

PERSUASION IN THE ERA OF DISTRUST:  
THE INFLUENCE OF EVIDENCE TRANSPARENCY AND AI-ASSISTANCE

---

A Dissertation  
presented to  
the Faculty of the Graduate School  
at the University of Missouri-Columbia

---

In Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Philosophy

---

by  
GO-EUN KIM  
Dr. Benjamin R. Warner, Dissertation Supervisor

July 2025

The undersigned, appointed by the dean of the Graduate School, have examined the dissertation entitled

PERSUASION IN THE ERA OF DISTRUST: THE INFLUENCE OF EVIDENCE  
TRANSPARENCY AND AI-ASSISTANCE

presented by Go-Eun Kim,

a candidate for the degree of Doctor of Philosophy,

and hereby certify that, in their opinion, it is worthy of acceptance.

---

Professor Benjamin Warner

---

Professor Mitchell McKinney

---

Professor Brian Houston

---

Professor Julius Riles

---

Professor Kathleen Rose

## DEDICATION

This dissertation is dedicated to my parents, Hongyoon Kim and Inhee Shin. Through your steadfast love, unwavering faith, and daily sacrifices, I have come to know the depth of God's grace. This work is a small testament to the devotion you have poured into my life. With all that I am and all that I will become, I promise to carry forward the legacy of love and faith you have entrusted to me.

## ACKNOWLEDGEMENTS

I begin with a sincere acknowledgment. This dissertation is not the result of my efforts alone. It represents the collective support, guidance, and encouragement of many individuals who stood by me throughout this journey. Initially, I believed I needed to handle everything myself, but I now recognize that this accomplishment is truly shared. I am deeply grateful to everyone who contributed to my progress.

Foremost, I extend my heartfelt gratitude to my advisor Dr. Benjamin Warner. At the beginning of my doctoral studies, adapting to life in the Midwest as an Asian woman was overwhelming. Dr. Warner welcomed me with patience, steady support, and constant encouragement. His thoughtful feedback consistently provided me with the strength and confidence to persevere. I am especially thankful for his unwavering belief in me even during moments when I doubted myself.

My sincere appreciation also goes to my committee members, Dr. Mitchell McKinney, Dr. Brian Houston, Dr. Julius Riles, and Dr. Kathleen Rose. Your insightful guidance and consistent encouragement greatly strengthened this dissertation and profoundly enriched my academic growth. Your dedication and expertise have left an enduring impact on my scholarly journey.

To my former master's advisor, Dr. Young Min, I express profound thanks. You ignited my passion for research and inspired me to pursue a career in academia. Your mentorship laid the foundation for my scholarly path and your influence remains deeply respected and appreciated.

I warmly thank my friends and colleagues, Blessing, Jihye, Maddy, Amnee, Kelly, and the entire Mizzou Communication family for their support. Your presence transformed a challenging and lengthy process into an enjoyable and meaningful experience. A special acknowledgment goes to Blessing whose encouragement and our

countless writing sessions were instrumental in guiding me across the finish line. Your support went beyond mere assistance, and you helped carry me through.

To my family, I am profoundly grateful for your unconditional love, unwavering faith, and endless sacrifices. Umma and Appa, my sister Hyeoun, and my in-laws, your prayers and encouragement have sustained me throughout this journey. This achievement belongs to all of us. To my husband, JongIn Lim, throughout periods of self-doubt and uncertainty, you stood steadfastly by my side. Your quiet strength, patience, and unconditional love provided me with the courage and reassurance needed to reach this milestone. Your support has truly been my greatest gift.

Finally, I give thanks to God, whose grace has guided me throughout this journey. This dissertation is a reflection of His faithfulness, not my own ability. Earning this Ph.D. has been a profound experience of His goodness and transformative power. I am deeply grateful for the lessons learned and the growth experienced along the way. God has been my source of strength and security, and to Him be all the glory.

## TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	ii
LIST OF TABLES.....	v
LIST OF FIGURES .....	vi
ABSTRACT .....	vii
Chapter 1: Introduction.....	1
Chapter 2: Literature Review.....	6
<i>Consensus-based strategies and their limitations</i> .....	8
<i>Improving persuasion through argument quality</i> .....	10
<i>Introducing ‘evidence transparency’ as a novel dimension of argument quality</i> .....	17
<i>Operationalizing evidence transparency: testimonial vs. demonstrative evidence</i> .....	21
<i>Artificial Intelligence (AI) as an emerging context for persuasion</i> .....	26
<i>Mechanisms underlying persuasive effects: credibility and threats to freedom</i> .....	31
Chapter 3: Methods .....	36
<i>Pre-tests</i> .....	36
<i>Main study</i> .....	50
<i>Procedure and participants</i> .....	56
<i>Measures</i> .....	59
<i>Manipulation check</i> .....	62
Chapter 4: Results.....	68
Chapter 5: Discussions .....	81
<i>Findings and theoretical contributions</i> .....	81
<i>Limitations and future directions</i> .....	88
<i>Conclusion</i> .....	91
Appendix A: Stimuli.....	94
Appendix B: Measures .....	112
References.....	117
VITA.....	138

## LIST OF TABLES

Table	Page
1. Final Pre-Test Experimental Condition Assignment .....	44
2. Main Study Experimental Condition Assignment .....	57
3. Summary of Responses to Demonstrative Tally Questions .....	64
4. Summary of Responses to Testimonial Tally Questions .....	64
5. Effects of Evidence Type on Persuasion Outcomes .....	69
6. Effects of Author Attribution on Persuasive Outcomes .....	72
7. Summary of Results .....	79

## LIST OF FIGURES

Figure	Page
1. Results of Manipulation Checks by Evidence Type .....	66
2. Effect of Evidence Type on Message Acceptance Across Levels of Trust in Scientists .....	70
3. Effect of Author Attribution on Policy Support Across Levels of Machine Heuristic .....	74
4. Mediation Model of the Effects of Evidence Type (Demonstrative vs. Testimonial) .....	76
5. Mediation Model of the Effects of Author Attribution (AI vs. Human) .....	77

PERSUASION IN THE ERA OF DISTRUST: THE INFLUENCE OF EVIDENCE  
TRANSPARENCY AND AI-ASSISTANCE

Go-Eun Kim

Dr. Benjamin Warner, Dissertation Supervisor

ABSTRACT

This study had two primary objectives: (1) to identify effective persuasive message strategies that reduce audience resistance stemming from distrust and preexisting biases, and (2) to examine the persuasive influence of author attribution. A between-subjects experiment ( $N = 1,435$ ) employing a 2 (evidence type: demonstrative vs. testimonial)  $\times$  2 (author attribution: AI vs. human) plus a control condition design, evaluated persuasive effectiveness regarding climate change impacts in Miami. Drawing on the concept of evidence transparency, the research distinguishes demonstrative evidence, characterized by high transparency and detailed explanations of scientific processes, from testimonial evidence, characterized by lower transparency and reliance primarily on expert authority. Results indicated that demonstrative evidence significantly increased message acceptance compared to testimonial evidence, although it did not similarly enhance policy support. Author attribution (AI vs. human) alone showed no direct persuasive effects. However, mediation analyses revealed underlying mechanisms. Specifically, demonstrative evidence primarily enhanced persuasion by reducing perceptions of threat to freedom. Additionally, while author attribution had no direct impact, human-attributed articles indirectly improved persuasive outcomes by enhancing perceived message credibility. Overall, these findings highlight that demonstrative evidence, emphasizing transparent and detailed explanations of scientific methodology, is recommended as an effective strategy to improve persuasive outcomes, particularly among audiences characterized by distrust and skepticism.

## Chapter 1: Introduction

Communication has been integral in the development of society, shaping relationships and addressing fundamental societal needs. A central function of civic communication involves proposing new ideas and fostering healthy debate, integrating diverse perspectives to reach optimal outcomes. Persuasion, as a core component of these communicative exchanges, critically determines which ideas ultimately gain acceptance. Consequently, persuasion has captured the attention of scholars and politicians alike, spanning from ancient Greek rhetoric to contemporary society.

While advancements in communication have expanded opportunities for civic discourse, they have also introduced significant challenges. A particularly concerning contemporary trend is the public's rejection of objective, evidence-based information related to historical, legal, and scientific issues. For instance, some individuals in the Southern United States deny the historical reality that the Civil War was fundamentally fought over slavery, instead attributing its causes primarily to states' rights (Duggan, 2018). Similarly, a minority but notable group of Americans continues to doubt scientifically established facts, such as human activity being the primary driver behind rising global temperatures (Leiserowitz et al., 2020). Such examples indicate that general persuasive strategies may not always function effectively.

Persuasion often backfires, resulting in audiences strengthening their existing beliefs rather than updating them in the intended direction. This observation contrasts with traditional views in science communication, which suggest that rejection of scientific facts primarily stems from insufficient knowledge or limited exposure to accurate information (Bauer et al., 1994; Bauer et al., 2007).

Although pinpointing the exact cause of this resistance to factual information is complex, one significant factor is the role of identity-based predispositions in information processing. People often interpret new information in a manner consistent with their preexisting beliefs and group identities rather than objectively evaluating evidence (Kraft et al., 2015; Taber & Lodge, 2006). Thus, distrust toward specific sources, such as scientists or experts, can substantially reduce the persuasiveness of messages conveyed by those sources.

In response to this resistance, scholars have explored various strategies aimed at counteracting psychological biases rooted in predispositions. One prominent theoretical approach involves activating an accuracy goal, a cognitive motivation encouraging individuals to thoroughly evaluate information objectively to reach the most accurate conclusion (Bolsen et al., 2014; Taber & Lodge, 2006). Research shows that activating an accuracy goal effectively mitigates biases across diverse societal issues (Bayes & Druckman, 2021). However, because this approach is inherently cognitive and motivational, it provides limited guidance regarding specific message characteristics that constitute effective persuasion.

Another widely studied strategy emphasizes enhancing the quality or strength of persuasive arguments themselves. Guided by the Elaboration Likelihood Model (ELM), this research tradition suggests that strong arguments significantly improve persuasive effectiveness. However, argument quality within ELM remains broadly and subjectively defined as it relies heavily on audience perceptions rather than identifying concrete universally persuasive features (e.g., Petty & Cacioppo, 1986). Consequently, the precise

message characteristics that contribute to argument strength remain elusive, posing challenges for practical applications.

To address this gap, the present study aims to identify and propose a measurable and operationalizable message characteristic of a strong argument that effectively enhances persuasive impact. Building upon existing research on argument quality, this study introduces evidence transparency as a critical component of effective persuasion categorized into demonstrative and testimonial evidence. Demonstrative evidence highlights transparency in how conclusions and findings are generated, unlike testimonial evidence which relies mainly on trusting expert conclusions. By explicating the distinct characteristics of these two evidence types, this study advocates for demonstrative evidence as a means to achieve effective persuasion, particularly in contexts involving politically polarized topics, where biases and misconceptions stemming from preexisting attitudes and beliefs often impede message acceptance.

Furthermore, this study investigates the persuasive influence of AI-generated messages, an emerging area of interest within communication scholarship that has attracted significant academic attention (Dehnert & Mongeau, 2022; Hancock et al., 2020; Sundar, 2020; Sundar & Lee, 2022). AI technology, encompassing applications such as virtual assistants, content recommendation algorithms, and automated text generation, has become increasingly prevalent as a persuasive agent capable of shaping audience perceptions, attitudes, and behaviors (Huang & Wang, 2023). The rapid rise and widespread popularity of advanced AI chatbots, particularly ChatGPT, underscores the importance and timeliness of examining AI's potential role in communication and persuasion.

In light of these developments, this research examines how attributing information to AI influences the persuasive effectiveness of messages related to climate change. Using a survey experimental design, the study investigates whether attributing messages to AI enhances or, conversely, reduces their persuasiveness. Existing scholarly debates provide competing perspectives regarding the persuasive potential of AI-generated content. One perspective suggests AI-generated messages offer persuasive advantages by appearing neutral, objective, less biased by human preferences, and potentially more personalized (Salvi et al., 2024). Alternatively, other researchers argue that AI-generated messages may encounter inherent disadvantages arising from people's favoritism toward human-attributed content (Zhang & Gosline, 2023) or their general skepticism and aversion toward messages generated by AI. Moreover, some recent studies have found no significant difference in persuasiveness between AI- and human-attributed messages. In this sense, comparing the persuasive impact of these two message attributions and exploring underlying mechanisms can provide greater clarity regarding this emerging communication dynamic.

In summary, this study aims to develop effective communication strategies to counteract growing public skepticism toward factual and expert-provided information. The research addresses two primary questions. First, it examines how specific message characteristics, particularly demonstrative versus testimonial evidence, influence persuasive effectiveness by promoting transparency and reducing biases associated with preexisting beliefs. Second, the study investigates the persuasive impact of AI-authored information compared to human-authored messages to clarify whether attributing information to AI influences message acceptance. Given the increasing public familiarity

with generative AI and its growing role in shaping perceptions, understanding how AI attribution affects persuasiveness on polarized issues is both timely and critical.

## Chapter 2: Literature Review

### Persuasion in an era of distrust

The prevailing social climate is marked by pervasive distrust. Recent studies from the Pew Research Center (see Gottfried et al., 2020; Rainie & Perrin, 2019) have shown persistently low levels of public trust in institutions across various sectors, including government, elected officials, and the news media. While public trust in scientists serving the public interest has improved somewhat, skepticism regarding scientific integrity remains (Funk et al., 2019). Only a minority of Americans believe that scientists are transparent about conflicts of interest and take responsibility for their errors. Similarly, attitudes toward higher education institutions and professionals vary significantly, with Republicans, for example, holding notably negative views of colleges and professors (Fingerhut, 2017; Pew Research Center, 2017). Skepticism toward professors is even more disappointing because scientists in academia have put their effort into public engagement with the purpose of increasing public trust in scientific communities and helping the public to be well-informed about science (Rose et al., 2020).

The prevailing distrust toward experts and accredited institutions responsible for testing and verifying information significantly undermines the public's confidence in the information they generate. Consequently, this skepticism often leads to the outright rejection of such information. Furthermore, the issue of public distrust becomes more pronounced when considering an individual's political, racial, or religious inclinations. Individuals tend to assess information not through logical reasoning within a message but rather guided by their preexisting beliefs and attitudes (Kunda, 1990). When motivated to align their conclusions with their existing beliefs, people tend to reject contradictory evidence and arguments, particularly when they strongly adhere to opposing viewpoints.

For instance, during the apex of the COVID-19 pandemic, Americans' perceptions of vaccine safety (Grossman et al., 2020; Zhou et al., 2023) and physical distancing (Gollwitzer et al., 2020) were significantly influenced by their political affiliations. Similarly, religious beliefs have been observed to influence individuals' scientific understanding (Sherkat, 2011). Highly religious groups often express lower levels of agreement regarding humanity's contribution to climate change or even its existence (Alper, 2022). Individuals tend to reject objective and scientific facts based on what they perceive to be true, as these facts are associated with experts they do not trust and contradict their personal beliefs.

This inclination toward biased information processing occurs when individuals pursue a directional goal, which motivates them to reach specific conclusions in alignment with their existing beliefs (Kunda, 1990). For example, Democrats are more likely to accept messages endorsed by Democrats and view their party members more favorably, while Republicans exhibit a similar pattern (Bolsen et al., 2014; Donovan et al., 2020). Nevertheless, it remains possible to promote impartial information processing by activating the accuracy goal, which aims to reach accurate and unbiased conclusions devoid of preexisting beliefs (Taber et al., 2009; Taber & Lodge, 2006). However, within the highly polarized social and political landscape, directional goals often override the pursuit of accuracy in information processing.

Consequently, it is crucial to develop effective communication strategies capable of functioning broadly without interruption from one's predisposition or distrust toward experts. Science communication has been a pioneering field addressing this issue, as its primary goal is to enhance public understanding of science, focusing on how to

effectively communicate with the general public. For decades, researchers in science communication have explored various strategies to address this challenge.

#### Consensus-based strategies and their limitations

Within the realm of science communication, emphasizing scientific consensus is recognized as a widely employed approach to address this challenge (Dixon et al., 2023). According to the gateway belief model, informing individuals about scientific consensus can update their perception of scientific certainty, potentially leading to changes in attitudes and beliefs (van der Linden et al., 2019). This approach posits that consensus communication can address public controversies by framing an issue as highly certain. Studies on climate change consistently support the idea that informing the public about scientific consensus increases acceptance of the science (Ding et al., 2011; Lewandowsky, 2021; van der Linden et al., 2019). Similarly, the persuasive effect of consensus has been observed in relation to other topics, such as vaccination (S. L. van der Linden et al., 2015), COVID-19 policies (Kerr & van der Linden, 2022), and genetically modified food (Dixon, 2016).

Prior to the gateway belief model, the deficit model of science communication (Bauer et al., 2007) proposed a similar idea, suggesting that public skepticism or rejection of science arises primarily due to insufficient knowledge and understanding. Therefore, effectively providing adequate scientific information can help address knowledge gaps, thereby improving public acceptance of scientific facts. However, the scientific literacy approach hasn't always been successful because of individuals' ideological predispositions conditioned by the effects of scientific information (Nisbet, 2005; Nisbet & Goidel, 2007)

However, the effects of highlighting the consensus have been repeatedly refuted (Bolsen & Druckman, 2018; Chinn & Hart, 2023; Pasek, 2018) and even shown to sometimes backfire (Cook & Lewandowsky, 2016; Ma et al., 2019) since the consensus message can evoke psychological reactance to a given message. Reactance against the scientific consensus is substantially observed in those who hold strong beliefs on the issue or predispositions closely associated with the issue (Bolsen & Druckman, 2018; Chinn & Hart, 2023; Ma et al., 2019). For example, Ma and colleagues (2019) reported that climate change consensus messages among scientists increase psychological reactance among Republican and Independent climate change skeptics. That is, a consensus message alone did not possess sufficient persuasive strength to overcome an individual's preexisting convictions and deeply held beliefs tied to their identity, such as their religious affiliation and political partisanship.

