income).

Design and procedure

A 2 (balanced message: yes, no) $\times$ 2 (expert consensus: high, low) between-subject design was used. Participants were assigned randomly to one of the four conditions:

1. no balance/high consensus;
2. no balance/low consensus;
3. balance/high consensual; and
4. balance/low consensus.

Table 1 Breakdown of participants by demographic variables

Demographic variable	*%*
Gender	
Male	50.0
Female	48.4
Other	1.6
Age	
Below 20	0.8
20–29	33.9
30–39	37.0
40–49	13.8
50–59	9.8
60–69	3.1
70–79	1.6
Level of education	
Some high school	0.4
High school graduate	9.4
Some post secondary	8.3
Diplomatic/certificate	14.6
Bachelor's degree	50.4
Graduate degree	13.4
Professional degree	3.5
Ethnicity	
Asian	16.5
Black/African	4.3
Hispanic/Latino	0.4
Indigenous/Aboriginal	1.2
Middle Eastern	2.0
Pacific islander	0.4
White	71.3
Other	3.1
Prefer not to say	0.8
Level of income	
$0–$9,999	7.1
$10,000–$24,999	8.7
$25,000–$49,999	16.9
$50,000–$74,999	20.9
$75,000–$99,999	21.7
$100,000–$149,999	14.6
$150,000	4.7
Prefer not to answer	5.5

Source: Authors' own creation

Participants were instructed to read a statement that was selected from a survey of experts on the psychology of confessions about a police interrogation tactic (i.e. minimization) and the proportion of the experts who agreed and disagreed with the statement. The same statement was used across all conditions. Based on their condition, participants were told that there was a high level of expert consensus (91% agree vs 9% disagree) or a low level of expert consensus (62% agree vs 38% disagree) about the statement via a summary table. Participants in the two no balance conditions were only presented with the statement and the summary table of percentages of the experts who agreed and disagreed with it. Participants in the two balanced conditions were presented with a comment from two opposing experts (i.e. balanced messages); the order of expert comments was randomized. The main dependent variable was perceived expert consensus; the policy support regarding the use of minimization tactics and expert testimony about the tactics were also be examined.

Materials

The materials included an informed consent form, two versions of instructions of the study, a statement about minimization tactics, two different summary tables about the level of expert consensus about the tactic, a balanced message excerpt (two comments each of which from two opposing expert opinions), a questionnaire about the dependent measures, a demographic form and a debriefing form. All experimental materials are available at https://osf.io/pa56x/?view_only=395d1f1d93164e17a0ba457c76d2e29a.

Instruction

The following instruction provided basic information regarding summary table stimuli that was presented to the participants in the next section:

Please read this information carefully because you will be asked questions about it later. In this study, you will be asked to read some results from a survey of experts on the psychology of confessions. The experts either hold a PhD in psychology, criminal justice and other related empirical fields, having published on confessions in peer-reviewed journals, or have testified as an expert witness on confessions. The experts were invited worldwide by virtue of their research or courtroom experience. Specifically, the experts were provided with a statement regarding a confession issue and indicated whether they agreed with the statement or not. You will be told the percentage of experts who agreed or disagreed with the statement. You will then evaluate the extent to which the experts agree with each other about that confession issue.

Participants in the balanced message conditions were further instructed:

The experts in the survey also provided a brief comment explaining their beliefs. You will be shown an example of comments from one expert who agreed with the statement and one who disagreed with the statement.

Statement and summary table

A statement about minimization tactics was selected from an online survey conducted by Kassin *et al.* (2018), which examined the scientific consensus among 87 experts (either highly published or with courtroom experience) about 30 issues pertaining to confessions and police interrogations. The minimization issue was chosen because it is one of the tactics rejected by scientists but is still allowed to be used in interrogations. Specifically, the statement achieved a high level of expert consensus in the survey; 91% of the respondents agreed that "Minimization tactics that communicate sympathy and moral justification for a crime lead people to infer leniency upon confession" (Kassin *et al.*, 2018). The issue is also less known to the public as a large body of evidence has shown that laypeople are unaware of the coerciveness of minimization (e.g. Kaplan *et al.*, 2020). In addition, only 16% of the survey respondents perceived it as common sense, compared to other issues (e.g. juvenile confessions, micro expressions; Kassin *et al.*, 2018).

To improve the comprehension of the concept, we put the statement to layman's terms:

Minimization tactics: Statements that police interrogators use to express sympathy (e.g. "I'm sure you didn't mean for this to happen") and moral justification (e.g. "Anybody in your situation would have reacted the same way") can cause a suspect to confess because the statements make them think they will be treated leniently in the future (e.g. less severe punishment) if they confess.

Following that, participants were presented with a summary table about the percentages of experts who agreed and disagreed with the statement. Although the same statement of minimization was used across conditions to control variations, we manipulated the expert consensus it achieved as either high (91% agree vs 9% disagree) or low (62% agree vs

38% disagree). To improve ecological validity, the decision to manipulate high consensus as 91% agree vs 9% disagree was based on the original result from the Kassin *et al.* (2018) survey; we manipulated low consensus to be 62% agree vs 38% disagree.

Balanced message excerpt

Participants in the balanced message conditions were further presented with comments from two opposing experts. That is, the balanced message included one comment from an expert who agreed with the statement and one comment from an expert who disagreed with the statement. The comments were adapted from news interviews with forensic psychologists (e.g. Hamilton, 2017) and counterarguments to scientific claims (John E. Reid and Associates). To convey an equal representation visual, the expert comments from both sides were presented as a 6-line paragraph, with 94 words on the agreed side and 83 words on the disagreed side. The structure of the comments on both sides was similar to each other – including explanations of the tactic, its purpose and supporting evidence, while the content was opposite by the sides. As mentioned before, the order of expert comments was counterbalanced – the comment from an expert who agreed with the statement was presented either before or after the comment from an expert who disagreed with the statement. The order between the summary table and the balanced message excerpt was not manipulated. The two aforementioned decisions were made based on Koehler (2016), in which no effect of either order variable was found on the level of perceived expert consensus, but the order of the comments was shown to influence participants' policy support.

Measures

We created a ten-item questionnaire for this study. The first item served as an attention check, asking about the topic of the material participants read (whoever did not select minimization tactics were excluded from the sample). The tenth item also served as an attention check, asking participants to pick 2 from the choices (no one failed this check). Items 2–4 were about perceived expert consensus on the statement, all of which were adapted from previous literature (Dixon and Clarke, 2013; Koehler, 2016). Specifically, the second item measured the extent to which there was agreement among the surveyed experts about the issue, using a seven-point scale (1 = *very little*, 7 = *very much*). The third item asked participants to provide the likelihood of two randomly selected experts from the survey sharing the same opinion about the issue, on a slider scale from 0% to 100%. The fourth item asked about perceptions of consensus in the expert community: "Suppose 100 different confession experts, with similar qualifications, were surveyed about this same issue. How many of these experts do you think would agree that minimization can cause suspects to think they will be treated leniently if they confess?" The responses were made on a slider scale from 0 to 100. The Cronbach's α for the items regarding perception of expert consensus was 0.81.