Additionally, the current information landscape, characterized by widespread public distrust in experts, poses further doubt about the effectiveness of expert consensus messages. The persuasive power of consensus among experts assumes a foundation of public trust in experts and established institutions, which is often lacking. The underlying mechanism of consensus relies heavily on heuristics such as the trustworthiness of experts and the significance of consensus as evidence of correctness (van der Linden et al., 2019). Given this, consensus messaging may be impactful but cannot be considered a magic bullet that effectively targets the skeptics, the very group scientists aim to persuade. As discussed previously, in the current social and political climate, public trust in experts who validate evidence and persuasive arguments is often low. In these circumstances, relying solely on scientific consensus may not be effective. Therefore,

there is a need for additional persuasion strategies that address public biases and misconceptions effectively when communicating scientific facts to the public.

#### Improving persuasion through argument quality

To explore effective message features for persuading the general public on controversial and highly politicized issues, this study begins by delving into prior persuasion research, focusing on the concept of strong persuasion. Dual-process models, notably the Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1984, 1986) and the Heuristic-Systematic Model (Serena. Chen & Chaiken, 1999), have been extensively studied in persuasion research. These models examine how individuals are persuaded through two distinct cognitive routes: central and peripheral, or systematic and heuristic. According to ELM, the cognitive route individuals take hinges on the extent of cognitive elaboration. In the central route, audiences meticulously scrutinize the message's logic and carefully weigh its pros and cons, whereas in the peripheral route, they rely on ancillary factors such as the humor and appeal of the source (Petty & Cacioppo, 1981, 1986).

Considering these two cognitive routes of information processing, ELM studies have largely focused on constructing persuasive messages and evaluating their effectiveness, specifically examining which message elements most effectively influence perceptions, attitudes, and behaviors. One significant factor is argument quality. According to the ELM, the persuasiveness of a robust argument is significantly more potent when processed via the central route, as individuals can fully discern its quality (Petty & Cacioppo, 1979, 1984). This prediction has found substantial support, particularly within psychology and marketing studies.

However, communication studies have yielded inconsistent findings regarding ELM's predictions, often emphasizing main effects of argument quality without clearly demonstrating the expected interaction between argument quality and cognitive processing routes. A meta-analysis of the ELM (Carpenter, 2015) underscores this inconsistency by demonstrating that strong arguments tend to influence persuasion across both central and peripheral routes. This finding suggests that the original ELM prediction, proposing that argument quality predominantly affects persuasion via the central route, may be less definitive than previously believed. This finding implies that argument quality consistently influences persuasion across processing routes, challenging the original ELM assumption that its impact is primarily route-dependent, and suggesting a need for clearer definitions and operationalizations of argument quality in varying contexts.

Despite argument quality's central role within ELM, insufficient attention has been paid to clearly defining and operationalizing this construct, especially in contexts involving politically polarized or controversial issues. To address this critical gap, the primary objective of this study is to clearly establish a measurable criterion for argument quality capable of overcoming psychological biases prevalent in information processing, thereby reducing public misunderstandings and misconceptions about scientifically validated facts. By explicitly defining and operationalizing argument quality through evidence transparency, this research aims to contribute significantly to enhancing public communication by carefully considering contextual factors that influence message acceptance and offering a clear, empirically testable conceptual framework.

## Empirical approaches to defining argument quality

There are two approaches to understanding argument quality: empirical and normative approaches. First, the empirical approach, rooted in the foundations of ELM studies (Petty & Cacioppo, 1986), characterizes a strong argument as one deemed convincing by its recipient. ELM's early work offers the following elucidation of argument quality:

We define a “strong” message as one containing arguments such that when subjects are instructed to think about the message, the thoughts that they generate are predominantly favorable. A “weak” message is one that is also ostensibly in favor of the advocacy. However, the arguments in a weak message are such that when subjects are instructed to think about them, the thoughts that they generate are predominantly unfavorable. A message that elicits a roughly even mixture of favorable and unfavorable thoughts would be considered an ambiguous or “mixed” message. (Petty & Cacioppo, 1986, p. 32)

This definition underscores the subjective evaluation of a message by its receiver. In essence, ELM research employs an empirical understanding of argument quality, contending that strong arguments are those perceived as such by message receivers. Consequently, argument quality is generally regarded as a subjective and adaptable concept, rather than a uniform and definitive one. Thus, the precise attributes defining a strong argument vary depending on the audience’s interpretation and cognitive processing of the message.

Additionally, ELM posits that individuals can evaluate the validity of a claim only when they are motivated to engage in systematic information processing. According to

the original assumptions of ELM, argument quality's impact is less influential when messages are processed through peripheral routes, as peripheral processing relies primarily on heuristic cues rather than detailed evaluation of message content. However, Carpenter's (2015) meta-analysis challenges this view, suggesting that argument quality influences persuasion consistently, regardless of the processing route. ELM tends to underscore the cognitive aspect, the manner in which individuals process information, in persuasion rather than focusing explicitly on argument quality.

As a result, the operationalization and manipulation of argument quality have been largely overlooked, contributing to unclear and inconsistent empirical findings regarding its impact on message acceptance. Researchers including Petty and Cacioppo (1986) have acknowledged this lacuna, stating, "One of the least researched and least understood questions in the psychology of persuasion is: What makes an argument persuasive? [...] Unfortunately, this important and rare work is in its infancy." (p. 31).

While ELM studies have attempted to address this question, significant progress has proven elusive as their efforts still primarily revolve around the perceptions of message audiences. For example, after generating a multitude of arguments, including both seemingly compelling and dubious ones, they asked study participants to rate the quality of these arguments. Several qualities determining argument quality were summarized, including believability, desirability, comprehensibility, compressibility, and familiarity. They conceded, "Our goal is to develop strong and weak messages that are roughly equivalent in their novelty and in our subjects' ability to understand them" (Petty & Cacioppo, 1986, p. 33).

Beyond ELM studies, other research endeavors have explored argument quality but remained largely tethered to the empirical approach. For instance, Cho and Choi (2010) examined the concept of perceived message quality, defining as “the judgment of the effectiveness of the message in fulfilling its intended outcome in the intended audience” (p. 304). Perceived message effectiveness has been frequently integrated into the realm of health communication. Analogous to the concept of argument quality within ELM, perceived message effectiveness is essentially operationalized as a persuasive and compelling message (Kang et al., 2009; Yzer et al., 2011). Again, most of these studies rely heavily on the message receiver’s perceptions and cognitive processing to assess argument quality.

#### Normative approaches to defining argument quality

As previously discussed, the Elaboration Likelihood Model (ELM) has drawn criticism for its oversimplified and circular interpretation of argument quality (Druckman, 2022; O’Keefe & Jackson, 1995). Areni and Lutz (1988) aptly noted that Petty and Cacioppo’s manipulation of argument quality merely captured argument valence, or the audience’s evaluation of the desirability of the expected outcome, rather than argument strength. More recently, Druckman (2022) argued that defining a persuasive message as one perceived to be persuasive lacks theoretical depth and amounts to “an inadequate tautology” (p. 73). In a similar vein, O’Keefe (2003) vociferously criticized the ELM’s differentiation between strong and weak arguments, citing its lack of specificity and clarity. He remarked, “When argument quality is operationalized as the ELM has defined it, argument quality variations provide simply a

means of indirectly assessing the amount of elaboration that has occurred” (O’Keefe, 2016, p.164).

To address these shortcomings, a normative theoretical approach offers a more concrete definition of argument quality. Unlike the empirical approach, the normative approach establishes clear, independently motivated criteria for evaluating arguments. O’Keefe and Jackson (1995) refer to this as an “independently-motivated account of argument quality” (p.91). In a similar vein, Hoeken and colleagues (2020) clarify that theorists of the normative approach “propose criteria that an argument should meet to be considered strong” (p. 196).

Thus, this approach centers on providing an independently motivated elucidation of argument quality, with a clear articulation of the conceptual framework (O’Keefe & Jackson, 1995). Recognizing the enormity of articulating a comprehensive definition of a normatively strong argument, scholars have chosen to concentrate on specific normative standards that can be applied to assess arguments. These standards encompass factors like argumentation explicitness (O’Keefe, 1997) and the evidence-satisfying normative criteria (Hoeken & Hustinx, 2009; Hornikx & Best, 2011; Hornikx & Hoeken, 2007). For example, O’Keefe (1997, 1998) revealed that argument explicitness significantly impacts persuasiveness. Making a conclusion explicit and delineating the advocate’s standpoint with detailed descriptions enhances effectiveness. Furthermore, normatively robust evidence comprises statistical and expert evidence. Statistical evidence is favored for its ability to probabilistically support the occurrence of a desirable consequence stemming from advocated behavior compared to anecdotal evidence (Hoeken & Hustinx, 2009). Similarly, arguments by authority garner greater message acceptance, as they bring

credibility, reliability, and expertise in the realm of the claimed topic (Hornikx & Best, 2011; Schellens et al., 2017).

Another line of research pertaining to the normative evaluation of arguments focuses on informal logic criteria. Informal logic is defined as a “branch of logic whose task it is to develop non-formal standards, criteria, procedures for the analysis, interpretation, evaluation, critique, and construction of argumentation in everyday discourse” (Blair & Johnson, 2000, p. 94). In particular, O’Keefe and Jackson (1995) suggested that normative criteria of argument quality can be derived from informal logic because it unveils “underlying message production principles that reflect the procedural obligations associated with good argumentation.” Informal logic introduces three criteria for evaluating an argument: relevance, acceptability, and sufficiency (Blair, 2015). That is, a persuasive argument adheres to premises that are true (acceptability), pertinent to the conclusion (relevancy), and offer ample support for the claim (sufficiency).

Although communication scholars have acknowledged the value of defining argument quality through normative standards (O’Keefe, 2003), the field has yet to develop a comprehensive conceptual framework or practical guidelines capable of consistently producing persuasive arguments effective across diverse public audiences. This limitation is especially pronounced when attempting to persuade individuals who exhibit substantial skepticism toward expert authority and whose perceptions are strongly shaped by preexisting identities. Specifically, applying informal logic criteria to argument quality likely requires tailored strategies for distinct audience segments, due to variations in how different audiences interpret the concepts of acceptability, relevance, and sufficiency.

In summary, the normative approach endeavors to provide a more lucid and objective understanding of what constitutes a strong argument, yielding specific criteria that can be implemented and measured. However, given the prevailing public distrust of experts and the presence of biased information processing, the current recommendations may fall short of achieving the requisite level of persuasiveness. Therefore, this study aims to identify and test the objective criteria of a strong argument that can effectively work in the current information landscape as well.

Introducing ‘evidence transparency’ as a novel dimension of argument quality

Evidence, as defined by McCroskey (1969), encompasses “factual statements originating from a source other than the speaker, objects not created by the speaker, and opinions of persons other than the speaker that are offered in support of the speaker's claims” (p. 170). The persuasion research has, to date, accumulated a substantial body of knowledge concerning the role of evidence in persuasion. Notably, scholars have delved into various aspects of evidence, encompassing evidence-based persuasion, the types of evidence (e.g., narrative vs. statistical), the quantity of evidence, and indicators of information source.

One particularly prominent area of study within this field involves the comparison of the persuasiveness of statistical (numeric) evidence with narrative (anecdotal) evidence (Hoeken & Hustinx, 2009). Narrative evidence typically presents a story with causal sequences of events and characters, typically conveyed from a first- or third-person perspective (Kreuter et al., 2007). It is presented as a form of testimony, anecdote, or episode that incorporates storytelling elements. In contrast, non-narrative evidence relies

heavily on factual information presented with logic and reason, predominantly focusing on numerical and statistical information to convey a message (Zebregs et al., 2015).

However, findings regarding the effectiveness of evidence types are mixed. Some studies indicate that narrative evidence is generally more persuasive (e.g., De Wit et al., 2008), particularly in recent research focusing on health behavior promotion (Chen & Bell, 2021; Dragojevic et al., 2023). Conversely, other research favors statistical evidence to be more effective (e.g., Allen & Preiss, 1997). Zebregs and colleagues (2015) provided a nuanced perspective, showing that the effectiveness of narrative and statistical evidence differs based on the desired persuasive outcomes. Specifically, statistical evidence appears to be more effective for eliciting cognitive responses such as attitude and belief changes, whereas narrative evidence tends to exert a stronger influence on behavioral intentions.

While much research continues to focus on comparing the persuasive effects of narrative versus non-narrative evidence, this strict dichotomy might be overly theoretical. In practice, persuasive messages frequently combine narrative and statistical elements rather than relying solely on one type of evidence. Additionally, existing research on narrative evidence predominantly addresses health behavior contexts, particularly advocating well-established, relatively non-controversial behaviors such as reducing binge drinking (Kang & Lee, 2018) and undergoing mammography screening (Kreuter et al., 2010). This focus raises concerns regarding the generalizability of these findings to more controversial or complex persuasive scenarios.

Given these considerations, this study explores a relatively under-investigated aspect of persuasive evidence that may hold broad applications beyond the typical health-

related contexts: evidence transparency. Transparency, defined broadly as the disclosure and accessibility of relevant information, has been extensively examined across various fields, including marketing, politics, and organizational decision-making (see Bhaduri & Ha-Brookshire, 2017; Raphael & Karpowitz, 2013; Revers, 2014; Vorm & Combs, 2022).

Specifically, evidence transparency involves clearly communicating detailed information that clarifies how conclusions were derived, particularly regarding processes, methods, data, and analytical procedures, rather than merely presenting final conclusions. Previous transparency research primarily focuses on business or governmental decision-making contexts (e.g., Dubbink et al., 2008; Evans-Reeves et al., 2015; Revers, 2014). Across these studies, transparency consistently fosters positive outcomes aligned with the intentions of the message sender or information source (Bhaduri & Ha-Brookshire, 2017; de Fine Licht, 2014; Yan et al., 2012). For instance, within public administration, individuals provided with detailed rationales for the development and justification of new organizational rules evaluated final decisions as more legitimate compared to those only informed of the final decision (de Fine Licht, 2014). Similarly, transparency also positively influences public policy approval (Juhl & Hilpert, 2021).

Surprisingly, despite transparency's extensive examination across various disciplines, it remains largely underexplored within Communication scholarship. Journalism, a closely related field, has taken greater initiative in investigating transparency and its effects, often positioning transparency as a contemporary counterpart to traditional journalistic objectivity. For instance, Curry and Stroud (2021) have found that journalistic transparency increased credibility assessments and engagement

intentions among news consumers. Similarly, Chadha and Koliska (2015) have demonstrated that transparency in newsrooms fosters audience trust by making the journalistic process more visible. Additionally, Peifer and Meisinger (2021) have also found that a disclosure feature explaining why and how a story was reported significantly improved message credibility. Together, these studies illustrate transparency's beneficial role in fostering trust, credibility, and perceptions of legitimacy. Collectively, these journalism-based studies underscore transparency's significant role in enhancing trust, credibility, and legitimacy perceptions, highlighting findings that are highly relevant to Communication research more broadly.

Applying insights from transparency literature to persuasion contexts suggests that transparency significantly enhances persuasive outcomes. Transparency involves more than simply increasing the amount of information provided; it emphasizes the provision of high-quality, detailed explanations about the reasoning processes, methodologies, procedures, and underlying data supporting conclusions. By clearly outlining how conclusions are derived, transparency facilitates greater audience comprehension and trust, ultimately enhancing message acceptance.

Informed by these insights, this study operationalizes evidence transparency by explicitly presenting detailed information about the methods, data, and analytical procedures used to reach conclusions. For example, climate change messages often highlight scientific consensus but omit explicit explanations of the research methods and evidence scientists employ to derive their conclusions. This lack of explanatory detail may hinder public understanding and diminish trust. Consequently, clearly outlining the detailed reasoning, including methodological steps, analytical procedures, and

foundational data underlying scientific claims through transparency, closely aligns with the concept of evidence transparency. This detailed and explicit presentation allows audiences to independently assess and understand scientific claims, significantly enhancing message credibility and persuasive effectiveness. This approach enables audiences to independently assess and understand the scientific claims presented, significantly enhancing message credibility and persuasive effectiveness.

#### Operationalizing evidence transparency: testimonial vs. demonstrative evidence

Building on the concept of evidence transparency introduced earlier, this study proposes and operationalizes a novel framework for understanding persuasive evidence by distinguishing between two key approaches: testimonial evidence and demonstrative evidence. This operationalization is foundational to this study, offering a theoretically grounded and practically applicable way to evaluate argument quality. The central claim is that how evidence is presented, not merely what evidence is presented, fundamentally shapes perceptions of transparency, which in turn influences audience understanding, trust, and message acceptance. The proposed distinction advances communication theory by situating evidence transparency as a core mechanism for persuasion, especially within contexts of public skepticism and politicized information environments.

Testimonial evidence refers to the presentation of conclusions and claims primarily through appeals to expert authority, institutional endorsement, or widely recognized scientific consensus. Testimonial evidence, frequently exemplified by consensus-based messaging, is widely utilized in persuasive contexts, particularly regarding scientific and health-related topics such as vaccination, climate change, and genetically modified foods (Bartoš et al., 2022; van der Linden et al., 2015; van

Stekelenburg et al., 2022). This form of evidence invites audiences to accept a message based on the perceived credibility and legitimacy of the source, rather than through direct engagement with underlying data or reasoning processes. In this sense, testimonial evidence assumes a relatively passive role for the audience, where trust in experts or institutions stands in as a proxy for epistemic evaluation.