We also measured policy support for expert testimony on minimization tactics. Participants were required to provide their ratings of agreement on a seven-point Likert-type scale (1 = *strongly disagree*, 7 = *strongly agree*) with the statement: "There is enough agreement among experts about minimization tactics to form the basis of expert testimony in court." They were also asked to give the ratings of agreement with the usefulness of expert testimony: "It is reasonable to believe that expert testimony about minimization tactics would help judges and juries make decisions about guilt and innocence." A definition of expert testimony was provided in the questionnaire.

Moreover, participants were asked to rate their level of agreement (1 = *strongly disagree*, 7 = *strongly agree*) with the following statements about the use of minimization tactics: "The police should be allowed to use minimization tactics during an interrogation," "Using minimization tactics should be considered police misconduct (i.e. improper behavior that

could lead to disciplinary/punishment action)" and "A confession (admission of guilt) given after an interrogator used minimization tactics should not be used as evidence of guilt in court." To calculate the internal consistency for the above items, support for minimization item ("The police should be allowed to use minimization tactics during an interrogation") was reverse scored. The Cronbach's α of the items regarding to the use of minimization tactics was 0.91.

Statistical analysis

A Bayesian approach was chosen to analyze our results. In contrast to the traditional null hypothesis statistic testing (i.e. NHST; a dichotomous decision to reject the null hypothesis), the Bayesian approach allowed us to estimate the magnitude of the difference among groups (i.e. balance and consensus conditions) and, most importantly, to assess (un)certainty about the estimated true difference (Gelman *et al.*, 2014). It uses evidence from the data collected in the study to update our prior beliefs about the range of possible differences between the balance and no balance conditions (e.g. Kruschke, 2013). The degree of belief about the true difference, after accounting for the collected data and our prior assumptions, is expressed in the posterior probability distribution (Etz and Vandekerckhove, 2018). Unlike NHST confidence intervals, Bayesian posterior intervals represent a range of parameter values most compatible with the data and are used to summarize the posterior probability mass instead of hypothesis testing (Gelman *et al.*, 2014; McElreath, 2020). In addition, we adopted Bayesian estimation rather than evaluating Bayes factors (i.e. model comparison) because the latter by itself provides no information regarding the magnitudes of a parameter and is very sensitive to selected priors. Although we provide means, standard deviations and Cohen's *d* effect sizes, we recognize that some readers may wish to view our analyses framed in a more familiar light, thus the results of the NHST analyses are also available at https://osf.io/pa56x/?view_only=395d1f1d93164e17a0ba457c76d2e29a, including data and R codes.

Software and model metrics

Bayesian parameter estimation was carried out using *R* (version 4.1.1; R Core Team, 2020) and the *brms* package (version 2.16.1; Bürkner, 2017). A series of linear models were fitted to predict the differences in perceptions of expert consensus, by three dependent measures (i.e. perceived expert consensus, likelihood of consensus among two experts randomly selected and perceived consensus among the science community) and a combined measure of the three using *z* scores. Differences in relevant policy support [i.e. use of minimization tactics, minimization as police misconduct, (in)admissibility of the confession elicited, support on expert testimony and perceived impact of expert testimony on verdict decisions] were also explored. Importantly, multiple comparisons among the conditions were conducted to explore how the presence of a balanced message interacts with different levels of expert consensus presented and to examine the effect of balanced presentation on whether reducing perceived expert consensus about a high-consensus issue.

The models used broad prior distributions to make our inferences as objective as possible. Priors for the mean of the referent condition and residual error were set by default in the brms package, which uses a Student-*t* distribution with 3 degrees of freedom to provide better model convergence while weakly informative (Bürkner, 2017). For the differences of perceptions on expert consensus among the conditions, we used weakly informative priors [i.e. perceived expert consensus $\sim$ normal (0,6), likelihood of consensus among two experts randomly selected $\sim$ normal (0,15), perceived consensus among the science community $\sim$ normal (0,20), combined measure $\sim$ (0,3)]. For the differences of policy supports, priors were set by default using uniform distributions – it seemed proper here to set prior probability distributions as flat and uninformative because no previous study has

explored the impact of false balance on support for minimization tactics and expert testimony about the tactics.

Estimated by Markov Chain Monte Carlo sampling, we fit our models using four separate chains with random starting points for each parameter and at least 6,000 iterations per chain (half of which were used as a warm-up period). This resulted in a minimum total post-warm-up sample of 12,000 iterations for each model. Model convergence metrics indicated that our models had converged (R-hat = 1.00) and the indices are reliable due to sufficient Effective Sample Size (ESS approximately 10,000 across all parameters; Kruschke, 2021). Because the exact posterior probability distributions were unknown, we chose the estimated mode and highest density intervals (HDI) to represent the probability distributions. The *tidybayes* package was used alongside *brms* to compute the posterior mode for each model (version 3.0.3; Kay, 2023; Kurz, 2023). Moreover, the mean difference was chosen as our parameter of interest. The decision was both intuitive and rational: the mean difference directly described the magnitude of the difference in perceptions of expert consensus and policy supports between the balance and no balance conditions; the posterior HDI helped us to determine if the difference exists with certainty.

Results

Table 2 contains the descriptives statistics for each combination of variables by dependent measures and Table 3 contains the associated effect sizes.

Perception of expert consensus

As can be seen in Table 3, the effect sizes for the effect of balanced presentation on perceptions of expert consensus (i.e. perceived expert consensus, likelihood of consensus among two experts randomly selected, perceived consensus among the science

Table 2 Means and standard deviations for dependent measures

Dependent measures	*High-consensus issue*		*Low-consensus issue*	
	No balance	*Balance*	*No balance*	*Balance*
Perceived expert consensus (1–7)	6.40 (0.95)	5.69 (1.56)	5.02 (0.70)	4.60 (1.14)
Likelihood of two experts surveyed sharing the same opinion (0–100)	85.37 (16.60)	81.85 (16.32)	55.48 (14.49)	55.05 (15.15)
Perceived consensus in the science community (0–100)	88.26 (7.40)	85.35 (11.70)	62.66 (6.99)	63.00 (10.29)
Sufficient consensus to use expert testimony on minimization tactics (1–7)	5.74 (0.94)	5.18 (1.25)	4.63 (1.28)	4.74 (1.19)
Helpfulness of expert testimony on minimization for verdict decisions (1–7)	5.34 (0.97)	5.21 (1.26)	5.09 (0.98)	4.83 (1.08)
Support for the use of minimization tactics (1–7, unreversed raw scores)	4.97 (1.61)	4.37 (2.00)	4.77 (1.77)	5.14 (1.42)
Minimization is police misconduct (1–7)	2.98 (1.39)	3.42 (1.83)	3.08 (1.65)	2.75 (1.34)
Confession elicited is inadmissible (1–7)	3.03 (1.60)	3.53 (1.85)	3.03 (1.71)	2.80 (1.47)