This approach aligns with established science communication frameworks such as the deficit model and the gateway belief model. The deficit model suggests that public rejection of scientific information is due to a lack of knowledge, which can be corrected by providing credible expert conclusions (Bauer et al., 2007). Similarly, the gateway belief model holds that awareness of scientific consensus increases acceptance of scientific facts (van der Linden et al., 2019). Testimonial evidence operationalizes these models by emphasizing authoritative statements, endorsements by scientific institutions, and expert quotations as persuasive tools. For instance, statements such as “A professor at XX University argues that mask-wearing is an effective preventive measure against COVID-19, as their research demonstrates mask-wearing reduces virus transmission by n%,” “The director of the CDC provides assurance regarding the safety of the vaccine,” “The consensus among scientists is unequivocal that global warming is real and human-caused,” and “A comprehensive investigation conducted by the FBI conclusively refutes claims of voter fraud in the 2022 election.” exemplify testimonial evidence in action.

While this approach is commonly used and effective under certain conditions, it also has limitations. Specifically, testimonial evidence may fail to persuade audiences who harbor skepticism toward experts or institutions, or who perceive consensus messaging as an attempt to enforce conformity. In polarized contexts, reliance on

authority may inadvertently trigger psychological reactance, particularly among individuals whose identities or ideologies conflict with the perceived authority.

In contrast, demonstrative evidence refers to a mode of evidence presentation that provides audiences with direct access to the reasoning, data, and methodological processes underlying a claim, enabling them to follow how conclusions are reached. Rather than focusing solely on expert conclusions and findings, demonstrative evidence emphasizes the comprehensive and detailed contextual information that explains how those conclusions were derived through specific processes and methodologies. It is important to clarify that the term demonstrative evidence, as proposed in this study, differs from its conventional use in advertising and health communication research, where it often refers to product demonstrations or depictions of product use and consequences (e.g., Kang et al., 2009). Demonstrative evidence in this study does not refer to literal or visual demonstrations, whether scientific or behavioral. Instead, it emphasizes cognitive transparency through the explicit explanation of research methods, underlying data, and the reasoning that connects evidence to conclusions.

This usage reflects a normative commitment to procedural clarity, allowing audiences to trace how claims are derived rather than relying on visual or behavioral cues. Specifically, demonstrative evidence includes an extensive range of information regarding the foundational raw data upon which conclusions are based, the methods employed to collect and analyze these data, and the detailed procedural steps followed in conducting the research or investigation. Although demonstrative evidence may initially appear more intricate, indirect, or complex in delivering persuasive arguments, it

ultimately provides audiences with richer informational content, which may facilitate deeper comprehension and critical evaluation.

Whereas testimonial evidence emphasizes what experts assert and verify, demonstrative evidence provides a systematic account of the research process, including how conclusions are derived from data and analysis. This study identifies demonstrative evidence as the more transparent and cognitively engaging method for presenting persuasive messages. By explicitly guiding audiences through the specific steps, methodologies, and foundational data involved in the research, demonstrative evidence enables more independent and critical evaluation of claims, reducing reliance on source authority alone. As a result, this study proposes that demonstrative evidence is likely to produce stronger persuasive effects than testimonial evidence, leading to the following hypotheses:

H1: Exposure to persuasive messages (either demonstrative or testimonial evidence) will increase message acceptance compared to the non-persuasive (control) condition.

H2: Exposure to persuasive messages (either demonstrative or testimonial evidence) will increase policy support compared to the non-persuasive (control) condition.

H3: Demonstrative evidence will lead to greater message acceptance compared to testimonial evidence.

H4: Demonstrative evidence will lead to greater policy support compared to testimonial evidence.

Building on existing research demonstrating the persuasive advantages of demonstrative evidence over testimonial evidence, this study examines conditional factors that may influence the relationship between evidence type and persuasion effectiveness. Specifically, this study investigates the moderating role of trust in scientists, given that scientists serve as both creators and validators of scientific knowledge. People's preexisting trust in scientists significantly influences how persuasive messages about scientific topics are perceived and processed (Sonmez et al., 2023).

Trust is widely recognized as a critical factor in persuasion, as it strongly impacts acceptance of scientific facts and findings across diverse domains, including biotechnology (Preist, 2001; Siegrist, 2000) and nanotechnology (Lee et al., 2005). Particularly within the climate change context, trust has been found to decrease skepticism (Huber et al., 2022) and increase support for climate-related policy (Dietz et al., 2007). Conversely, a lack of trust substantially impedes persuasion, particularly concerning scientific topics. The challenge is illustrated by recent experiences during the COVID-19 pandemic, where individuals who had lower trust in scientists displayed heightened skepticism toward scientific recommendations and were less likely to adhere to public health guidelines (Muğaloğlu et al., 2022).

Such skepticism highlights a critical barrier in science communication. Those who hold strong doubts toward scientists, often characterized as a resistant and vocal minority, are precisely the group that persuasive science communication efforts typically aim to influence, given their urgent need for correction of misinformation and misconceptions. Generally, low trust toward scientists undermines persuasion because trust is closely tied to source credibility, scientists being the primary creators, validators,

and disseminators of scientific information and recommendations. Ironically, individuals with low trust in scientists represent a central target for persuasive science communication efforts, as correcting their misconceptions and misinformation is essential to achieving broader public understanding and acceptance of scientific facts.

Demonstrative evidence is likely better suited than testimonial evidence to address this dilemma effectively. Demonstrative evidence prioritizes methodological transparency, detailed explanations of data collection processes, and clear descriptions of analytical procedures. In doing so, it reduces reliance on explicit appeals to expert credibility and authority. Conversely, testimonial evidence, which prominently highlights expert consensus and authority, may unintentionally increase skepticism or provoke reactance among audiences already distrustful of scientific expertise. Demonstrative evidence, by clearly and transparently presenting scientific methods, allows skeptical individuals to independently evaluate information without feeling pressured by expert authority claims. Consequently, demonstrative evidence is expected to diminish resistance and foster openness among those less inclined to trust scientists. Thus, given these theoretical considerations, this study proposes the following hypothesis:

H5: Trust in scientists will moderate the effect of evidence type on (a) message acceptance and (b) policy support, such that demonstrative evidence (compared to testimonial) will be more effective among individuals with lower trust in scientists.

Artificial Intelligence (AI) as an emerging context for persuasion

The rise of generative AI tools such as ChatGPT and Gemini has transformed AI from a background computational tool into an active communicative agent. Unlike earlier

computing technologies, which served primarily as mediators of human-to-human interaction, generative AI now directly produces and delivers messages. In doing so, it increasingly functions as an independent source of persuasive communication across domains such as journalism, marketing, and public health.

This shift is also reflected in evolving theoretical frameworks. Earlier communication research distinguished between Human-Computer Interaction (HCI), which treated computers as social actors, and Computer-Mediated Communication (CMC), which viewed them as passive conduits. However, as AI has developed more adaptive and interactive capabilities, this boundary has eroded. Recent conceptual frameworks, including Artificial Intelligence-Mediated Communication (AI-MC) and Human-AI Interaction (HAI), now capture the communicative agency of AI more precisely. For instance, AI-MC is defined as “mediated communication between people in which a computational agent operates on behalf of a communicator by modifying, augmenting, or generating messages to accomplish communication or interpersonal goals” (Hancock et al., 2020, p.90). Similarly, HAI research emphasizes user perceptions, relational dynamics, and trust in AI entities such as chatbots, recommendation engines, and virtual assistants (Chen & Sundar, 2024; Sun et al., 2024).

As AI becomes a more common and recognizable author of persuasive content, it challenges the long-standing assumption that such messages are written by humans. It is increasingly no longer the default expectation that persuasive messages originate from human sources. As a result, source attribution has become a critical factor influencing how audiences interpret and evaluate such content. This shift raises a key question: Does attributing a message to AI rather than a human affect its persuasive impact? Indeed, in

practice, mainstream news outlets have published articles written entirely by generative AI (e.g., The Guardian, 2020). This practice has since expanded, with AI now frequently assisting human journalists even when it is not the sole author. Likewise, generative AI tools are being widely adopted across various fields to support effective message generation.

Empirical findings on this question remain mixed. Some studies suggest that AI-generated content can be effective, particularly when it is perceived as neutral, data-driven, and free from human bias (Lu et al., 2025). For example, algorithmically written news articles have been rated as more impartial and less ideologically slanted than those authored by humans, especially when the AI system is described as autonomous and technically proficient (Graefe et al., 2018; Wölker & Powell, 2021). Recent studies have also shown that, when message content is evaluated in isolation from its source, AI-generated content is often perceived as higher in quality compared to human-authored messages (Karinshak et al., 2023; Osborne & Bailey, 2025; Zhang & Gosline, 2023). For instance, Karinshak et al. (2023) have found that GPT-3–generated vaccine promotion messages were rated as more effective, contained stronger arguments, and elicited more positive attitudes compared to professionally written messages by the Centers for Disease Control and Prevention (CDC), when the source was not disclosed.

In contrast, other studies report the opposite pattern, suggesting that human-authored content is often perceived more favorably than AI-generated alternatives. This tendency is particularly pronounced in the field of automated journalism, which has long grappled with the question of whether audiences trust algorithmically produced content. For instance, Waddell (2018) has found that machine-generated news articles were

evaluated as significantly less credible than those authored by humans. Similarly, Henestrosa et al. (2023) have shown that human authors were perceived as more intelligent and competent overall. In another context, human voice assistants were rated as more credible and persuasive than AI-generated voices when correcting health misinformation (Dai et al., 2024). Importantly, this pattern persists even in recent studies involving generative AI. Although AI-generated content may be rated as high quality when evaluated without source information, participants tend to prefer messages labeled as human-authored once the authorship is disclosed (Osborne & Bailey, 2025). This discrepancy may reflect an underlying aversion toward AI or a general preference for human communicators over artificial ones. Even as AI grow more capable and accessible, these findings suggest that human attribution remains a powerful persuasive cue.

Beyond studies that favor one source over the other, a third group of findings reports no consistent differences. A recent meta-analysis of 121 studies concluded that AI and human communicators are, on average, equally persuasive across outcomes such as attitude change, perception, and behavioral intention (Huang & Wang, 2023). Similarly, while AI-generated content was viewed as more objective, it was also perceived as less expert than human-authored messages (Liu & Wei, 2018). This convergence of findings points to a broader ambiguity in how audiences process source cues, making it essential to empirically examine whether author attribution itself meaningfully shapes persuasive outcomes. Given these unresolved questions, this study poses the following research question:

RQ1: Does author attribution (AI vs. human) influence (a) message acceptance and (b) policy support?

While the source of a message (i.e., whether it is attributed to AI or a human) can influence its persuasive impact, this effect is not necessarily consistent across all individuals. According to the Modality, Agency, Interactivity, and Navigability (MAIN) model (Sundar, 2008), certain technological cues (affordances) activate cognitive heuristics that guide how audiences evaluate the credibility and the quality of a given message. Among the four key affordances proposed in the MAIN model, agency refers to the extent to which the source of a message is attributed to, or perceived to be attributed to, either a human or an AI agent. This perception of agency can influence credibility judgments and message interpretation. Therefore, attributing a message to a particular type of source may activate different heuristic processes and lead to varied persuasive outcomes.

One particularly relevant heuristic activated by AI-attributed messages is the machine heuristic, which is closely tied to the agency cue. The machine heuristic refers to a cognitive shortcut in which people assume that information generated by AI is more objective, impartial, and fact-based than information produced by humans (Sundar & Kim, 2019; Sundar, 2020). This belief is grounded in the notion that machines, unlike humans, operate without emotional or ideological bias. Therefore, individuals who are more inclined to trust technology may respond more favorably to AI-generated messages because these messages align with their expectations of neutrality and accuracy.

This psychological mechanism may help explain variation in how people react to source attributions. Specifically, individuals who strongly endorse the machine heuristic may be more receptive to AI-generated messages, whereas those who do not may prefer

messages from human sources. To account for this individual difference, the current study proposes the following hypothesis:

H6: Machine heuristic will moderate the effect of author attribution (AI vs. human) on (a) message acceptance and (b) policy support, such that AI-authored messages will be more effective among individuals with higher levels of machine heuristic.

In addition to examining AI-based persuasion through inherent technological characteristics of AI itself, the current study further investigates structural factors of AI-generated messages that potentially shape persuasive effectiveness. The study specifically investigates whether the persuasive effectiveness of evidence transparency distinguished as demonstrative versus testimonial evidence varies according to the author attribution of the message as either AI- or human-attributed, even when the message content remains identical. Considering evidence transparency as critical to enhancing message persuasiveness, this research integrates theoretical insights regarding argument quality and source attribution to explore possible interaction effects on persuasion outcomes. Accordingly, this study poses the following research question.

RQ2: Does the effect of evidence type (demonstrative vs. testimonial) on (a) message acceptance and (b) policy support differ depending on author attribution (AI vs. human)?

Mechanisms underlying persuasive effects: credibility and threats to freedom

Building upon the theoretical foundations regarding evidence presentation and author attribution outlined earlier, this study further investigates the potential mechanisms that help explain why certain messages are more persuasive than others.

Drawing from prior research, two key mediators emerge: message credibility and perceived threat to freedom. Both play important roles in shaping audience responses to persuasion and are relevant across both evidence types (demonstrative versus testimonial evidence) and author attributions (AI versus Human).

The first mechanism involves enhancing message credibility. It is a multifaceted construct, defined as “an individual’s judgment of the veracity of the content of communication” and is characterized as “complete, concise, consistent, well-presented, objective, representative, no spin, expert, will have impact, and professional” (Appelman & Sundar, 2016, p. 63). Credibility reflects a positive appraisal of a message’s high-quality traits. Studies consistently underscore the importance of credibility in persuasion, linking higher credibility to greater persuasion and subsequent changes in attitudes and behavioral intentions (Jennings & Russell, 2019; Pornpitakpan, 2004).

With respect to evidence presentation, the concept of evidence transparency is expected to significantly influence message credibility. Results from transparency research across disciplines such as journalism, health communication, and public administration consistently indicate that transparency enhances trust and credibility by allowing audiences to independently evaluate the quality and validity of information (Grimmelikhuijsen & Meijer, 2014; Johnson & Wiedenbeck, 2009; Kreuter et al., 2007; Peifer & Meisinger, 2021). In particular, studies have demonstrated that explicitly providing detailed methodological explanations and openly communicating uncertainties significantly improve perceptions of credibility and trustworthiness. Demonstrative evidence aligns closely with transparency principles by explicitly detailing the reasoning processes, methodologies, and analytical steps leading to conclusions, thereby

empowering audiences to independently evaluate the presented information. This explicit and comprehensive approach enhances perceptions of transparency, subsequently increasing message credibility and persuasive effectiveness. In contrast, testimonial evidence relies primarily on expert endorsements and emphasizes conclusions without providing detailed insights into the underlying reasoning or evidence-generation processes. Consequently, testimonial evidence is considered less transparent, potentially reducing its credibility and persuasive impact relative to demonstrative evidence. Therefore, demonstrative evidence is hypothesized to enhance message credibility, ultimately leading to more persuasive outcomes.

H7: The effect of demonstrative (vs. testimonial) evidence on (a) message acceptance and (b) policy support will be mediated by increased credibility.

Concerning author attribution, credibility may also mediate persuasive outcomes when comparing AI and human-authored messages. Scholarly discussions on AI-generated communication offer contrasting perspectives regarding credibility. On one hand, messages attributed to AI could potentially enhance credibility due to perceptions of neutrality, objectivity, and absence of human biases or agendas (Sundar & Lee, 2022).

On the other hand, AI attribution might diminish perceived credibility because of skepticism regarding AI's limitations, the presence of algorithmic biases, or audiences' preference for human-generated content rooted in familiarity, empathy, and trust (Zhang & Gosline, 2023). Exploring credibility as a mediator in AI versus human attribution contexts will clarify these competing theoretical claims and provide deeper insights into the dynamics of persuasion.

RQ3: Does credibility mediate the effect of author attribution (AI vs. human) on (a) message acceptance and (b) policy support?

The second mechanism, derived from psychological reactance theory, involves perceived threat to freedom. Psychological reactance theory posits that persuasive efforts can backfire if individuals perceive messages as threats to their freedom or autonomy, leading them to resist the persuasive attempt or endorse opposing viewpoints (Brehm, 1966; Brehm & Brehm, 1981). Prior research has identified specific message characteristics that commonly trigger reactance, including explicitly revealing persuasive intent (Benoit, 2007; Heller et al., 1973), using controlling and intense language such as must, and ought as opposed to subtle language (Miller et al., 2007; Quick et al., 2011), and framing a message in terms of potential losses rather than gains. Consequently, minimizing the perceived threat to freedom is crucial for effective persuasion.

In terms of evidence presentation, testimonial evidence may heighten perceived threats to freedom due to its reliance on authoritative endorsements, implicitly limiting audience autonomy and their ability to independently scrutinize message content. The authoritative tone combined with the limited transparency inherent in testimonial evidence can evoke a sense of coercion, thereby increasing psychological reactance. Demonstrative evidence, by contrast, alleviates these concerns by explicitly outlining methodological procedures, reasoning pathways, and foundational data. Such transparency fosters an environment conducive to audience autonomy, allowing individuals to freely and independently engage with the message content without feeling pressured. Consequently, demonstrative evidence is expected to enhance persuasive effectiveness by substantially reducing perceptions of threat to freedom.

H8: The effect of demonstrative (vs. testimonial) evidence on (a) message acceptance and (b) policy support will be mediated by reduced threat to freedom.

Regarding author attribution, similar considerations may apply. Audience perceptions of AI-attributed messages can either alleviate or exacerbate perceived threats to freedom, contingent upon their interpretation of AI intent and neutrality. On one hand, messages attributed to AI may be perceived as impartial and unbiased due to their non-human origin, potentially diminishing feelings of coercion and reactance. Conversely, AI-generated content might be viewed as rigid, prescriptive, or even manipulative, provoking psychological reactance rooted in mistrust, apprehensions about algorithmic biases, or perceptions of inadequate human empathy and nuanced communication. To investigate these possibilities clearly, this study examines threat to freedom as a potential mediator in the context of AI versus human author attribution:

RQ4: Does threat to freedom mediate the effect of author attribution (AI vs. human) on (a) message acceptance and (b) policy support?