Source: Authors' own creation

Table 3 Effect sizes for group comparisons by dependent measures

Cohen's d	$d_{Balance\_HC-HC}$	$d_{Balance\_LC-LC}$	$d_{Balance\_HC-balance\_LC}$	d_{HC-LC}
Perceived expert consensus (1–7)	−0.55	−0.44	0.80	1.65
Likelihood of two experts surveyed sharing the same opinion (0–100)	−0.21	−0.03	1.70	1.92
Perceived consensus in the science community (0–100)	−0.30	0.04	2.04	3.56
Sufficient consensus to use expert testimony on minimization tactics (1–7)	−0.51	0.09	0.36	0.99
Helpfulness of expert testimony on minimization for verdict decisions (1–7)	−0.12	−0.25	0.26	0.32
Support for the use of minimization tactics (1–7, not reverse-scored)	−0.33	0.23	−0.44	0.12
Minimization is police misconduct (1–7)	0.27	−0.22	0.42	−0.05
Confession elicited is inadmissible (1–7)	0.29	−0.14	0.44	0

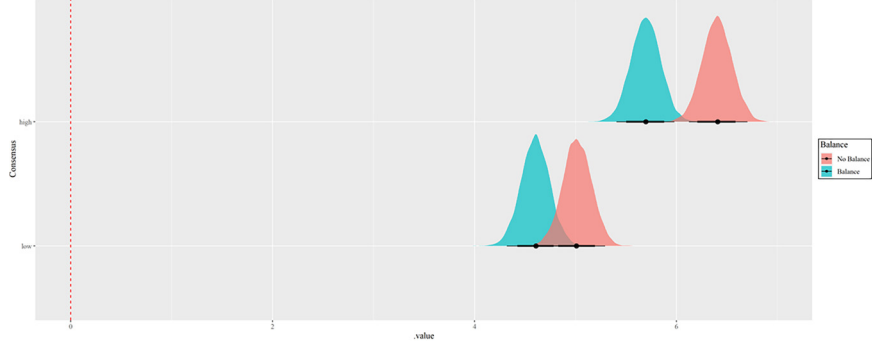
Source: Authors' own creation

community) ranged from 0.03 to 0.55. Specifically, the presence of a balanced message decreased perceptions of expert consensus about minimization tactics, with small to medium effects for the high-consensus issue (i.e. *d*s = 0.55, 0.21, 0.30, respectively); the effects were small for the low-consensus issue. The size of the difference in perceptions of consensus between high and low consensus conditions were large; despite the finding that the effect sizes of the differences in the balance conditions were smaller (*d*s = 0.80–2.04) than those in the no balance conditions (*d*s = 1.65–3.56).

Posterior probability distributions. For the direct measure of perceived expert consensus (seven-point scale, 1 = *very little*, 7 = *very much*), the posterior probability distributions of each condition are shown in Figure 1. The posterior probability distribution of the mean differences among the conditions is shown in Figure 5. As shown, the posterior probability mass of the difference between balance and no balance conditions on a high-consensus issue moved away from zero (95% *HDI* [−1.14, −0.32], *posterior Mode* = −0.68). In other words, we are quite certain that the presence of a balanced message would decrease perceived expert consensus when the consensus on the issue is high. We are also certain that a balanced message would decrease perceived expert consensus on a low-consensus issue, but the posterior probability mass was close to zero (95% *HDI* [−0.79, −0.02], *Mode* = −0.43). While perceptions of consensus were different when expert consensus was high or low, the most probable differences between the two baseline conditions when no balance message was present (95% *HDI* [1.00, 1.80], *Mode* = 1.37) were larger than or equal to the most probable differences than when a balanced message was present (95% *HDI* [0.68, 1.49], *Mode* = 1.09). In sum, these findings suggest that the presence of balanced conflicting comments from an expert on either side of an issue might reduce perceived expert consensus, and this effect would be more pronounced when actual expert consensus on an issue was high (compared to low).

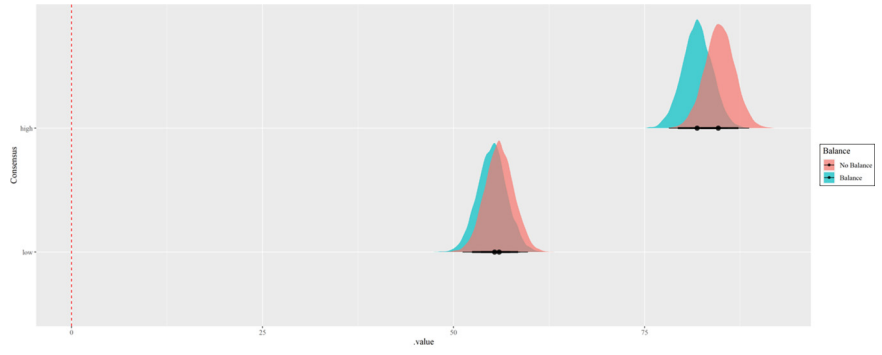
When asked about the likelihood of two experts who were selected randomly from the survey sharing the same opinion (0%–100%), the posterior probability distributions of each condition are shown in Figure 2. The posterior probability distribution of the mean differences among the conditions is shown in Figure 6. As indicated, we are around 80% certain that the presence of a balanced message would decrease the likelihood that the two experts would be seen to agree on a high-consensus issue (80% *HDI* [−6.31, 0.78], *Mode* = −3.15). However, we are uncertain about whether balanced presentation influences the likelihood that the two experts would be seen as agreeing on a low-consensus issue; that is, the

Figure 1 The posterior probability distributions of each condition for perceived expert consensus



Source: Authors' own creation

Figure 2 The posterior probability distributions of each condition for likelihood of two experts surveyed sharing the same opinions



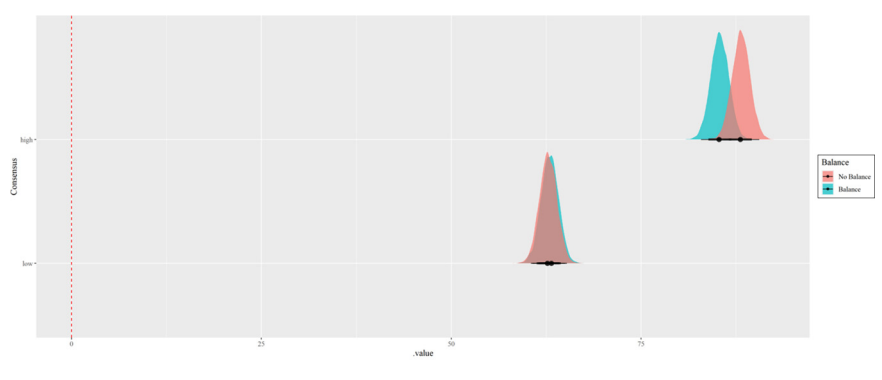
Source: Authors' own creation

posterior probability of the difference between balance and no balance conditions had zero in the middle (95% *HDI* [−6.07, 4.34], 80% *HDI* [−4.29, 2.55], *Mode* = −1.00).

As for the perceived consensus in the science community (0–100), the posterior probability distributions of each condition are shown in Figure 3. The posterior probability distribution of the mean differences among the conditions are shown in Figure 7. Akin to the likelihood of two experts agreeing with each other, we are at least 80% certain that exposure to a balanced message would reduce the perceived consensus in the science community when there is high-consensus issue (80% *HDI* [−4.93, −0.67], *Mode* = −2.82). We are uncertain if such reduction would happen for a low-consensus issue (95% *HDI* [−3.02, 3.37], *Mode* = −0.02).

An aggregate test on the overall change of perceptions of expert consensus was also conducted. As the above three key measures were conceptually consistent as well as internally ($\alpha = 0.81$), we combined the measures by first standardizing them via *z* scores and then taking the mean of the standard scores. The posterior probability distributions for the combined standard scores of perceptions on expert consensus by each condition are shown in Figure 4. The posterior probability distribution of the mean differences among the conditions are shown in Figure 8. As shown, we are quite certain that the presence of a

Figure 3 The posterior probability distributions of each condition for perceived consensus in the science community



Source: Authors' own creation

Figure 4 The posterior probability distributions of each condition for the combined standard score of perceptions of expert consensus

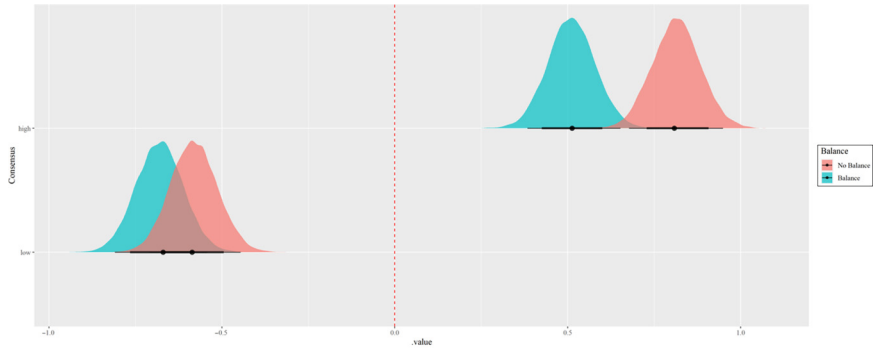


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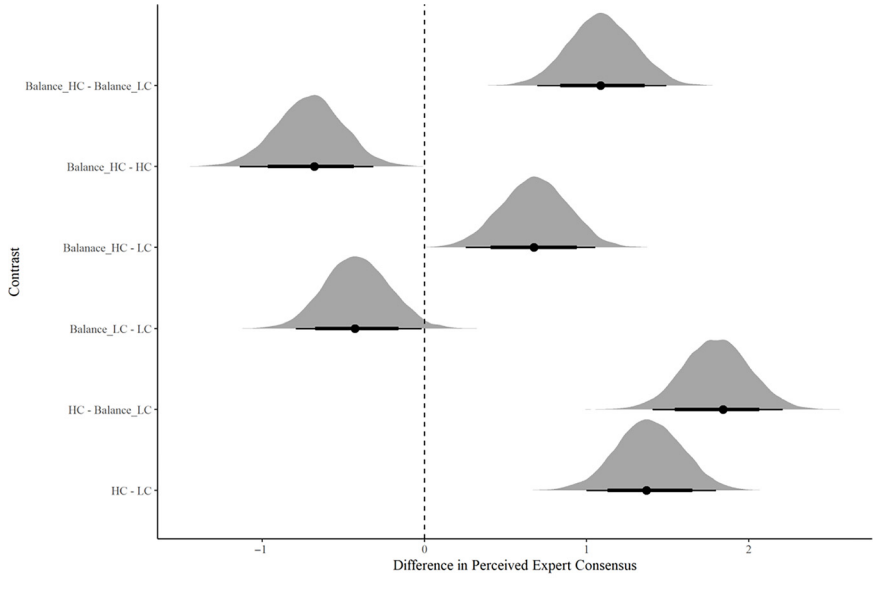
Figure 5 The posterior probability distribution of the mean differences among the conditions for perceived expert consensus



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balanced message would decrease perceived expert consensus on a high-consensus issue (95% *HDI* [−0.50, −0.11], *Mode* = −0.30), but we are less certain about the effect of balanced presentation on a low-consensus issue (95% *HDI* [−0.28, 0.10], *Mode* = −0.10).

Policy support

Consistent with perceptions of expert consensus, the presence of balanced message decreased the belief that there was enough expert consensus to back the use of expert testimony in court and there was a medium effect on the high-consensus issue ($d = 0.51$).

Figure 6 The posterior probability distribution of the mean differences among the conditions for likelihood of two experts surveyed sharing the same opinions

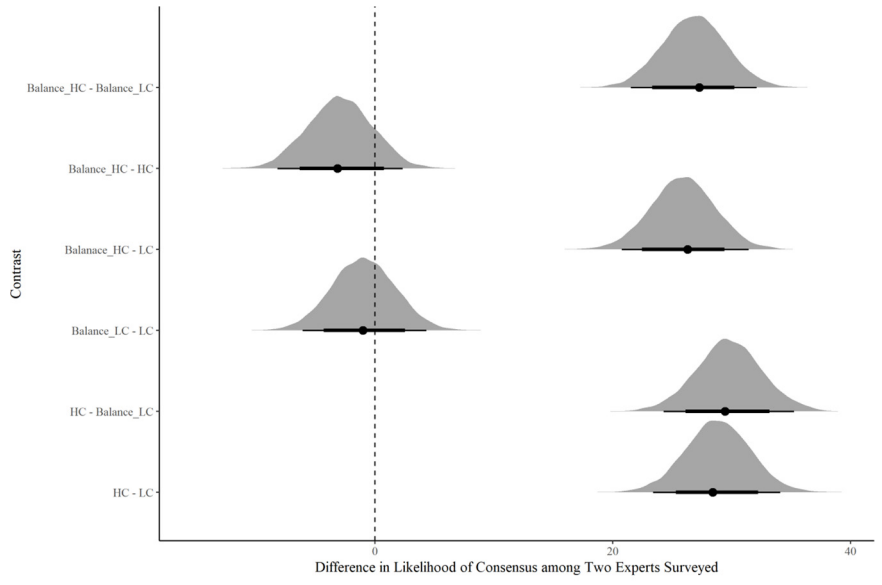

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Figure 7 The posterior probability distribution of the mean differences among the conditions for perceived consensus in the science community