## Chapter 3: Methods

### Pre-tests

#### Pre-Test 1

A series of pre-tests were conducted to develop and refine stimuli for effective manipulation. The first pilot test utilized Amazon Mechanical Turk (MTurk), evaluating four initial stimulus variations within a 2 (evidence type: demonstrative vs. testimonial)  $\times$  2 (author attribution: AI vs. human) factorial design, without including a control condition. Out of 92 responses initially collected, 16 incomplete responses (i.e., those not fully completed) were excluded, resulting in a final sample of 76 responses for analysis. All versions used the same article titled, “The climate crisis isn't coming, it's here, and these heat waves show why we need to act,” formatted realistically with a bold headline, author byline, timestamp, and a prominent image depicting scorching sunlight over a city.

Author attribution was manipulated by assigning different author names and providing corresponding brief author descriptions. The AI-attributed article explicitly listed ChatGPT as the author and included an explanatory note: “About the Author: This article was meticulously crafted by ChatGPT, an advanced artificial intelligence developed by OpenAI. ChatGPT generates text based on patterns learned from extensive datasets, enabling content creation across various topics.” Additionally, the introductory paragraph clearly disclosed AI authorship: “Committed to innovation and journalistic excellence, our newsroom is actively exploring the potential of generative artificial intelligence. The article you are reading has been written by ChatGPT, a generative AI technology, in response to the provided prompt.” In contrast, the human-attributed article

named “Jonathan Ross” as the author, omitting AI-related explanations, resulting in a slightly shorter article.

Regarding evidence presentation, testimonial evidence emphasized research conclusions through citations of experts and authoritative institutions such as the Environmental Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA), and the Intergovernmental Panel on Climate Change (IPCC). Representative statements included: “Experts like Dr. Emily Sanchez of the National Climate Assessment underscore the direct correlation between rising global temperatures and the intensity of heatwaves,” and “The Intergovernmental Panel on Climate Change (IPCC), a leading world authority, regards heatwaves as a signature of climate change.” Conversely, demonstrative evidence detailed research methodologies, data collection processes, and their implications, using accessible language and analogies, for example: “The EPA's method for analyzing this data mirrors a jeweler’s precision in assessing gem quality. The EPA set specific criteria, defining a heatwave as a period of two or more consecutive days with temperatures in the top 15% for July and August.”

The exact stimuli used in the first pre-test are included in Appendix A.2. Contrary to expectations, participants did not accurately categorize author attribution and clearly differentiate between evidence types. Regarding author attribution, most participants who read the AI-attributed article correctly identified the author as AI (n = 36, 87.8%). However, among participants who read the human-attributed article, over half mistakenly identified the author as AI (n = 21, 52.5%), resulting in only 47.5% (n = 19) correctly identifying the human author. This outcome suggests participants may have doubted the authenticity of the human source due to the prevalence of AI-generated information in the

current media environment, or they did not pay sufficient attention to the author information as anticipated.

Additionally, participants exhibited difficulty categorizing the evidence type correctly. Manipulation checks included four statements rated on a 7-point Likert scale to assess agreement. Two statements described testimonial evidence: “The article emphasized the consensus among experts regarding the issue,” and “The article focused more on summarizing conclusions from various studies, rather than explaining the methods and processes used in one specific research.” Conversely, two statements described demonstrative evidence: “The article clearly explained how the study reached its conclusion by detailing the research methods and findings,” and “The article extensively used opinions from various experts and institutions to clarify the issue.” Results from t-tests indicated no statistically significant differences between the testimonial and demonstrative evidence conditions for either set of statements (testimonial statements:  $t(77.43) = 1.00, p = .32$ ; demonstrative statements:  $t(77.80) = -0.76, p = .45$ ). Notably, participants who read demonstrative evidence scored slightly higher on testimonial statements ( $M = 5.29, SD = 0.89$ ) than participants who read testimonial evidence ( $M = 5.07, SD = 1.11$ ). Conversely, participants exposed to testimonial evidence scored somewhat higher on demonstrative statements ( $M = 5.32, SD = 0.89$ ) compared to those who read demonstrative evidence ( $M = 5.17, SD = 0.93$ ). Consequently, these results indicated a need for stronger manipulations to clearly distinguish author identity and effectively communicate differences between evidence types.

Pre-Test 2

The second pre-test was conducted to address and improve upon issues identified during the first pre-test (see Appendix 2.3). Participants were recruited via Amazon Mechanical Turk (MTurk). Out of the 126 responses initially collected, 20 incomplete responses were excluded. Consequently, 106 responses were included in the final analysis. Several modifications were implemented consistently across all experimental conditions. First, the primary message of the article was revised, shifting from the impact of climate change on severe heat waves to the potential submergence of American cities due to rising sea levels. This new focus was reflected in the revised title: “American Cities Are Sinking. They Could Be Gone By the Near Future,” accompanied by an updated image depicting climate protesters. Additionally, the design of the article was modified to adopt a Q&A format, in which responses are attributed either to a human expert or to AI, depending on the condition. To enhance clarity and engagement, each question was visually separated using shaded boxes and section headers. Moreover, all responses were accompanied by either a human profile photo or an AI icon, clearly indicating the source of the answer.

Author attribution was manipulated between conditions. In the human author condition, the article was attributed solely to “Jacob Freeman,” and the body text introduced the expert as “Dr. Tim Madden, a senior climate scientist at the Andlinger Center for Energy and the Environment at Princeton University.” The Q&A format reinforced the human authorship by directing the first question to the expert: “Dr. Madden, what does science say about the future of U.S. cities caused by climate change?” This phrasing emphasized that the article content was generated through human expertise.

In contrast, the AI condition included a joint byline, “By ChatGPT & Jacob Freeman,” and a prominently placed shaded box titled “What does it mean that one of the authors is ChatGPT?” This section clarified that the article was a collaboration between a human journalist and ChatGPT, an advanced AI model developed by OpenAI. The body of the article explicitly stated that the following content was curated by ChatGPT. In alignment with this framing, the first question in the article was phrased as “ChatGPT, what does science say about the future of U.S. cities caused by climate change?” rather than referencing a human expert. These changes clearly distinguished the AI condition from the human-authored version by emphasizing the involvement of generative AI instead of a named expert source.

In addition, evidence presentation was manipulated within the main body of the article. Regardless of whether the condition featured demonstrative or testimonial evidence, the core message of the article remained consistent. It argued that scientific research has found that American cities, particularly Miami, are at risk of sinking due to climate change. The article also emphasized the importance of both individual and policy-level actions to mitigate these harmful impacts.

In the demonstrative evidence condition, the article focused on predictive methodology by posing questions such as “What is a climate model and how does it predict future outcomes?” and “How reliable are these models?” The answers did not immediately present conclusions. Instead, they explained the procedures used to make predictions, introduced the concept of climate models, and used analogies to help readers understand the scientific process. This condition emphasized detailed explanations rather than citing expert opinions directly.

In contrast, the testimonial evidence condition included questions related to scientific consensus, such as “Is there scientific consensus on this threat?” and “How confident are scientists about the prediction?” The answers in this version centered on presenting scientific conclusions and listing institutions and scientists who support the argument. It also highlighted the strength of the consensus with statements such as, “This is not the view of a single scientist or research group. These conclusions are supported by multiple studies conducted by leading climate researchers worldwide.”

The results indicated that confusion regarding author attribution persisted from the first pretest into the second pretest. Similar to the initial findings, participants who read the AI-attributed article correctly identified the author as AI with high accuracy (96.2%,  $n = 51$ ). In contrast, correct author identification remained notably low among participants reading the human-attributed article; only 26.4% ( $n = 14$ ) correctly answered "no" to the question, "Did the article you read say that part of it was written by ChatGPT (a generative artificial intelligence)?" Conversely, 73.6% ( $n = 39$ ) incorrectly believed the human-attributed article was at least partially written by ChatGPT. This persistent misattribution, despite explicit statements indicating human authorship, suggests a broader skepticism among participants regarding the authenticity of human-generated content. These findings reflect growing uncertainty and diminished trust in author identification within an AI-saturated media environment, where the line between human and machine authorship is increasingly blurred.

Regarding the manipulation of evidence type (testimonial vs. demonstrative), results showed ~~only~~ minimal improvement relative to the first pretest. Manipulation checks comprised four statements for each evidence type, assessed on a 7-point Likert

scale measuring agreement. Statistical analyses revealed no significant differences between participants in the testimonial and demonstrative conditions for testimonial evidence descriptions,  $t(101.43) = -1.53, p = .13$ , nor for demonstrative evidence descriptions,  $t(101.43) = -1.53, p = .13$ . Despite these nonsignificant results, mean comparisons indicated a directionally appropriate trend. Specifically, participants exposed to testimonial evidence scored higher on testimonial manipulation checks ( $M = 5.55, SD = 0.84$ ) compared to those in the demonstrative condition ( $M = 5.28, SD = 0.95$ ). Likewise, those exposed to demonstrative evidence scored higher on demonstrative manipulation checks ( $M = 5.37, SD = 0.96$ ) compared to their testimonial counterparts ( $M = 5.17, SD = 1.25$ ). Although these differences did not achieve statistical significance, the directional consistency in mean scores suggests that the revisions to the stimuli were moving in the intended direction concerning evidence presentation clarity.

### Pre-Test 3

The third pre-test was conducted using CloudResearch after updating the stimuli (see Appendix A.4). In this revised version, the primary focus of the article was slightly adjusted to emphasize the specific case of Miami. Consequently, the article's title was updated to “Miami Beach Could be Under Water Most Days in the Near Future,” accompanied by an image depicting a person navigating floodwaters with a bicycle. Additionally, a control condition was included for the first time, featuring an article about the 2024 Nobel Prize laureate, matched in length to the other articles.

Other adjustments were made to author attribution. In the AI-attributed condition, the authors were consistently identified in the byline as ChatGPT and Jacob Freeman, accompanied by the same explanatory note from the second pre-test, clarifying ChatGPT’s involvement. The main content explicitly stated in the introductory paragraph

that the article was generated from ChatGPT's responses. Similarly, the human-attributed articles retained the previous byline format and explicitly indicated collaboration with "Dr. James Whitman, a climate scientist at MIT, to explore the impact of climate change."

Regarding evidence presentation manipulation, significant enhancements were implemented to emphasize the distinctive characteristics of each evidence type, aside from the two shared questions: "What challenges do American cities face from climate change, with Miami as a key example?" and "How would this affect Miami?"

First, the demonstrative evidence condition included three additional questions: "How do scientists measure sea level?" "How much has sea level risen recently, and what are the predictions for the future?" and "How do scientists use sea level data to make future predictions?" These questions systematically guided participants through the scientific process, from data collection to predictive modeling.

Conversely, the testimonial evidence condition introduced three distinct questions: "Does science agree with climate predictions?" "What is the IPCC, and which scientists were involved?" and "Is there scientific consensus about the predictions of sea level rise caused by climate change?" Responses in this condition reinforced the strength and authority of scientific consensus and expert involvement in climate research.

Initially, 357 responses were collected. After removing incomplete responses, 310 participants remained for analysis. Participants were randomly assigned to one of five articles corresponding to the experimental design: four treatment groups (demonstrative evidence with AI attribution, demonstrative evidence with human attribution, testimonial evidence with AI attribution, and testimonial evidence with human attribution) and one

control article that was unrelated to climate change. The sample was generally distributed equally across conditions (see Table 1).

Table 1

Final Pre-Test Experimental Condition Assignment

	Evidence Presentation		
	Demonstrative evidence	Testimonial evidence	Control
AI-attributed	n = 64	n = 59	n = 61
Human- attributed	n = 60	n = 66	

After reading the assigned news article, participants answered several questions about its content. The first question asked, “What was the article about?” with two response options: “climate change” or “Nobel prize.” This item served as a manipulation check to differentiate the control article from the four treatment groups. Those who read the climate-related article all categorized it as climate change (n = 249, 100%).

A second manipulation check addressed author attribution with the question, "Did the article you read clearly state that part of it was written in collaboration with ChatGPT (a generative AI)?" Participants responded with either “yes” or “no.” A chi-square test confirmed successful manipulation, with participants in the AI-authored condition accurately identifying the AI authorship in 99.19% of cases (n = 122), only 1 incorrect answer, while participants in the human-authored condition correctly recognized human authorship 78.72% of the time (n = 148).

Next, two approaches were employed to verify the manipulation of demonstrative and testimonial evidence: (1) tally questions and (2) evidence quality questions. Given that these concepts were specifically introduced for this study, a thorough evaluation was

necessary. The first approach, tally questions, consisted of yes-or-no items designed to capture whether each article included certain specific details. These items were divided into demonstrative tally questions and testimonial tally questions. Demonstrative tally questions referred to specific details from the demonstrative evidence articles, while testimonial tally questions referenced details from the testimonial evidence articles.

The demonstrative tally questions were: “Did the article mention so-called ‘King Tide flooding’?” “Did the article explain how ‘thermal expansion’ works?” “Did the article talk about the melting ice from glaciers or polar ice sheets?” and “Did the article mention methods for measuring sea level, like tide gauges, satellite altimetry, Argo floats, or GRACE satellites?” ( $M = 0.57$ ,  $SD = 0.40$ ). In comparison, the testimonial tally questions included: “How many scientists were quoted in the article?” “Did the article reference multiple scientific organizations such as IPCC, NOAA, and NASA?” and “Did the article explain how the Intergovernmental Panel on Climate Change (IPCC) works?” ( $M = 0.33$ ,  $SD = 0.39$ ).

Responses of “yes” were coded as 1 and “no” as 0. Scores were calculated by averaging items within each category (demonstrative or testimonial). A one-way ANOVA revealed a significant effect of condition on testimonial tally questions,  $F(2, 307) = 95.32$ ,  $p < .00$ . Tukey’s HSD indicated that participants in the testimonial condition ( $M = 0.83$ ,  $SD = 0.22$ ) scored significantly higher than those in the control ( $M = 0.15$ ,  $SD = 0.27$ ,  $p < .001$ ) and demonstrative ( $M = 0.53$ ,  $SD = 0.41$ ,  $p < .001$ ) conditions. Similarly, a separate one-way ANOVA for demonstrative tally questions also showed a significant effect,  $F(2, 307) = 46.78$ ,  $p < .001$ . Follow-up Tukey’s HSD test demonstrated that participants in the demonstrative condition ( $M = 0.55$ ,  $SD = 0.41$ ) scored

significantly higher than those in the testimonial; ( $M = 0.39$ ,  $SD = 0.33$ ,  $p < .001$ ) and control ( $M = 0.06$ ,  $SD = 0.16$ ,  $p < .001$ ) conditions.

The second approach, evidence quality questions, assessed conceptual aspects of each evidence rather than specific details measured by the tally questions. Participants rated their agreement with statements designed to measure demonstrative and testimonial evidence quality using a 7-point scale (1 = Strongly Disagree, 7 = Strongly Agree). Demonstrative evidence quality statements focused on the thoroughness and clarity of explanations regarding data collection methods and analytical procedures, whereas testimonial evidence quality statements emphasized the degree of expert consensus and authoritative references presented within the article.

The demonstrative evidence quality consisted of three statements: “The data and methods used to reach conclusions in the article were explained in detail with specifics,” “The information presented in the article explained how sea level data is used to predict climate change,” and “The article specifically explained how data is collected and analyzed for making sea level projections.” ( $M = 4.67$ ,  $SD = 1.58$ , Cronbach’s alpha = .87). The testimonial evidence quality also included three statements: “The article emphasized the consensus among experts regarding the issue,” “The article focused on quoting authorities rather than explaining the technical process behind the research,” and “The article referenced a lot of different experts and scientists to support the claims made.” ( $M = 4.70$ ,  $SD = 1.58$ , Cronbach’s alpha = .84)

Mean values for demonstrative and testimonial evidence quality were calculated, and separate one-way ANOVAs were conducted. For testimonial evidence quality, the ANOVA found a significant effect of experimental condition,  $F(2, 307) = 47.42$ ,  $p$

< .001,  $\eta^2 = .24$ . Tukey's HSD post hoc test confirmed that participants in the testimonial condition ( $M = 5.50$ ,  $SD = 0.92$ ) rated testimonial evidence quality significantly higher than those in both demonstrative ( $M = 4.54$ ,  $SD = 1.68$ ,  $p < .001$ ) and control ( $M = 3.43$ ,  $SD = 1.50$ ,  $p < .001$ ) conditions. Similarly, for demonstrative evidence quality, ANOVA results also showed a significant effect of condition,  $F(2, 307) = 50.79$ ,  $p < .001$ ,  $\eta^2 = .25$ . Tukey's HSD comparison confirmed that participants in both the demonstrative ( $M = 5.13$ ,  $SD = 1.27$ ) and testimonial ( $M = 5.00$ ,  $SD = 1.32$ ) conditions provided significantly higher ratings than those in the control condition ( $M = 3.09$ ,  $SD = 1.66$ ). However, no statistically significant difference was found between demonstrative and testimonial conditions ( $p = .73$ ).

Overall, evidence type manipulation showed considerable improvement compared to earlier pre-tests. Specifically, results from both the tally questions and the testimonial evidence quality questions demonstrated effective categorization in line with the intended experimental conditions. However, despite the demonstrative condition achieving the highest mean score ( $M = 5.13$ ) for demonstrative evidence quality, the lack of statistical difference compared to the testimonial condition ( $M = 5.00$ ) suggested that participants exposed to testimonial evidence may have inaccurately perceived the presence of methodological and analytical details typically associated with demonstrative evidence. Given that the testimonial articles prominently featured statements from various scientists and authoritative institutions, participants, particularly those reading quickly or superficially, may have mistakenly inferred that detailed methodological explanations were also present.

In comparison to earlier pre-tests, these results reflected meaningful progress in distinguishing between evidence types, confirming the general effectiveness of the manipulations. Nevertheless, the absence of a statistically significant difference between demonstrative and testimonial conditions for demonstrative evidence quality suggests that further refinements could further enhance the distinctiveness of the demonstrative condition. Based on these insights, final adjustments were made to optimize alignment with each experimental condition and ensure a clearer differentiation of demonstrative and testimonial evidence.

#### Final Manipulation Revision

Following a series of pre-tests, stimuli for the main study were finalized with substantial modifications aimed at improving clarity, readability, and logical flow (see Appendix A.1). The article title was updated to “Miami Beach’s Future at Risk: How Rising Seas Could Make the City Uninhabitable,” visually integrated with a background image instead of placing the image below the title and byline as previously done. Immediately following the title, author attribution was explicitly provided, clearly distinguishing between human and AI authors through the inclusion of either a human profile photo or an AI icon.

Inspired by the New York Times (NYT) article titled “The Science of Climate Change Explained” (Rosen, 2021), the article included a concise summary of all main questions immediately following the introductory paragraph to enhance navigation and facilitate rapid content processing. After a concise introductory paragraph summarizing the main theme, a rectangular box prominently listed all four questions addressed in the

article, facilitating rapid navigation and content comprehension, critical considerations for survey-based experimental conditions, especially for inattentive participants.

The main content was organized into two distinct evidence types: demonstrative and testimonial. The demonstrative evidence condition highlighted scientific methodologies and processes with questions including: “Why Is Climate Change Raising Sea Levels?” “How Do Scientists Measure Sea Levels?” “How Do Scientists Forecast the Future of Rising Seas?” and “What Does Science Say About Miami’s Future?” Conversely, the testimonial evidence condition emphasized expert authority and scientific consensus, featuring questions such as: “Which Experts and Institutions Support Climate Predictions for Miami?” “What Makes the IPCC a Credible Source for Climate Science?” “Do Experts Agree on the Predictions for Rising Seas?” and “What Does Science Say About Miami’s Future?”

Also, to minimize potential confusion regarding author attribution, the AI-authored condition clearly indicated ChatGPT as the sole author, removing any human co-authorship, while the human-attributed condition was listed human expert and journalists in the article. On top of that, visual design elements such as question boxes and author profile photos or icons were removed to streamline the presentation.

Lastly, the control condition underwent minor adjustments, presenting a similarly structured article highlighting historical and recent literary achievements, thus ensuring consistency in length and narrative style with the experimental articles.

## Main study

### Experimental Design

A between-subjects experiment was conducted using a 2 (Evidence presentation: testimonial vs. demonstrative evidence)  $\times$  2 (Author attribution: AI vs. human) plus one control condition between-subjects design. All treatment conditions were given the news articles discussing the impact of climate change in Miami, specifically the prediction that Miami could experience severe flooding 200-300 days a year in the near future due to rising sea levels caused by climate change. In contrast, the control condition received a news article about the 2024 Nobel Prize laureates, which was completely irrelevant to climate change.

The topic of climate change was intentionally chosen for two key reasons. First, while climate change is a scientifically established and widely accepted phenomenon among experts, it remains a politically charged issue, making it suitable for studying persuasion strategies in the context of politically polarized topics, particularly among individuals who distrust experts. Second, rather than addressing broad, well-established facts about climate change, such as its anthropogenic nature, the study focused on a specific consequence of climate change. Public acceptance of climate change and recognition of its human-driven causes have steadily increased, with the majority of Americans now acknowledging that climate change is primarily anthropogenic (Gallup, 2024; Leiserowitz et al., 2024). However, greater divergence persists in public perceptions regarding the impacts of climate change, or at least in the range of perceived severity of these impacts (Leiserowitz et al., 2024). For instance, more than half of Americans currently do not believe climate change will pose a significant threat within

their own lifetimes (Sadd, 2023). Therefore, to better reflect real-world discussions and public debates surrounding climate change, the article focused on the increasing likelihood of regular flooding in Miami as a direct consequence of rising sea levels.

An a priori power analysis using G\*Power found that the experiment requires a minimum of 196 participants to achieve a power of .80 with a medium effect size ( $f = .25$ ). However, to increase sensitivity and detect smaller yet theoretically meaningful experimental effects, the final sample size was substantially increased to over 1,000 participants. This decision was guided by an additional G\*Power analysis, which suggested that a sample size of at least 1,199 participants would be necessary to achieve .80 power for detecting a small effect size ( $f = .10$ ). This adjustment was further justified by the final pre-test results, which did not yield statistically significant outcomes, presumably due to the limited sample size initially calculated for a medium effect. Practically, medium effect sizes are challenging to detect in message-effects research due to the subtle nature of persuasive influences (O’Keefe & Hoeken, 2021), reinforcing the necessity of this larger sample.

### Manipulation

Five distinct news articles were developed, each closely mirroring a realistic online news format. These five stimuli are provided in Appendix A. Each article featured a title, an author byline accompanied by a brief author description, and content structured in a question-and-answer format. Author attribution was explicitly manipulated to indicate whether the article was created by an AI (ChatGPT) or a human expert. This explicit attribution was intentionally chosen because news consumers typically pay

limited attention to the sources of news stories (Amazeen & Muddiman, 2018). Within each article, either an AI or a human expert responded to questions related to the topic.

In the AI-attributed condition, a message explicitly identified AI as the author. Instead of a human profile photo, an AI-generated icon was displayed alongside the author name “ChatGPT.” Accompanying this was an explanatory note stating, “ChatGPT, a Generative AI, is a type of artificial intelligence designed to create new content by analyzing patterns it has learned from vast datasets.” Additionally, the first sentence of the article clearly attributed authorship by stating, “ChatGPT addresses this issue through the four key questions below.

In contrast, articles in the human-attributed condition were identical in content but presented as written by a human expert. These articles featured a realistic profile photograph and introduced the author as “James Preston,” a generic American name generated via ChatGPT. The accompanying biography noted, “Dr. Preston is a climate scientist and journalist with a Ph.D. in environmental studies, specializing in the impacts of climate change on coastal communities.” To maintain consistency in formality and structure with the AI-attributed condition, the first line of the human-attributed articles was adjusted to read: “Dr. Preston explores this issue through the four key questions below.”

Evidence type was manipulated according to definitions of testimonial and demonstrative evidence. Across all conditions, articles described the potential ramifications of climate change for Miami in the near future; however, the manner in which this information was presented varied depending on the evidence condition.

Articles employing testimonial evidence emphasized authority and scientific consensus regarding anticipated severe weather events expected in Miami.

#### Testimonial evidence manipulation

The testimonial evidence article began with a brief introductory paragraph outlining predicted climate change impacts on Miami, stating, “By the end of the century, near-daily flooding could render parts of Miami Beach uninhabitable, severely threatening the city’s homes, businesses, and infrastructure.” This opening sentence was identical across all conditions, explicitly introducing the anticipated consequences of climate change for the Miami area.

Subsequently, the testimonial evidence content was structured around four key questions, each followed by corresponding answers emphasizing scientific consensus and expert authority. The first question, “Which experts and institutions support climate predictions for Miami?” highlighted authoritative institutions and expert testimony, including: “The alarming forecasts about Miami’s future are supported by some of the world’s most trusted scientific institutions, including NASA, the National Oceanic and Atmospheric Administration (NOAA), and the Intergovernmental Panel on Climate Change (IPCC).” Expert quotes further emphasized certainty, such as Dr. David Miller from Columbia University stating, “The science is unequivocal: without significant emissions reductions, coastal cities like Miami face severe risks.”

The second question asked, “What makes the IPCC a credible source for climate science?” Building upon the previous answer, this section elaborated on the IPCC's authoritative status, stating: “The IPCC (Intergovernmental Panel on Climate Change) is recognized as the most authoritative international body on climate change. Established by

the United Nations, it synthesizes peer-reviewed research from thousands of scientists across diverse disciplines.” Additionally, Dr. Emily Parker, a senior researcher at NOAA, explained, “The IPCC’s findings are the gold standard in climate science, representing the consensus of the world’s leading experts.”

The third question directly addressed expert agreement, asking, “Do experts agree on the predictions for rising seas?” The response underscored strong scientific consensus, illustrated by quotes from prominent scientists such as Dr. John Williams from the University of Miami, who emphasized, “The level of alignment among experts is unprecedented. While minor specifics may vary, the overarching conclusions about the dangers of sea level rise are indisputable.” This consensus was further reinforced by references to leading organizations, including the American Meteorological Society, the Union of Concerned Scientists, and the National Academy of Sciences.

The final question in the testimonial evidence condition, “What does science say about Miami’s future?” reiterated and summarized the predicted climate impacts detailed at the beginning of the article, emphasizing that “By the middle of the century, large sections of the city could experience regular flooding, and by the end of the century, flooding could occur almost daily.” This closing section was consistent across conditions, including demonstrative evidence.

#### Demonstrative evidence manipulation

Demonstrative articles emphasized transparency in data collection, measurement, and analytical procedures. The initial paragraph of the demonstrative articles matched the testimonial version, clearly stating the predicted climate change consequences for Miami:

“By the end of the century, near-daily flooding could render parts of Miami Beach uninhabitable, severely threatening the city’s homes, businesses, and infrastructure.”

However, subsequent content differed, focusing on scientific processes rather than expert consensus. The first question asked, “Why is climate change raising sea levels?” explicitly addressing the foundational science behind the flooding prediction. The answer provided clear, accessible explanations, such as: “First, oceans absorb over 90% of the heat trapped by greenhouse gases, causing the water to expand—a process called thermal expansion. Second, as global temperatures rise, ice sheets and glaciers melt at an accelerated rate, adding massive amounts of water to the oceans.” Additional context linked these processes directly to local effects, specifically mentioning seasonal King Tides: “These rising seas are already having visible impacts in Miami Beach, most notably during seasonal King Tides, naturally occurring high tides driven by gravitational alignments of the sun and moon.”

The second question, “How do scientists measure sea levels?” detailed specific methodologies and tools for sea level measurement. The explanation included precise descriptions of measurement instruments: “Tracking sea level changes involves a combination of advanced tools, including tide gauges, satellites like GRACE (Gravity Recovery and Climate Experiment), and Argo floats. Tide gauges, placed along coastlines, monitor ocean height relative to fixed land points, while satellites like GRACE measure changes in Earth’s gravitational field caused by melting ice.”

The third question, “How do scientists forecast the future of rising seas?” integrated previous explanations by outlining how data are processed to develop forecasts. It introduced climate models as analytical tools: “Using the data collected from

these tools, scientists build climate models, powerful computer programs designed to simulate future conditions.” To facilitate reader understanding, these models were described through an accessible analogy, referring to them as “advanced ‘what-if’ machines” capable of running multiple hypothetical scenarios. For example, the article explained, “The model runs thousands of virtual experiments to test what might happen under various scenarios. For example, it might calculate what would occur if global temperatures rise by 2 degrees Celsius, causing ice sheets to melt faster and send more water into the oceans.”

Finally, the demonstrative article concluded identically to the testimonial condition, addressing the question “What does science say about Miami's future?” and reiterating the predicted severity and impacts of sea-level rise. This closing paragraph emphasized direct consequences for Miami, aligning closely with the message acceptance measures employed in the study.

#### Procedure and participants

For participant recruitment, this study utilized CloudResearch, an online platform for human-subjects data collection. Recent research assessing data quality across various data collection platforms, conducted by Douglas and colleagues (2023), has affirmed the high data quality offered by CloudResearch. Specifically, participants on this platform demonstrate greater attentiveness to study instructions, a heightened comprehension of research tasks, and a consistent track record of providing reliable responses over time. This enhanced data quality has prompted recent studies across diverse fields, spanning from political science (Badas & Schmidt, 2023) to psychology (Galvan et al., 2023), to opt for CloudResearch as their chosen recruitment platform.

Once participants gave consent to take part in the experimental survey, they answered a series of initial questions. Before exposure to the experimental stimuli, trust in scientists was assessed. Participants were then randomly assigned to one of five conditions, resulting in a relatively even distribution of sample sizes (see Table 2) ranging from 273 to 293. In total, 582 participants read a demonstrative evidence article, 580 read a testimonial evidence article, and 273 read the control article. Concerning author attribution, 584 participants received an AI-authored article, and 578 received a human-authored article. When the control article was counted as human-authored, this figure increased to 851. However, in subsequent analyses addressing author attribution (hypothesis and research question testing), the control condition was excluded to compare AI and human authorship for identical climate change content. A minimum time limit of 25 seconds was imposed on the article section to ensure sufficient reading of the material.

After reading the assigned article, participants responded to manipulation check items and additional measures, including two mediators (credibility and threat to freedom), two outcome variables (message acceptance and policy support), a moderator (machine heuristic), and demographic questions. On average, the survey took 13 minutes to complete, and each participant received \$1.50 as compensation.

Table 2

Main Study Experimental Condition Assignment

	Evidence Presentation		
	Demonstrative evidence	Testimonial evidence	Control
AI-attributed	n = 293	n = 291	n = 273
Human-attributed	n = 289	n = 289	

Initially, 1,438 responses were collected. Incomplete responses were automatically filtered out by CloudResearch during recruitment. Among these, three responses were removed from the dataset based on two attention check questions. The first attention check question asked participants to select the color purple from a list of colors, and all participants answered correctly. The second check instructed participants to write a one-sentence summary of the article they had just read. All responses were reviewed. Three participants who left this item blank were excluded from analyses. All other participants provided relevant summaries, which were judged to reflect engagement with the reading task. These responses ranged from general (e.g., climate change, Miami climate, Nobel Prize) to more detailed (e.g., how climate change causes increased flooding potential in Miami and how scientists and researchers gauge changes to said potential flooding). After removing the three blank responses, 1,435 valid responses remained for the final analysis.

Participant ages ranged from 19 to 84 years ( $M = 46.80$ ,  $SD = 15.90$ ). The sample included 747 female participants (52.06%), 673 male participants (46.90%), 13 participants identifying as non-binary, and 2 identifying as other. Most participants identified as White (73.59%,  $n = 1,056$ ), followed by Black or African American (14.01%,  $n = 201$ ), Asian (6.27%,  $n = 90$ ), Hispanic (4.46%,  $n = 64$ ), and Other (1.39%,  $n = 20$ ). Two participants identified as American Indian or Alaska Native (0.14%), and two identified as Native Hawaiian or Pacific Islander (0.14%).

In terms of education, 39.37% ( $n = 565$ ) held a four-year degree, 11.64% ( $n = 167$ ) held a two-year degree, 20.91% ( $n = 300$ ) had completed some college, 10.73% ( $n = 154$ ) were high school graduates, and 0.35% ( $n = 5$ ) had not completed high school. An

additional 13.52% (n = 194) held a master's or doctoral degree, and 3.48% (n = 50) held a professional degree.

Regarding religious affiliation, 32.68% (n = 469) reported having no particular religious preference, 33.10% (n = 475) identified as Protestant, and 19.02% (n = 273) identified as Roman Catholic. The remaining participants identified with various other religious traditions, including Jewish (1.81%, n = 26), Buddhist (0.98%, n = 14), Mormon (0.84%, n = 12), Muslim (1.05%, n = 15), Hindu (0.35%, n = 5), Orthodox Christian (0.42%, n = 6), and other religions (9.76%, n = 140).

## Measures

### Message Credibility

The measurement of message credibility was adapted from the study by Appelman and Sundar's study (2016) which defines credibility as an individual's judgment of a message's truthfulness. Of the three original items: accurate, authentic, and believable, two (accurate and believable) were chosen because they best fit the context of this study. In addition, two new items, credible and trustworthy, were included. Respondents were asked to rate how much they agreed with the following descriptions of the article in a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree): 1) accurate, 2) believable, 3) credible, and 4) trustworthy. Responses were recorded ( $M = 5.31$ ,  $SD = 1.44$ , Cronbach's alpha = .97).

### Threat to freedom

Threat to freedom refers to an external factor that prevents an individual from exercising their independence and free will to (or not to) engage in a specific behavior (Brehm, 1966). It was assessed using four items commonly employed in prior research on

the topic (Dillard & Shen, 2005) including “The news article tried to manipulate me,” “The news article tried to make a decision for me,” “The news article threatened my freedom to choose,” and “The news article tried to persuade me.” ( $M = 3.13$ ,  $SD = 1.61$ , Cronbach’s alpha = .90)

### Machine Heuristic

Machine heuristic refers to a mental shortcut in which individuals attribute machine-like qualities or automated processes when forming judgments about the outcomes of interactions (Sundar, 2008; Sundar & Kim, 2019). A recent study (Yang & Sundar, 2024) introduced an updated machine heuristic scale, accounting for the expansion of features and capabilities of advanced machines like AI, which can handle both mechanical and traditionally human-centered tasks. Given the study’s focus on comparing the persuasive effect of AI versus human-attributed content, this construct was measured using a scale adapted from Yang and Sundar’s (2024) machine heuristic scale, specifically reflective indicators. Participants rate their agreement with 7 statements, including: “AI is more reliable than humans in accurately reporting scientific information.” “AI is more dependable than humans in accurately reporting scientific information,” “I trust AI more than humans in accurately reporting scientific information,” “I am more confident in AI than humans in accurately reporting scientific information,” “I believe AI is more competent than humans in accurately reporting scientific information,” “I have a higher expectation for AI than humans in accurately reporting scientific information,” and “AI is better than humans in accurately reporting scientific information.” ( $M = 3.07$ ,  $SD = 1.47$ , Cronbach’s alpha = .97).