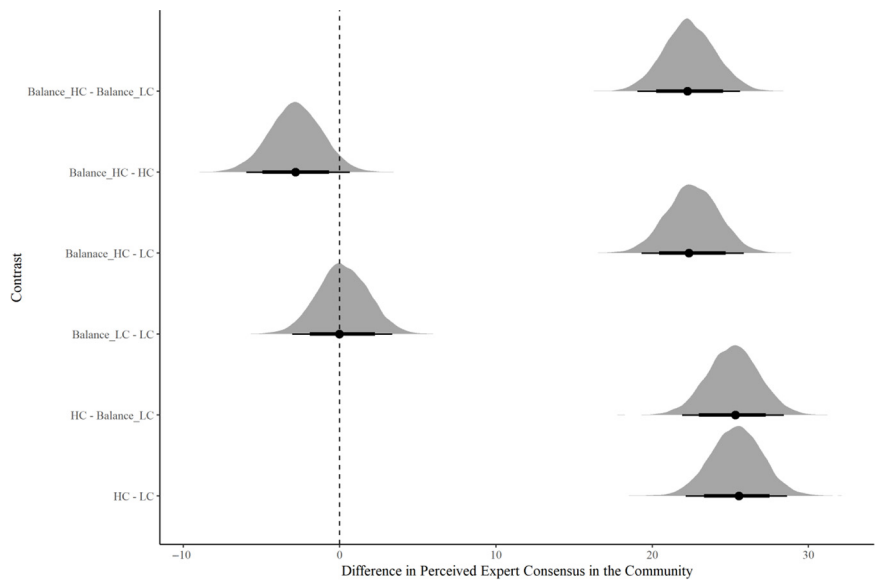

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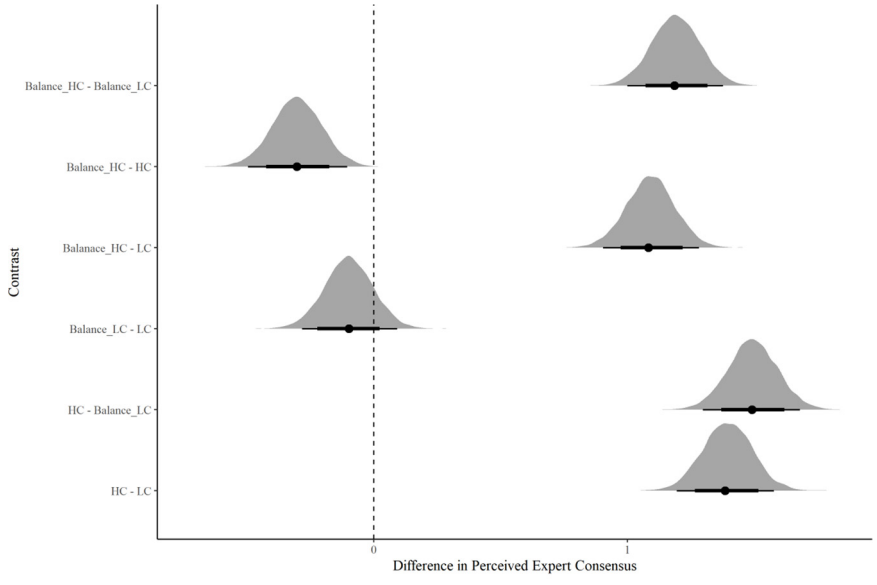
Figure 8 The posterior probability distribution of the mean differences among the conditions for the combined standard score of perceptions of expert consensus



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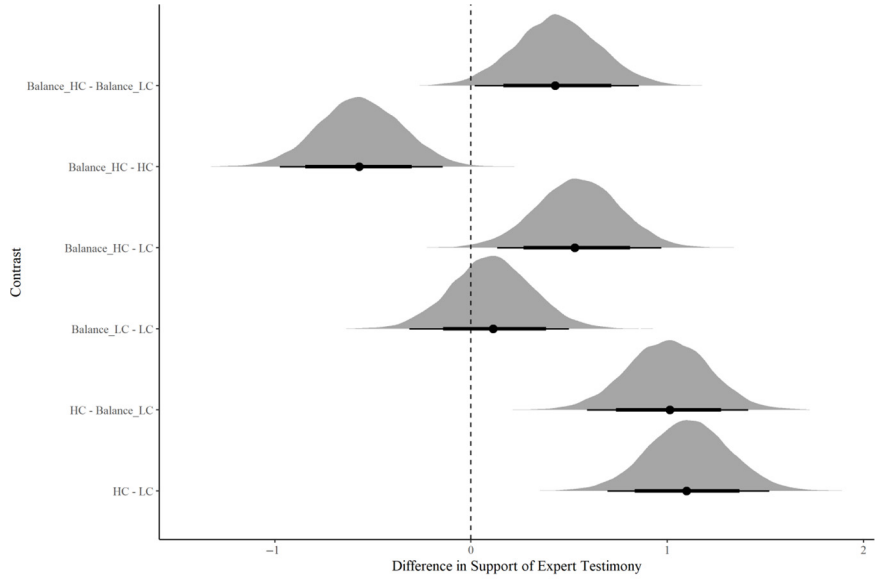
Balanced message exposure also decreased beliefs that expert testimony would be helpful with making verdict decisions, however, the effects were small (*d*s = 0.12 and 0.25).

We also found that the use of minimization tactics was generally endorsed and the implementation of a policy to ban the tactic was rejected. As indicated in Table 2, participants across all conditions supported the use of minimization tactics, did not perceive it as a form of police misconduct and did not think that a confession elicited by minimization should be inadmissible; these findings emerged regardless of the level of expert consensus on the issue (i.e. the effect sizes of the differences between high and low consensus were negligible). Nonetheless, the presence of a balanced message seemed to make participants less likely to support minimization tactics, more likely to consider minimization as police misconduct and more likely to think the confession was inadmissible when they were told the issue achieved high consensus among experts (i.e. small effects, *d*s = 0.29–0.33). Conversely, participants in the balance conditions were more likely to support minimization and less likely to consider it as police misconduct or that the confession should be inadmissible when the issue was seen to have low consensus amongst experts (i.e. small effects, *d*s = 0.14–0.23).

Posterior probability distributions. As for the support for expert testimony on minimization tactics based on expert consensus, the posterior probability distributions of the mean differences among the conditions are shown in Figure 9. Given the data, we are quite certain that a balanced presentation would decrease the belief that there is enough expert consensus to support expert testimony on a high-consensus issue (95% *HDI* [−0.97, −0.14], *Mode* = −0.57). But there was uncertainty about whether a balanced message reduced the belief in expert testimony on a low-consensus issue; zero was around the center of the posterior probability mass (95% *HDI* [−0.31, 0.50], *Mode* = 0.11). In addition, the most probable differences between the two baseline conditions when no balance was present (95% *HDI* [0.70, 1.52], *Mode* = 1.10) were larger than or equal to the most probable differences when a balanced message was present (95% *HDI* [0.02, 0.86], *Mode* = 0.43).