## Trust in scientists

Following recent scholarly discussions on the conceptualization of trust in scientists (Besley et al., 2021; Besley & Tiffany, 2023), this study adopts a multidimensional approach to measuring trust. Specifically, trust in scientists is assessed across five key dimensions: competence, integrity, benevolence, and openness. The measurement items were adapted from existing validated scales (Cologna et al., 2025; Mede et al., 2025). Each dimension is measured using two items, resulting in a total of ten items. The survey employs a semantic differential question format, where participants respond to bipolar adjective scales. For example, participants were asked, "How honest or dishonest are environmental scientists?", with response options ranging from very dishonest to very honest. Other semantic differentials include scales such as very inexpert – very expert, very unintelligent – very intelligent, very unethical – very ethical, and very unwilling (to be transparent) – very willing. ( $M = 5.51$ ,  $SD = 1.25$ , Cronbach's alpha = .94)

## Message Acceptance

Message acceptance assesses the persuasive power of a given message by evaluating how much individuals accept its claims. It was measured with 6 items, corresponding to the arguments presented in the article about climate change. Participants rated their agreement with statements such as: "Rising sea levels caused by climate change pose a serious threat to Miami Beach," "By the middle of the century, large sections of Miami Beach will experience regular flooding due to rising sea levels," "Without significant action, flooding in Miami Beach could occur almost daily by the end

of the century,” “I doubt that Miami Beach will actually be in danger of regular flooding anytime soon (recoded),” and “Miami Beach will become uninhabitable if sea levels continue rising as projected.” ( $M = 5.35$ ,  $SD = 1.54$ , Cronbach’s  $\alpha = .93$ ).

#### Policy support

Policy support refers to the degree to which individuals advocate for climate-related initiatives at the policy level, aligning with the themes presented in the news article they were exposed. To measure this construct, participants were asked: “To what extent do you support or oppose the following policies?” Responses were recorded on a 7-point Likert scale, ranging from 1 (Strongly Oppose) to 7 (Strongly Support).

Participants evaluated their support for seven specific climate policies, including “Eliminating funding for government programs dedicated to climate action,” “Rejoining international climate treaties (e.g., Paris Agreement),” “Implementing carbon taxes on greenhouse gas emissions,” “Setting enforceable caps on fossil fuel emissions for industries,” “Mandating energy efficiency standards for personal vehicles and household appliances,” “Taxing corporations based on carbon emissions,” and “Requiring power plants to eliminate all carbon emissions by 2040.” ( $M = 4.89$ ,  $SD = 1.84$ , Cronbach’s  $\alpha = .96$ ).

#### Manipulation check

##### Presentation of evidence

Similar to the final pretest, two measures were used to confirm the successful manipulation of evidence type (demonstrative vs. testimonial): tally questions and quality questions (see Figure 1).

Tally question check. Tally questions required participants to indicate whether they noticed specific information in the article by responding either “yes” (coded as 1) or

“no” (coded as 0). Four demonstrative tally questions examined items such as “Did the article mention the so-called ‘King Tides’?” “Did the article explain how ‘thermal expansion’ works?” “Did the article talk about the melting ice from glaciers or polar ice sheets?” and “Did the article mention methods for measuring sea level, like tide gauges, satellite altimetry, Argo floats, or GRACE satellites?”

Meanwhile, three testimonial tally questions addressed content such as “Did the article explain how the Intergovernmental Panel on Climate Change (IPCC) works?” “Did the article reference multiple scientific organizations such as NASA, NOAA, and IPCC?” and “Did the article include multiple quotes from different climate scientists?”

Before the analysis, scores for each set of tally items were calculated by taking their mean, resulting in scales ranging from 0 to 1. Two one-way ANOVAs showed that both evidence types were manipulated as intended. For demonstrative tally questions, there was a significant difference among conditions,  $F(2, 1432) = 2276, p < .001$ .

Participants who read demonstrative articles ( $M = 0.90, SD = 0.19$ ) scored higher on these items than those in both the control ( $M = 0.05, SD = 0.17, p < .001$ ) and testimonial ( $M = 0.16, SD = 0.26, p < .001$ ) conditions. Similarly, for testimonial tally questions, there was a significant difference among conditions,  $F(2, 1432) = 1489, p < .001$ .

Participants who read testimonial articles ( $M = 0.93, SD = 0.17$ ) scored higher than those in the demonstrative ( $M = 0.23, SD = 0.33, p < .001$ ) and control ( $M = 0.09, SD = 0.26, p < .001$ ) conditions.

To clearly illustrate the results and avoid potential confusion from averaged scores, tally responses were also summarized based on total scores as opposed to means, as presented in Tables 3 and 4. Table 3 specifically summarizes responses to the four

demonstrative tally questions, reporting frequencies and percentages for each condition. The results showed that 70.96% of participants in the demonstrative condition correctly identified all four items, compared to only 3.1% in the testimonial condition and 1.1% in the control condition.

Moreover, Table 4 summarizes responses to the three testimonial tally questions, revealing that 80.86% of participants in the testimonial condition incorrectly identified all items, where as the majority of participants in the demonstrative (61%) and control (86.45%) conditions answered “yes” to none of the testimonial evidence related details.

Table 3

Summary of Responses to Demonstrative Tally Questions

	0	1	2	3	4
Demonstrative	5 (0.86%)	8 (1.37%)	38 (6.53%)	118 (20.27%)	413 (70.96%)
Testimonial	364 (62.76%)	116 (20.00%)	58 (10.00%)	24 (4.14%)	18 (3.10%)
Control	246 (90.11%)	12 (4.40%)	8 (2.93%)	4 (1.47%)	3 (1.10%)

Note. The numbers in each cell represent frequencies, with percentages indicated in parentheses. Numbers in the first row (0–4) represent how many "yes" responses participants gave. The total number of demonstrative tally items was four.

Table 4

Summary of Responses to Testimonial Tally Questions

	0	1	2	3
Demonstrative	355 (61.00%)	111 (19.07%)	66 (11.34%)	50 (8.59%)
Testimonial	3 (0.52%)	6 (1.03%)	102 (17.59%)	469 (80.86%)
Control	236 (86.45%)	12 (4.40%)	11 (4.03%)	14 (5.13%)

Note. The numbers in each cell represent frequencies, with percentages indicated in parentheses. Numbers in the first row (0–3) represent how many "yes" responses participants gave. The number of items measuring the testimonial tally was 3.

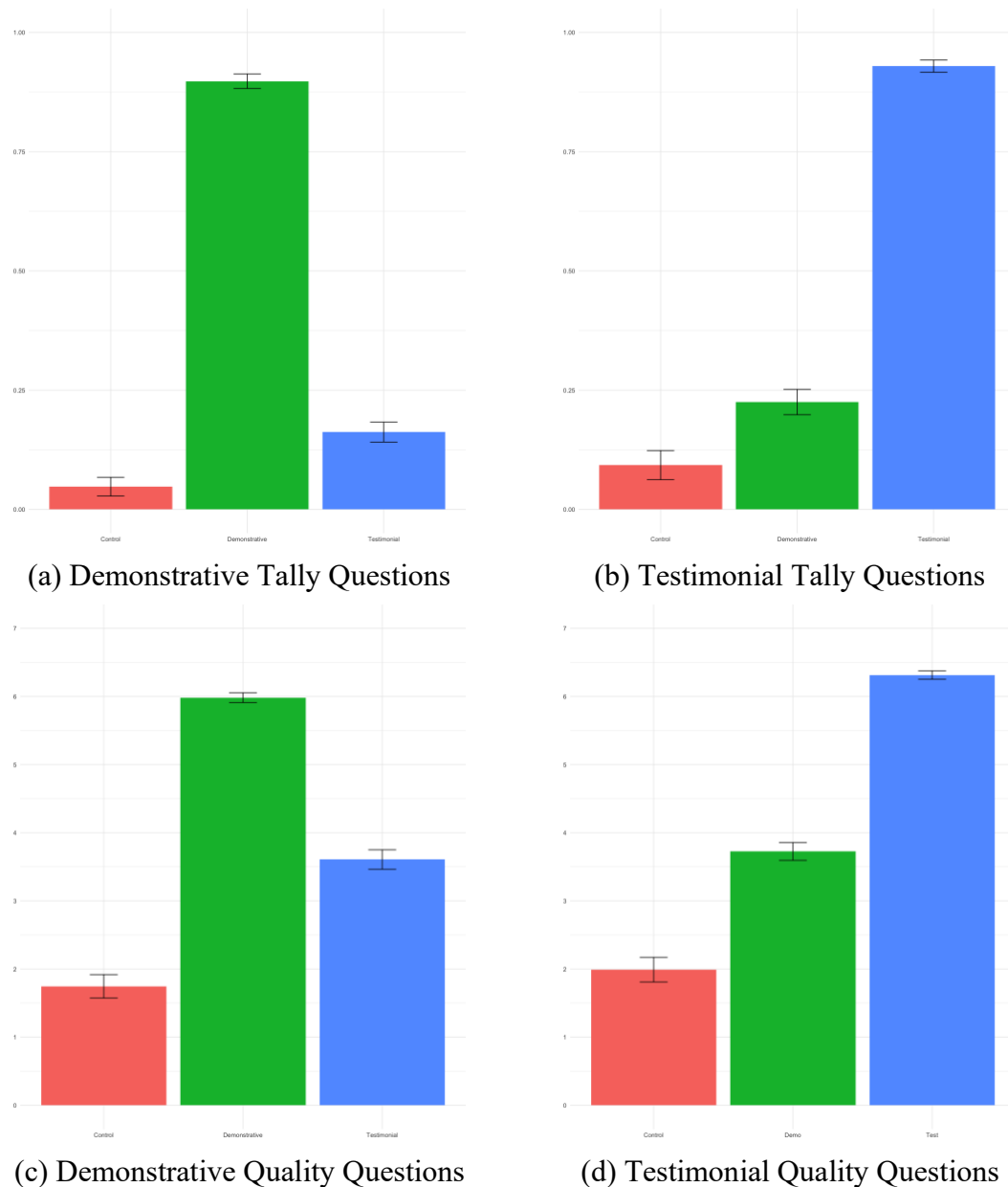
Quality question check. Quality questions focused on participants' overall impressions of how each article presented its evidence. Three demonstrative quality statements were rated on a 7-point Likert scale (1 = Strongly disagree, 7 = Strongly agree) and included the items: "The article walked me through how sea level data is measured, detailing tools like tide gauges and satellites," "The article explained how scientists input real-world data into climate models to predict future flooding in Miami Beach," and "The article provided a detailed look at how sea level data are analyzed before drawing conclusions about climate change." Three testimonial quality statements emphasized expert consensus and institutional credibility, for example, "The article highlighted the scientific consensus among leading experts and institutions," "The article cited multiple scientists and institutions to support its claims about rising sea levels," "The article emphasized the credibility of the IPCC (Intergovernmental Panel on Climate Change) to support its conclusions on sea-level rise."

Two additional one-way ANOVAs confirmed that the evidence-type manipulation was successful. For demonstrative quality questions, the demonstrative condition ( $M = 5.98$ ,  $SD = 0.90$ ) produced significantly higher ratings than testimonial ( $M = 3.61$ ,  $SD = 1.75$ ,  $p < .001$ ) conditions and the control ( $M = 1.75$ ,  $SD = 1.45$ ,  $p < .001$ ),  $F(2, 1432) = 946.60$ ,  $p < .001$ . Likewise, for testimonial quality questions, the testimonial condition ( $M = 6.31$ ,  $SD = 0.76$ ) markedly outscored both the demonstrative ( $M = 3.73$ ,  $SD = 1.61$ ,

$p < .001$ ) and control ( $M = 1.99$ ,  $SD = 1.52$ ,  $p < .001$ ) conditions, confirming the intended effect of the manipulation,  $F(2, 1432) = 1157.00$ ,  $p < .001$ .

Figure 1

Results of Manipulation Checks by Evidence Type



Note. Red bars represent the control condition, green bars represent the demonstrative evidence condition, and blue bars represent the testimonial evidence condition. Panels (a)

and (b) display manipulation check results based on tally questions, while panels (c) and (d) show manipulation check results based on evidence quality ratings.

#### Author attribution

Author attribution was checked by asking, “According to the article you just read, who is listed as the author?” with two response options, “James Preston (Human)” or “ChatGPT (AI).” Overall, 88.2% (n = 515) of participants in the AI condition correctly identified the author as ChatGPT, and 97.2% (n = 827) in the human condition correctly identified the author as James Preston.

Taken together, the results from both the evidence presentation and author attribution checks confirmed that the manipulations operated as intended. The distinct differences among demonstrative, testimonial, and control conditions, along with the accurate identification of AI or human authorship, indicate that the experimental stimuli successfully captured the two factors under investigation.

## Chapter 4: Results

### The persuasion effects of evidence type

The first set of hypotheses (H1 and H2) examined whether exposure to persuasive messages about climate change, using either demonstrative or testimonial evidence, would result in higher message acceptance (H1) and policy support (H2) compared to a control condition. Participants in the control group read an unrelated article about the 2024 Nobel Prize winners. A linear regression analysis was conducted, employing a dummy-coded independent variable (0 = control condition, 1 = persuasive conditions combining demonstrative and testimonial evidence). The results indicated that participants exposed to persuasive messages reported significantly higher message acceptance compared to the control group,  $b = 0.81$ ,  $SE = 0.10$ ,  $t(1433) = 7.98$ ,  $p < .001$ , supporting H1. However, no significant difference was found in policy support between the control and persuasive message conditions,  $b = 0.11$ ,  $SE = 0.12$ ,  $t(1433) = 0.85$ ,  $p = .39$ . Thus, H2 was not supported.

The subsequent hypotheses (H3 and H4) directly compared the effectiveness of demonstrative versus testimonial evidence on persuasion outcomes. Specifically, H3 posited that demonstrative evidence would result in greater message acceptance, while H4 proposed greater policy support when compared to testimonial evidence. To test these hypotheses, the control condition was excluded, and a linear regression was conducted using a dummy-coded variable for evidence type (0 = testimonial evidence, 1 = demonstrative evidence). Positive coefficients indicated that demonstrative evidence was more effective at inducing the outcome variable compared to testimonial evidence, whereas negative coefficients indicated the opposite. The results showed demonstrative evidence significantly increased message acceptance relative to testimonial evidence,  $b =$

0.20,  $SE = 0.09$ ,  $t(1160) = 2.33$ ,  $p = .02$ , thus supporting H3 (see the first column of Table 5). Conversely, no significant difference was found in policy support between evidence types,  $b = 0.09$ ,  $SE = 0.11$ ,  $t(1160) = 0.87$ ,  $p = .38$ , providing no support for H4 (see the third column of Table 5).

Table 5

Effects of Evidence Type on Persuasion Outcomes

	Message Acceptance		Policy Support	
	(1)	(2)	(3)	(4)
Evidence Type (Testimonial = 0, Demonstrative = 1)	0.20* (0.09)	0.15* (0.06)	0.09 (0.11)	0.02 (0.07)
Trust in Scientists		0.86*** (0.04)		1.13*** (0.04)
Evidence Type × Trust in Scientists		-0.14** (0.05)		-0.06 (0.06)
Adj. R <sup>2</sup>	0.004	0.443	-0.000	0.56

Conditional Effects of Evidence Type

Trust in Scientists: Low	0.31*** (0.09)
Trust in Scientists: Mean	0.15* (0.06)
Trust in Scientists: High	-0.02 (0.09)

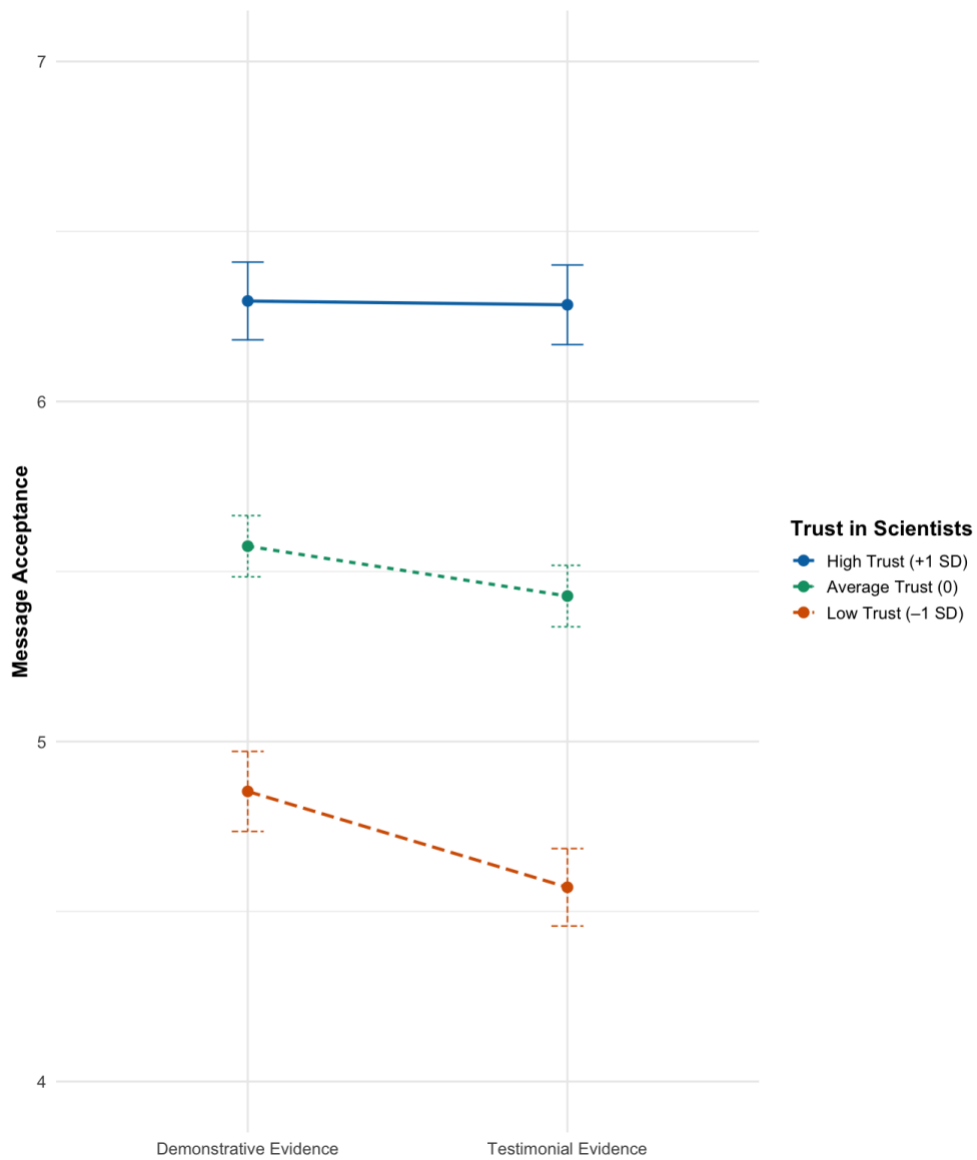
Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$  Evidence type was coded as 0 = testimonial evidence and 1 = demonstrative evidence. Entries are unstandardized regression coefficients. Standard errors appear in parentheses. Low = 1 standard deviation below the mean. High = 1 standard deviation above the mean.

Next, H5 examined whether trust in scientists moderated the effect of evidence type on message acceptance (H5a) and policy support (H5b). H5 predicted that demonstrative evidence would be more persuasive among individuals with lower trust in scientists. The results revealed a significant interaction between evidence type and trust in scientists on message acceptance,  $b = -0.14$ ,  $SE = 0.05$ ,  $t(1158) = -2.59$ ,  $p = .01$ , which supported H5a (see the second column of Table 5).

A simple slopes analysis was conducted to investigate this interaction further. As shown in Figure 2, at low levels of trust (one standard deviation below the mean), demonstrative evidence significantly increased message acceptance compared to testimonial evidence,  $b = 0.31$ ,  $SE = 0.09$ ,  $t = 3.42$ ,  $p < .001$ . At the mean level of trust, the effect remained significant but smaller,  $b = 0.15$ ,  $SE = 0.06$ ,  $t = 2.26$ ,  $p = .020$ . However, at high levels of trust (1 SD above the mean), the effect of demonstrative evidence on message acceptance was not significant,  $b = -0.02$ ,  $SE = 0.09$ ,  $t = -0.24$ ,  $p = .810$ . These findings suggest that demonstrative evidence led to greater acceptance among individuals with low or average trust in scientists, but its persuasive advantage diminished at higher levels of trust. In contrast, the interaction between evidence types and trust in scientists on policy support was not significant,  $b = -0.06$ ,  $SE = 0.06$ ,  $t(1158) = -1.06$ ,  $p = .288$ . Therefore, these findings provide partial support for H5 because H5a was confirmed while H5b was not (see the fourth column of Table 5).

Figure 2

Effect of Evidence Type on Message Acceptance Across Levels of Trust in Scientists



Note. Lines represent message acceptance. The solid blue line represents individuals with high trust in scientists (+1 SD), for whom message acceptance did not significantly differ by evidence type. In contrast, the dashed green line (average trust, 0 SD) and dotted orange line (low trust, -1 SD) show significant differences in message acceptance between demonstrative and testimonial evidence conditions.

The persuasion effects of author attribution (AI versus human authors)

Moving on from the effects of evidence type, RQ1 examined the direct effects of author attribution (AI versus Human) on persuasion outcomes, specifically message acceptance (RQ1a) and policy support (RQ1b). Simple regression results showed that, compared to the human-attributed article, the AI-attributed article did not significantly predict message acceptance,  $b = -0.11$ ,  $SE = 0.09$ ,  $t(1160) = -1.29$ ,  $p = .20$ . Similarly, there was no significant effect of author attribution on policy support,  $b = -0.01$ ,  $SE = 0.11$ ,  $t(1160) = -0.13$ ,  $p = .89$ . These findings suggest that, whether a message was attributed to AI or to a human did not significantly affect either persuasion outcome.

H6 proposed that the effect of author attribution (AI versus human) on persuasion outcomes would be moderated by machine heuristic. This hypothesis examined whether the interaction influenced message acceptance (H6a) and policy support (H6b). Two linear regression models were conducted, each including an interaction term between author attribution and machine heuristic (see Table 6).

Table 6

Effects of Author Attribution on Persuasive Outcomes

	Message Acceptance		Policy Support	
	(1)	(2)	(3)	(4)
Author Attribution (Human = 0, AI = 1)	-0.11 (0.09)	-0.11 (0.06)	-0.01 (0.11)	-0.01 (0.11)
Machine Heuristic		-0.05 (0.04)		-0.12* (0.05)
Evidence Type × Trust in Scientists		0.11† (0.06)		0.23** (0.07)
Adj. R <sup>2</sup>	0.001	0.002	-0.001	0.005

---

Conditional Effects of Author attribution		
Machine Heuristic: Low	-0.28* (0.12)	-0.34* (0.15)
Machine Heuristic: Mean	-0.11 (0.09)	-0.01 (0.11)
Machine Heuristic: High	0.05 (0.12)	0.32* (0.15)

---

Note. †  $p < .10$ . \* $p < .05$ , \*\*\* $p < .001$ . Author attribution was coded as 0 = Human and 1 = AI. Entries are unstandardized regression coefficients. Standard errors appear in parentheses. Low = 1 standard deviation below the mean. High = 1 standard deviation above the mean.

For message acceptance, the interaction between author attribution and machine heuristic was marginally significant,  $b = 0.11$ ,  $SE = 0.06$ ,  $t(1158) = 1.87$ ,  $p = .06$ , which did not meet the conventional .05 threshold but aligned with the hypothesis at the .10 level. A simple slopes analysis showed that among individuals low in machine heuristic (one standard deviation below the mean), AI-authored messages led to significantly lower acceptance compared to human-authored messages,  $b = -0.28$ ,  $SE = 0.12$ ,  $t = -2.24$ ,  $p = .03$ . At the mean level of machine heuristic, the difference was not significant,  $b = -0.11$ ,  $SE = 0.09$ ,  $t = -1.30$ ,  $p = .20$ , and at high machine heuristic (one standard deviation above the mean),  $b = 0.05$ ,  $SE = 0.12$ ,  $t = 0.41$ ,  $p = .68$ ., the difference was also not significant.

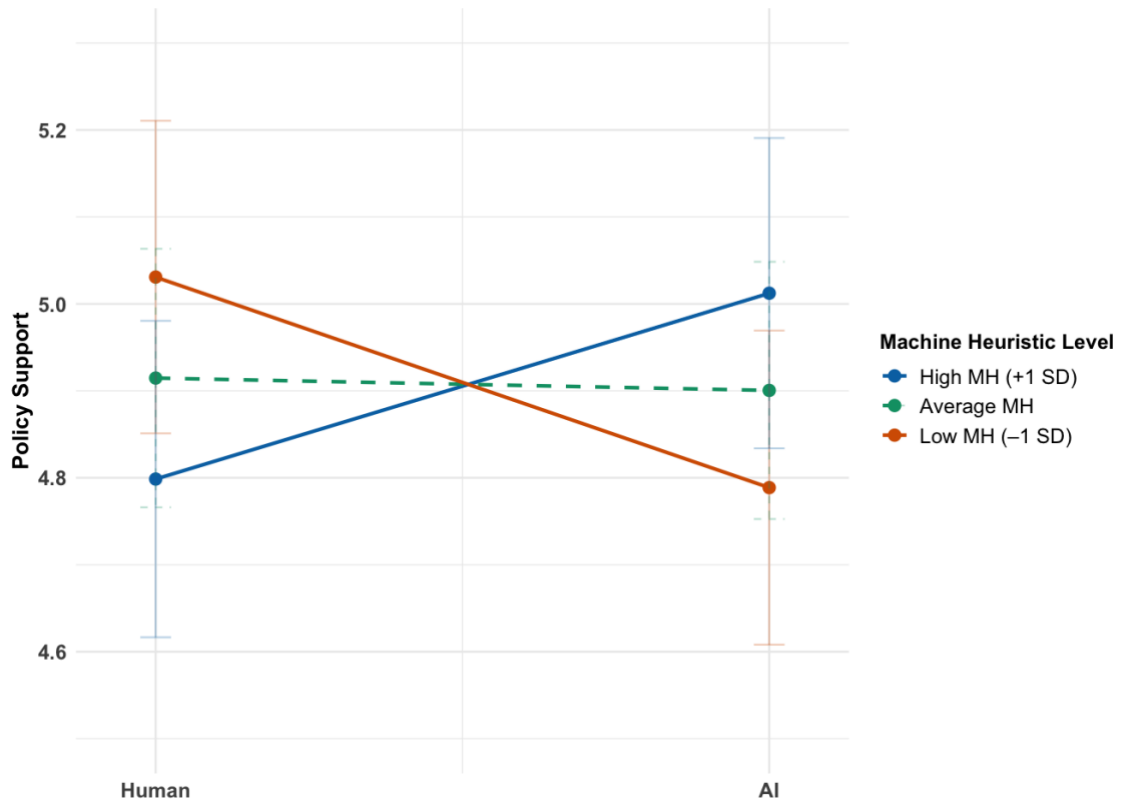
For policy support, the interaction was statistically significant,  $b = 0.23$ ,  $SE = 0.07$ ,  $t(1158) = 3.09$ ,  $p = .002$  (see Figure 3). A simple slope analysis indicated that among individuals low in machine heuristic, AI-authored messages produced

significantly lower policy support than human-authored messages,  $b = -0.34$ ,  $SE = 0.15$ ,  $t = -2.28$ ,  $p = .02$ . On the contrary, among those high in machine heuristic, AI-authored messages led to greater policy support,  $b = 0.32$ ,  $SE = 0.15$ ,  $t = 2.09$ ,  $p = .04$ . At the mean level, the effect was not significant,  $b = -0.01$ ,  $SE = 0.11$ ,  $t = -0.13$ ,  $p = .89$

These findings suggest that AI-attributed articles are more effective among individuals with a favorable view of machines, yet they diminish persuasion among those with lower levels of machine heuristic. Taken together, these results provide partial support for H6. Although the interaction was only marginal for message acceptance (H6a), it followed the expected direction and was significant for policy support (H6b).

Figure 3

Effect of Author Attribution on Policy Support Across Levels of Machine Heuristic



Note. Lines represent predicted values of policy support at three levels of machine heuristic: low ( $-1$  SD), average (0), and high ( $+1$  SD). Error bars indicate 95% confidence intervals. The interaction shows that participants with low MH reported greater support for policies in the human-attributed article than the AI-attributed article. In contrast, those with high MH showed the opposite pattern, greater support for policies in the AI-attributed article.

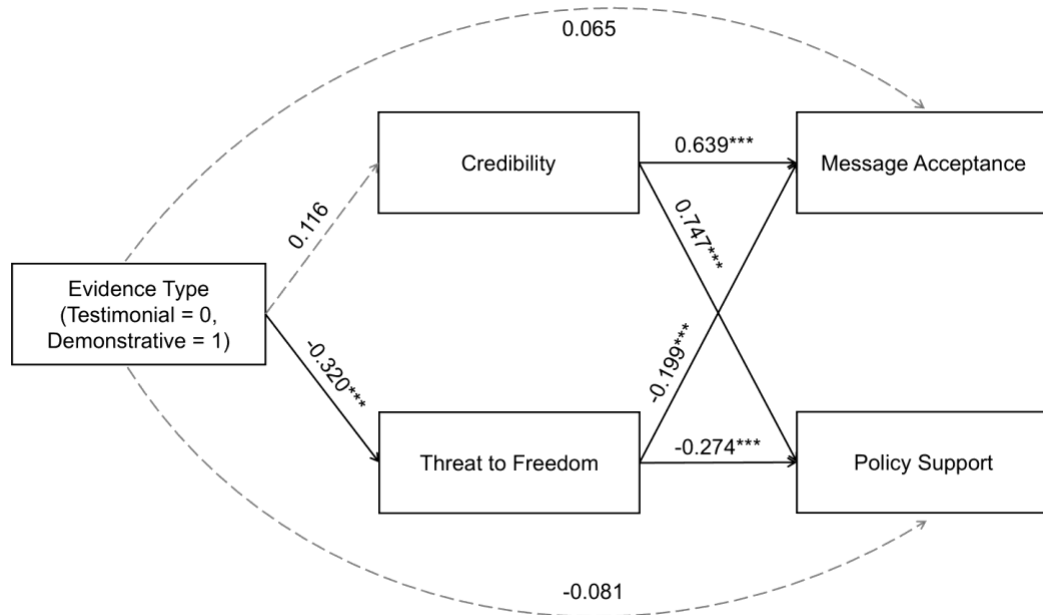
RQ2 explored whether the impact of evidence type (demonstrative vs. testimonial) on persuasion outcomes changes based on whether the message is attributed to AI or a human author. Two linear regression analyses were performed to examine interaction effects for message acceptance (RQ2a) and policy support (RQ2b). For message acceptance, the interaction between evidence types and author attribution was not statistically significant,  $b = -0.19$ ,  $SE = 0.17$ ,  $t(1158) = -1.11$ ,  $p = .27$ . The same pattern emerged for policy support,  $b = -0.19$ ,  $SE = 0.21$ ,  $t(1158) = -0.86$ ,  $p = .388$ . Overall, these findings suggest that the advantage of demonstrative over testimonial evidence does not depend on whether the author is perceived as an AI or a human. The mediation effects of credibility and threat to freedom

To better understand the potential mechanisms underlying the persuasive effects of demonstrative evidence, H7 and H8 tested whether credibility and threat to freedom served as mediators, respectively (see Figure 4), using path analysis. H7 proposed that demonstrative evidence would enhance the credibility of the message, which in turn would increase message acceptance (H7a) and policy support (H7b). Perceived message credibility strongly predicted both outcomes, for message acceptance ( $b = 0.64$ ,  $SE = 0.03$ ,  $p < .001$ ) and policy support ( $b = 0.75$ ,  $SE = 0.03$ ,  $p < .001$ ). Although demonstrative evidence showed a positive coefficient for increasing credibility relative to

testimonial evidence,  $b = 0.12$ ,  $SE = 0.09$ ,  $p = .20$ , this difference did not reach significance. As a result, the indirect effects of evidence type on message acceptance through credibility were not significant,  $b = 0.07$ ,  $SE = 0.06$ , 95% CI = [-0.04, 0.19], and the same was true for policy support,  $b = 0.09$ ,  $SE = 0.07$ , 95% CI = [-0.04, 0.22]. Therefore, H7a and H7b were not supported.

Figure 4

Mediation Model of the Effects of Evidence Type (Demonstrative vs. Testimonial)



Note. \*\*\*  $p < .001$ . Evidence type was coded as 0 = testimonial evidence and 1 = demonstrative evidence. Solid lines indicate significant direct paths and dashed lines indicate nonsignificant paths. The model fit was perfect ( $\chi^2(0) = 0.00$ , RMSEA = 0.000, SRMR = 0.000, CFI = 1.00), indicating full saturation.

In contrast, H8 proposed that demonstrative evidence would lower perceived threat to freedom, which would, in turn, increase message acceptance (H8a) and policy support (H8b). The result revealed that demonstrative evidence significantly reduced

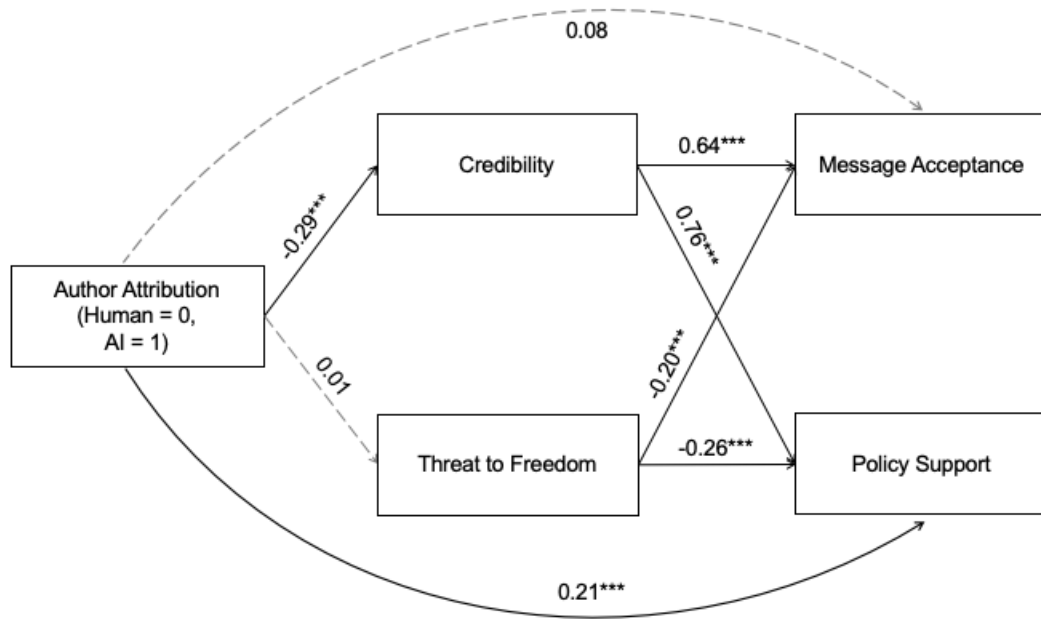
threat to freedom compared to testimonial evidence,  $b = -0.32$ ,  $SE = 0.09$ ,  $p = .001$ .