Figure 9 The posterior probability distribution of the mean differences among the conditions for support for expert testimony on minimization tactics based on expert consensus



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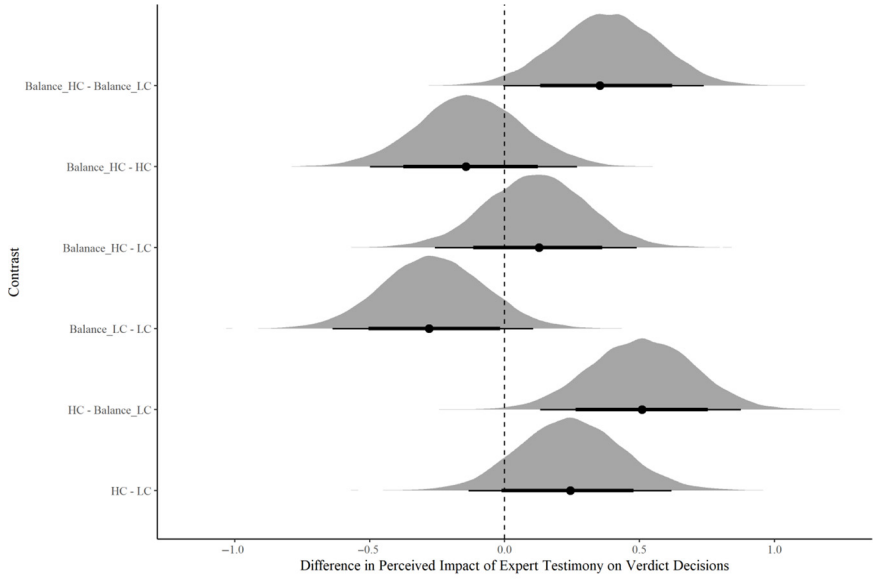
In line with perceptions of expert consensus, these findings suggest that the presence of a balanced message negatively affects consensus-related beliefs, namely, decreasing policy support for expert testimony on a high-consensus issue.

For the perceived impact of expert testimony about minimization on verdict decisions, Figure 10 shows the posterior probability distributions of the mean differences among the conditions. We are 80% sure that a balanced presentation would decrease the belief that expert testimony about minimization tactics would help judges and juries make verdict decisions on a low-consensus issue (80% *HDI* [−0.50, −0.02], *Mode* = −0.28). Nonetheless, there was more uncertainty that a balanced message would reduce the belief on a high-consensus issue (95% *HDI* [−0.50, 0.27], 80% *HDI* [−0.38, 0.12], *Mode* = −0.14).

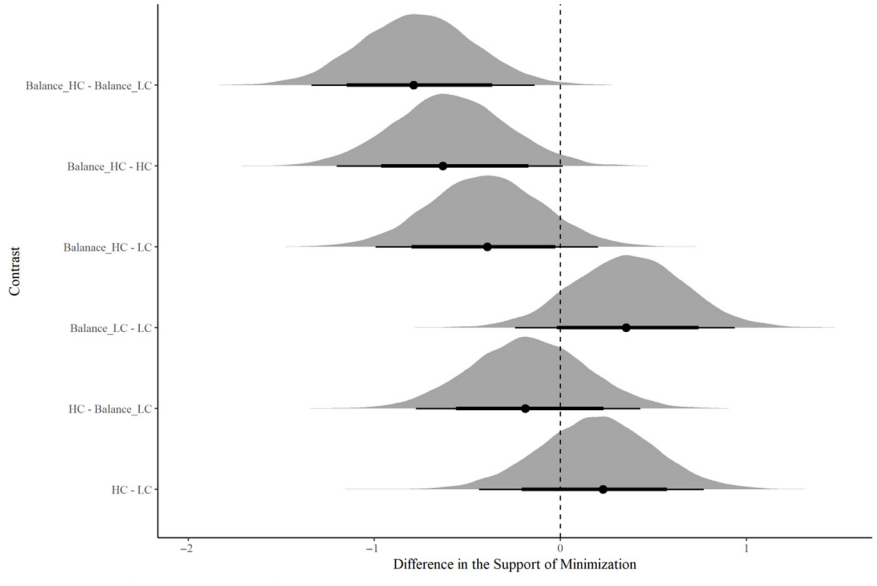
For personal beliefs about the usefulness of minimization tactics (i.e. support for the use of minimization tactics, minimization as police misconduct, confessions elicited as inadmissible), the posterior probability distributions of the mean differences among the conditions are shown in Figures 11–13. As can be seen, the posterior probability masses of the differences in those beliefs between the high-consensus and low-consensus conditions contained zero in the central area, suggesting that there is some uncertainty about whether the level of expert consensus influenced personal beliefs about the admissibility of minimization tactics. Nevertheless, a balanced presentation seems to move people's beliefs further toward the direction aligning with the level of expert consensus provided. Given the data, there was at least 80% certainty that when a balanced message was presented with a high level of expert consensus, people would show less support for the use of minimization (80% *HDI* [−0.96, −0.17], *Mode* = −0.63), consider it more as police misconduct (80% *HDI* [0.07, 0.80], *Mode* = 0.48) and be more likely to think the confession inadmissible (80% *HDI* [0.11, 0.88], *Mode* = 0.53). Conversely, when a balanced message was presented with a low level of expert consensus, people might show more support for minimization (80% *HDI*

Figure 10 The posterior probability distribution of the mean differences among the conditions for perceived impact of expert testimony about minimization tactics on verdict decisions



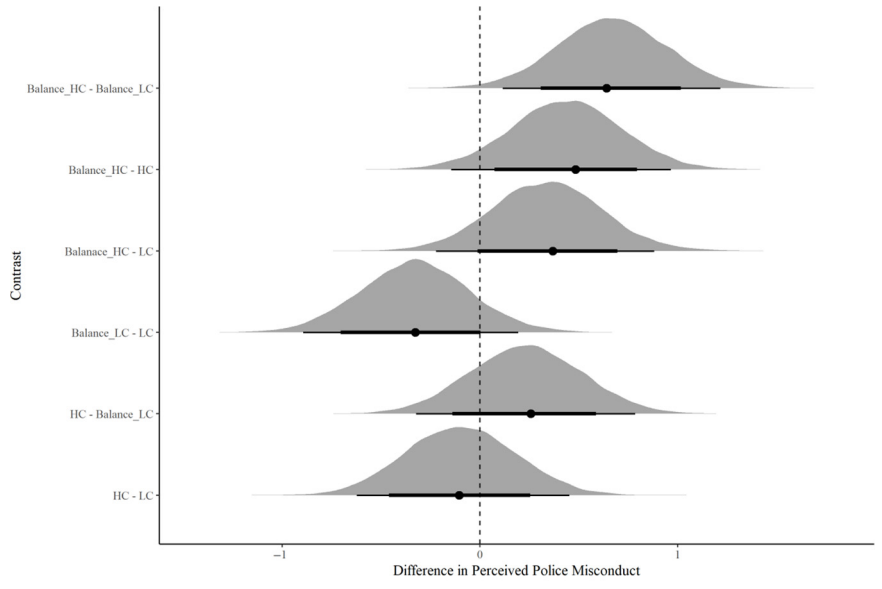
Source: Authors' own creation

Figure 11 The posterior probability distribution of the mean differences among the conditions for support for the use of minimization tactics



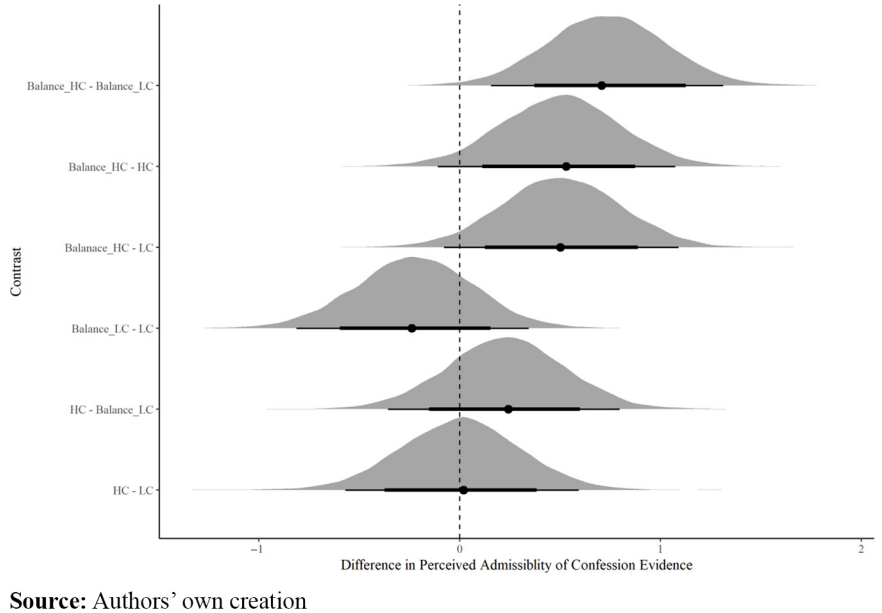
Source: Authors' own creation

Figure 12 The posterior probability distribution of the mean differences among the conditions for the belief that minimization is police misconduct



Source: Authors' own creation

Figure 13 The posterior probability distribution of the mean differences among the conditions for the belief in the admissibility of the confession elicited by minimization tactics



Source: Authors' own creation

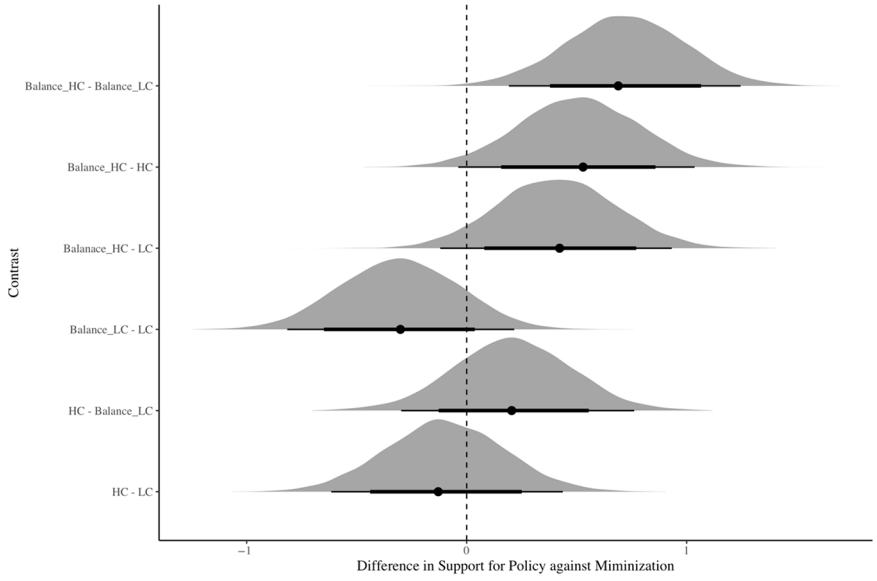
[−0.02, 0.74], *Mode* = 0.35) and be less likely to consider it as misconduct (80% *HDI* [−0.70, 0.003], *Mode* = −0.33).

An aggregate test on the three combined policy support scores was also conducted given the items were consistent ($\alpha = 0.91$; note that the support for minimization item was reverse scored). As shown in Figure 14, the posterior probability masses of the differences in those beliefs between the high-consensus and low-consensus conditions contained zero in the middle. But we are quite certain that the presence of a balanced message would make people endorse minimization tactics less on a high-consensus issue (80% *HDI* [0.16, 0.86], *Mode* = 0.53), while we have less certainty that the balanced presentation of a low-consensus issue might increase the endorsement of the tactics (80% *HDI* [−0.65, 0.04], *Mode* = −0.30).

Discussion

Our findings suggest that exposure to a balanced message about minimization tactics (especially when expert consensus was high) decreases the level of perceived expert consensus about those tactics. Even though the reduction in perceived consensus was relatively small, evidence of the distortion caused by the falsely balanced message is consistent with prior research (Koehler, 2016), and our findings are meaningful because some people deviated from the data that were presented to them. In addition, the difference in perceptions of expert consensus between the high and low consensus issues revealed that people can perceive the true level of expert consensus. With that in mind, these findings suggest that exposure to balanced messages interfere with perceptions of facts, and that they may be weighting evidence on each side inappropriately, thus, leading people to underestimate how much expert agreement exists. The inappropriate weighting of evidence is also evident when considering participants' opinions about admitting confession expert testimony. As perceptions of expert consensus reduced, we found that

Figure 14 The posterior probability distribution of the mean differences among the conditions for the combined score of policy support against minimization tactics



Source: Authors' own creation

people became less supportive of wanting to hear experts testify about the likely effects of minimization tactics on confessions. This finding is particularly alarming since it aligns with a sentiment from some judges that expert testimony on interrogation practices and false confessions ought to be rejected because it does not go beyond "commonsense and human experience" (*R. v. Leslie*, 2008, para. 10; also see *R. v. Bonisteel*, 2008; *R. v. Garnier*, 2017; *R. v. Ledesma*, 2014; *R. v. Omar*, 2016; *R. v. Swampy*, 2015). Exposure to any form of false balance might worsen the situation by negatively impacting a judge's decision about the admissibility of expert testimony or decrease the perceived credibility of the testimony to jurors.

One potential psychological process underlying how falsely balanced messages impact perceived expert consensus is partition dependence (Koehler, 2016). It refers to a bias in probabilistic reasoning in which people assess the probabilities of events as if they correspond to the sections where the option sets are grouped (Fox and Rottenstreich, 2003). In other words, people are likely assigning the probabilities of two different events as equal if the choice sets of the events are simply partitioned as two categories (Fox and Clemen, 2005; Fox and Rottenstreich, 2003). Falsely balanced message may invoke a 50 / 50 partition (there are two sides of a debate) which biases judgments toward a midpoint (Koehler, 2016). A balanced presentation of two disagreeing expert comments may work as a representative heuristic for sample proportions. The numerical weight-of-evidence information may be insufficient for the adjustment of the weight to one of the two sides, causing the process of updating beliefs to be excessively influenced by the representativeness-related features of the balanced presentation (Griffin and Tversky, 1992). Moreover, people tend to neglect the base rates and draw inferences based on sample proportions (Kahneman and Tversky, 1972). Future research could examine this account by comparing balanced messages with expert comments in equal proportion on each side to two-sided messages with expert comments in proportion to their relative prevalence among the expert population (e.g. 3:3 comments for 50% agree vs 50% disagree, 6:1 comment for 84% agree vs 16% disagree).

The current study did not provide a certain answer about whether a balanced presentation would decrease the sharpness of the difference in perceived consensus between high and low consensus issues, which was inconsistent with Koehler's study (2016). As indicated, there were overlaps among the posterior probability masses of differences between the balanced and no balanced conditions, suggesting some uncertainty about whether balanced messaging interacts with level of expert consensus. Thus, it is possible that instead of the partition dependence explanation, the mere perception of a conflict works as a heuristic that guides estimations of the level of expert consensus (Koehler, 2016; Tversky and Kahneman, 1973). Moreover, previous research has only revealed an ordinal interaction with small effect sizes using a larger sample than the current study ($n = 399$; Koehler, 2016). These sorts of interactions in the frequentist NHST approach require large sample sizes to detect significance and achieve high power (Lakens, 2022). Granted that the current study has a comparatively smaller sample (i.e. 254 participants), future replications are needed with a larger sample size. While the Bayesian approach is valid for any sample size, different sample sizes will yield different levels of certainty of the estimation (Kruschke, 2015). When there is a larger sample, the width of the posterior probability mass is simply narrower and herein more certain about the probable parameters (McElreath, 2020).

When it comes to the policy support variables, we did not find a difference between participants who only read a high and low level of expert consensus. In addition, we found that minimization tactics were generally supported and not viewed as misconduct, and that a confession elicited using a minimization tactic was believed to be admissible across all groups. These results suggest that people do not care what experts think of minimization tactics when it comes to their own judgments about policies. More importantly, the fact that

the minimization statement and comments used in the current study did not explicitly state whether the tactics should be banned, participants' approval of minimization may rely on their commonsense or prior beliefs in interrogation and confessions. This is consistent with previous findings that laypeople tend to view minimization as an acceptable and legitimate police interviewing tool (e.g. Fallon and Snook, 2020, 2021); that they do not to recognize the coerciveness of the tactics and the risks of false confession associated with psychological coercion (e.g., Blandon-Gitlin *et al.*, 2011; Kaplan *et al.*, 2020); that they would not discount confession evidence even if they perceive the tactics used to induce it as coercive (e.g. Kassin and Sukel, 1997).

We also found that (compared to no balance conditions) people who read a balanced message were more likely to disapprove of the minimization tactics when they were told that the tactics offering leniency in exchange of confessions achieved high consensus but were less likely to disapprove of it when there was low expert consensus on the issue. One possible explanation is rooted in Chaiken and Maheswaran (1994) finding that highly motivated participants who were presented with ambiguous messages (e.g. messages containing both supportive and opposing positions) tend to generate more positive thinking about the advocated perspective when the source credibility was high. Yet, participants generated more negative thinking when the source credibility was low. Their results indicate a biasing effect of heuristic processing over systematic processing. Similarly, false balance may influence attitudes because of biased systematic processing (i.e. people use situational cues about scientist agreement as a heuristic to form their own personal beliefs). The balancing form provides message ambiguity, thereby allowing people to process the message in a direction that is consistent with heuristic processes. As such, if a balanced message is presented with a cue of high consensus, it can be expected to exert more favorable thinking toward the consensus view and vice versa.

In general, our study extended previous literature about how balanced presentation of an issue would influence perceptions of expert consensus on the issue. In particular, the study also served as a preliminary exploration of the false balance effect in the field of investigative interviewing. False balance in this field could be a serious problem as researchers have been advancing the scientific principles of investigative interviewing and advocating empirical-based practices for years. The advancement of knowledge and practice in this field might be slowed down or reversed by false balance and other forms of denials. Our findings are also troubling when considering that the adversarial legal system may have two opposing sides (the defense vs the prosecution) who present their positions before a seemingly impartial judge or jury (Roesch *et al.*, 2013; Pizzi, 1997). Although experts are expected to be neutral witnesses and unbiased from the needs of the side (defense or prosecution) that retained them, an expert testimony might be rebutted by a lawyer, or an expert on the opposing side, which leaves an impression of heightened disagreement among experts on the target issue.

To better understand the matter of false balance, it is necessary to have future replication with larger sample sizes and with different interrogation or confession issues (e.g. false evidence ploy, deception detection). It is also important to examine its underlying mechanisms to ensure the validity of effective interventions. In addition, the present study used an issue that participants are less likely to have strong opinions about compared to more ideologically charged issues like climate change or vaccines. While we attempted to eliminate potential preexisting beliefs via a highly controlled experimental paradigm and random assignment, future studies could explore the amount of change on perceptions of expert consensus caused by falsely balanced messages via pretest–posttest paradigm (e.g. newspaper articles) or explore how false balance update such strong prior beliefs. Moreover, the issue statement and comments we used did not explicitly state that the minimization tactics were good or bad. Future studies could clarify that such tactics were

harmful and lead innocent people to falsely confess and examine if there is stronger effect of balanced presentation on perceptions of consensus and how that impact their policy support regarding the use of the tactics.

Conclusion

The current study reinforced past findings that falsely balanced messages can distort perceptions of expert consensus when people are fully aware of the actual level of expert consensus. Despite some limitations, these findings are meaningful and alarming – especially given today's political climate where misinformation is labeled as "alternative facts," and disinformation is promoted as "freedom of speech." Science communication can be particularly vulnerable to the negative effect of false balance on perceived expert consensus, given the adversarial legal system, the courts' dependence on common sense and the widespread misbeliefs and dubious police practices.

Researchers in the field of investigative interviewing have been advocating for empirical-based police interview tactics and pushing for reforms for decades (e.g. Kassin, 2014; Kassin and Gudjonsson, 2004; Gudjonsson, 2021). It is important to note that not every story has two sides. Falsely balanced information might hinder the progress being made by investigative interviewing research by dismantling perceptions of scientific consensus. Of course, all scientific knowledge is tentative as there is no status quo in science (Popper, 1959). However, impartiality does not guarantee the veracity of the claims (Dunwoody and Peters, 1992). Simply expressing a position that is devoid of empirical support for the sake of having "balance" may inhibit attempts to educate the public about scientific facts. More importantly, the need to "cover all aspects" should not overshadow the existence of indisputable scientific facts (Ecker *et al.*, 2024).

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