Threat to freedom was also a significant predictor of message acceptance,  $b = -0.20$ ,  $SE = 0.02$ ,  $p < .001$  and policy support,  $b = -0.27$ ,  $SE = 0.03$ ,  $p < .001$ . Accordingly, the indirect effect of demonstrative evidence relative to testimonial evidence, through threat to freedom was significant for message acceptance,  $b = 0.06$ ,  $SE = 0.02$ , 95% CI = [0.03, 0.10], as well as policy support,  $b = 0.09$ ,  $SE = 0.03$ , 95% CI = [0.04, 0.14], while the direct effect was not significant, indicating full mediation. These findings support H8a and H8b.

Similarly, the final set of research questions considered the potential mediating roles of credibility (RQ3) and threat to freedom (RQ4) in the relationship between author attribution and persuasion outcomes. Specifically, this section examines whether the author attribution (AI vs. human) influences message acceptance and policy support indirectly through changes in perceived credibility and perceived threat to freedom. A path analysis was conducted to address these research questions, as illustrated in Figure 5.

Figure 5

Mediation Model of the Effects of Author Attribution (AI vs. Human)



Note. \*\*\*  $p < .001$ . Author attribution was coded as 0 = Human and 1 = AI. Solid lines indicate significant paths, and dashed lines indicate nonsignificant paths. The model demonstrated full saturation with a perfect fit ( $\chi^2(0) = 0.00$ , RMSEA = 0.000, SRMR = 0.000, CFI = 1.00).

RQ3 investigated whether credibility mediated the relationship between author attribution and two persuasion outcomes, message acceptance (RQ3a) and policy support (RQ3b). The results revealed that the indirect effects of author attribution on both outcomes through credibility were statistically significant for message acceptance ( $b = -0.19$ ,  $SE = 0.06$ , 95% CI [-0.30, -0.08]), and policy support ( $b = -0.22$ ,  $SE = 0.07$ , 95% CI [-0.36, -0.08]). In particular, compared to the human article, the AI article led to lower perceived credibility of the information,  $b = -0.29$ ,  $SE = 0.09$ ,  $p < .01$ . Subsequently, lower perceived credibility in turn predicted reduced message acceptance and policy support. These findings indicate that credibility is an important mediator of the relationship between author attribution and these persuasion outcomes.

RQ4 assessed whether threat to freedom mediated the effect of author attribution on message acceptance (RQ4a) and policy support (RQ4b). Although threat to freedom was a significant negative predictor of both message acceptance,  $b = -0.20$ ,  $SE = 0.02$ ,  $p < .001$ ) and policy support ( $b = -0.26$ ,  $SE = 0.03$ ,  $p < .001$ ), author attribution did not significantly alter perceived threat to freedom ( $b = 0.01$ ,  $SE = 0.09$ ,  $p = .94$ ). Consequently, the standardized indirect effects through threat to freedom were not significant for message acceptance,  $b = -0.00$ ,  $SE = 0.02$ , 95% CI = [-0.04, 0.04], or policy support,  $b = -0.00$ ,  $SE = 0.03$ , 95% CI = [-0.05, 0.05]. These results imply that threat to freedom does not serve as a mediator of the link between author attribution and persuasion outcomes.

Table 7

Summary of Results

Persuasion vs. Non-persuasion message	Hypothesis 1: Exposure to persuasive messages (either demonstrative or testimonial evidence) will increase message acceptance compared to the non-persuasive (control) condition.	H1: Supported
	Hypothesis 2: Exposure to persuasive messages (either demonstrative or testimonial evidence) will increase policy support compared to the non-persuasive (control) condition.	H2: Not supported
Demonstrative vs. Testimonial evidence	Hypothesis 3: Demonstrative evidence will lead to greater message acceptance compared to testimonial evidence.	H3: Supported
	Hypothesis 4: Demonstrative evidence will lead to greater policy support compared to testimonial evidence.	H4: Not supported
	Hypothesis 5: Trust in scientists will moderate the effect of evidence type on (a) message acceptance and (b) policy support, such that	H5a: Supported H5b: Not supported

	demonstrative evidence (compared to testimonial) will be more effective among individuals with lower trust in scientists.	
AI- vs. Human- attributed	Research Question 1: Does author attribution (AI vs. human) influence (a) message acceptance and (b) policy support?	No significant effects
	Research Question 2: Does the effect of evidence type (demonstrative vs. testimonial) on (a) message acceptance and (b) policy support differ depending on author attribution (AI vs. human)?	No significant effects
	Hypothesis 6: Machine heuristic will moderate the effect of author attribution (AI vs. human) on (a) message acceptance and (b) policy support, such that AI-authored messages will be more effective among individuals with higher levels of machine heuristic.	H6a: Supported (marginally significant) H6b: Supported
Mediation	Hypothesis 7: The effect of demonstrative (vs. testimonial) evidence on (a) message acceptance and (b) policy support will be mediated by increased credibility.	H7a: Not supported H7b: Not supported
	Hypothesis 8: The effect of demonstrative (vs. testimonial) evidence on (a) message acceptance and (b) policy support will be mediated by reduced threat to freedom.	H8a: Supported H8b: Supported
	Research Question 3: Does credibility mediate the effect of author attribution (AI vs. human) on (a) message acceptance and (b) policy support?	No significant effects
	Research Question 4: Does threat to freedom mediate the effect of author attribution (AI vs. human) on (a) message acceptance and (b) policy support?	No significant effects

## Chapter 5: Discussions

This study primarily examined two questions: (1) the effectiveness of two scientific information–based persuasion strategies (demonstrative vs. testimonial evidence), and (2) the persuasive impact of information attributed to AI versus a human author.

### Findings and theoretical contributions

The findings indicate that both demonstrative and testimonial evidence effectively persuade audiences compared to non-persuasive messages. Specifically, as confirmed in H1, participants who read a news article describing expected climate change outcomes in the Miami area, either through demonstrative or testimonial evidence, showed significantly greater acceptance of the message than those who read a control article about a Nobel Prize unrelated to climate change. Here, message acceptance was measured by participants' agreement with the climate change outcomes presented in the article. These results support the idea that carefully designed persuasive messages retain substantial influence in shaping audience perceptions. Additionally, these findings echo recent research that questions the existence of backfire effects when individuals encounter counter-attitudinal information or correction information (Wood & Porter, 2019).

While motivated reasoning and identity-based biases may occasionally limit the effectiveness of persuasive efforts, the findings of this study indicate that persuasive communication remains impactful. Recent research has begun to question the dominant assumption that motivated reasoning consistently undermines persuasion (Coppock, 2023; Druckman & McGrath, 2019; Guess & Coppock, 2020). For example, Coppock

(2023) provided empirical evidence suggesting that the effects of motivated reasoning might be overstated by demonstrating that individuals often evaluate persuasive messages independently of their pre-existing beliefs, rather than exclusively reasoning in ways aligned with their identities. Practically, these findings underscore the value of delivering persuasive communications despite potential resistance, as effective persuasive messages generally yield more favorable outcomes compared to no persuasive attempts.

Turning to the comparison between demonstrative and testimonial evidence, the present finding shows that demonstrative evidence is generally more effective, as supported by H3. Although both methods outperformed the non-persuasive control article, demonstrative evidence generated stronger persuasion overall. This finding provides valuable insights into effective science communication strategies, addressing a longstanding question in science communication research. Traditionally, scientific consensus messages have been viewed as the most effective method for communicating scientific information. However, the present study proposes a potentially more suitable and effective persuasive strategy, demonstrative evidence, as an advancement of consensus messaging. Aligning with recent research, Kim and Liu (2024) compared causal evidence to consensus messages regarding beliefs about anthropogenic climate change and found that causal evidence, conceptually similar to the demonstrative evidence utilized in this study, was slightly more effective in strengthening these beliefs.

Moreover, the persuasive effect of demonstrative evidence was particularly pronounced among individuals with lower trust in scientists. Typically, people who hold low trust toward scientific experts are perceived as resistant to persuasion, either due to strong motivated reasoning or skepticism toward sources perceived as having low

credibility. Consequently, such individuals are often viewed as resistant or even unreachable through traditional persuasive strategies, despite being the very group most in need of effective communication. However, simple slope analyses revealed that demonstrative evidence significantly increased persuasion compared to testimonial evidence, especially among participants with low levels of trust. This persuasive advantage persisted at average trust levels but diminished and became non-significant at high trust levels (see Figure 2). These findings indicate that demonstrative evidence may be particularly effective in persuading skeptical audiences who tend to dismiss conventional expert-driven or consensus-based messages. Furthermore, these results strongly highlight a critical insight into effective science communication: the strategy of “Trust us, we are experts,” as exemplified by consensus-based messages, may resonate primarily with individuals who already trust scientists. Given that rejection of scientific findings often originates from a vocal minority who deeply distrust experts, demonstrative evidence, with its detailed explanation of scientific processes and methodologies, could serve as a particularly valuable approach for engaging this skeptical segment of the audience and encouraging acceptance of scientific facts.

The moderation effect of trust in scientists on the persuasive effectiveness of demonstrative evidence found in the current study somewhat contrasts with Kim and Liu’s (2024) findings. They demonstrated that individuals with no trust in climate scientists were more persuaded by consensus messages than by causal messages, which primarily explained the scientific reasoning behind attributing climate change to human activities. Several reasons might explain this discrepancy. First, although the causal message from Kim and Liu (2024) shares conceptual similarities with demonstrative

evidence, the actual manipulations differ notably. Specifically, the demonstrative evidence used in the current study includes explicit methodological detail, clearly describing measurement instruments, scientific procedures, and analytical processes directly tied to outcomes. In contrast, their causal message focuses mainly on explaining the logic behind the attribution of climate change to human actions, without detailing data collection or analysis methods. Thus, while conceptually related, the greater methodological depth and practical specificity in demonstrative evidence may explain the differing moderation results between the two studies.

Second, differences in the measurement of trust in scientists between the two studies may also account for the inconsistent results. Kim and Liu (2024) assessed trust in scientists using a single item: “How much, if at all, do you trust climate scientists to give full and accurate information about global climate change?” measured on a four-point scale. This approach primarily addresses the competence dimension of trust, capturing perceptions related to scientists' expertise and accuracy of information. However, trust in scientists is a multidimensional construct encompassing not only competence but also integrity, benevolence, and openness (Besley et al., 2021; Besley & Tiffany, 2023). In contrast, the current study employed a more comprehensive measure of trust that explicitly incorporated all four dimensions. Specifically, the measurement considered participants' beliefs regarding scientists' expertise and knowledge (competence), honesty and morality (integrity), concern for societal welfare (benevolence), and openness to feedback and transparency in communication (openness). Thus, the broader and more nuanced assessment of trust in the current study might have contributed to the observed differences in moderation effects between the two studies.

In addition to message acceptance, this study examined support for climate change policies as another outcome of interest. The results revealed no significant differences in policy support between persuasive messages and the non-persuasive control condition, nor between demonstrative and testimonial evidence conditions. This finding aligns with previous research indicating limited direct effects of persuasive messages on climate policy support (Bayes et al., 2020; Bolsen & Druckman, 2018; van der Linden et al., 2019). One likely explanation is that the articles did not explicitly articulate how specific policies could effectively mitigate the risks described in the climate change scenario. As a result, policy support in this context likely represents a spillover effect rather than a direct persuasive outcome, given that detailed policy implications were absent from the messages. Conversely, message acceptance was directly related to the explicit content provided within the climate change articles. Additionally, while accepting scientific facts about climate change may positively influence policy support, endorsing specific policies typically involves a deeper commitment, potentially requiring individuals to accept perceived personal costs or substantial shifts in social and political perspectives. This complexity likely makes policy support inherently more resistant to change.

To further investigate the mechanisms underlying persuasive communication, this study examined the potential mediating roles of perceived message credibility and perceived threat to freedom. Specifically, two mediation models were tested. The first model explored whether evidence type (demonstrative vs. testimonial) influenced message acceptance and policy support through perceived credibility and perceived threat to freedom. The second model examined the same mediators in relation to author

attribution (AI vs. human). Both models indicated that higher perceived credibility and lower perceived threats to freedom were associated with stronger persuasive outcomes, although these mediators operated differently depending on the manipulated condition. These findings align with well-established persuasion principles, suggesting that credible messages that avoid restricting audience autonomy are more likely to achieve desired persuasive outcomes.

In the evidence-type model (Figure 2), demonstrative evidence was more persuasive primarily because it reduced perceived threats to freedom, with no significant mediation observed via credibility. Although the credibility rating for demonstrative evidence ( $M = 5.27$ ,  $SD = 1.40$ ) was higher than that for testimonial evidence ( $M = 5.15$ ,  $SD = 1.58$ ), this difference was not statistically significant. These findings suggest that the persuasive advantage of demonstrative evidence arises mainly from its effectiveness in minimizing individuals' perceptions of autonomy restriction rather than from enhancing message credibility. However, this does not imply that testimonial evidence inherently induces strong psychological reactance. Instead, demonstrative evidence appears better suited to preventing reactance during information processing compared to testimonial evidence.

In practical terms, this indicates that demonstrative evidence is persuasive not because individuals necessarily view it as more credible, but because it refrains from explicitly directing individuals on what they should believe. Demonstrative evidence provides detailed data and methodological transparency, enabling individuals to independently understand why experts reach certain conclusions, rather than compelling them simply to trust expert consensus. This perspective aligns with ongoing debates

regarding whether emphasizing scientific consensus, a defining feature of testimonial evidence, may inadvertently provoke reactance (Ma et al., 2019; Rode et al., 2023).

Ultimately, the key insight is that demonstrative evidence's persuasive advantage arises significantly from its capacity to suppress perceived threats to freedom, underscoring the value of transparency and detailed methodological information over solely emphasizing scientific consensus.

Next, the same mediation pathway was explored in the context of author attribution (AI vs. human), another primary focus of this study. Interestingly, unlike evidence type persuasion, author attribution was mediated primarily through perceived credibility rather than perceived threat to freedom. Although higher perceived credibility and lower perceived threat to freedom consistently predicted greater message acceptance and policy support, author attribution affected outcomes exclusively via perceived credibility.

Specifically, AI-authored articles were perceived as less credible, which led to decreased message acceptance and lower policy support. Figure 4 illustrates that perceived credibility fully mediated the relationship between author attribution and message acceptance and partially mediated the relationship with policy support.

Interestingly, the direct path from AI authorship to policy support was positive and significant, while the indirect path via credibility was negative, causing these opposing forces to cancel each other out in the total effect.

Initially, no overall significant difference in message acceptance or policy support was found with linear regression examining the direct effects of author attribution on persuasion outcomes (RQ1). Although mean comparisons indicated slightly higher scores

for human-authored articles (message acceptance:  $M = 5.56$ ,  $SD = 1.45$ ; policy support:  $M = 4.92$ ,  $SD = 1.77$ ) compared to AI-authored articles (message acceptance:  $M = 5.44$ ,  $SD = 1.52$ ; policy support:  $M = 4.90$ ,  $SD = 1.88$ ), these differences were not statistically significant. Therefore, the mediation analysis provides valuable context for understanding the nuanced differences in persuasiveness between human-authored and AI-authored messages, highlighting the importance of indirect effects that are not immediately apparent in simple direct-effect analyses.

When machine heuristic was included as a moderator in these direct-effect analyses (H6), a clearer pattern emerged. AI authorship showed a marginally significant effect on message acceptance ( $p = .06$ ) and a significant effect on policy support ( $p = .002$ ). Individuals who strongly endorsed the machine heuristic (high belief in AI competence) demonstrated less bias against AI-authored messages, while those skeptical of AI were significantly less persuaded by AI-authored messages. Because the content remained identical across authorship conditions, these moderation results underscore the critical role prior attitudes toward AI play in shaping the persuasive impact of AI-authored content.

#### Limitations and future directions

This study acknowledges several limitations. First, regarding the scope of the research topic, the current investigation specifically focused on climate change, emphasizing the particular context of its impacts in the Miami area. However, beyond the issue of climate change, numerous other topics within science and political communication exist in which evidence transparency, particularly demonstrative evidence, can be effectively utilized. Demonstrative evidence is likely to hold persuasive

advantages, especially for topics that are highly controversial or polarized, or where public skepticism toward experts or institutions significantly influences message acceptance. Theoretically, the persuasive advantages of demonstrative evidence over testimonial evidence have relevance across diverse contexts. Such contexts include health communication related to vaccine safety and public resistance, legal communication addressing voter fraud claims, and historical communication regarding controversies such as the role of slavery in the American Civil War. Therefore, future research should extend the application of demonstrative evidence to a broader range of topics and contexts to further clarify and explore the persuasive potential of evidence transparency.

Second, regarding the study sample, the current research would have benefited from intentional, targeted recruitment of participants explicitly skeptical or resistant toward climate change science. Although the present study collected data from a broadly representative sample of the general American public, this general sampling approach limited the ability to capture detailed insights regarding how demonstrative and testimonial evidence specifically affect audiences who hold deeply entrenched opposing views. A more targeted recruitment strategy, intentionally selecting individuals resistant or skeptical toward climate change, would provide greater precision in assessing the effectiveness of different types of evidence presentation. Additionally, this approach would offer more detailed explanations about the moderating roles of relevant variables such as trust in experts, perceived source credibility, and perceived threats to freedom. Thus, future research, after fully establishing the theoretical underpinnings of evidence transparency, would adopt more targeted sampling strategies to provide deeper insights into persuasion among skeptical or resistant audience segments.

Third, the experimental stimuli in this study did not directly and thoroughly articulate relevant policy solutions. This omission is presumed to be a contributing factor to the persuasive effects observed primarily in message acceptance rather than policy support. Compared to general message acceptance, policy support involves greater personal and social commitment, resources, and direct action; thus, persuasive messages aimed at policy support need to explicitly illustrate how specific policies effectively address identified problems. For example, in the context of climate change messaging explored in this study, clearly describing how proposed policies can mitigate frequent flooding risks in areas like Miami Beach would strengthen persuasive outcomes related to policy endorsement. Consequently, future studies would benefit from incorporating comprehensive policy-related information into experimental stimuli, explicitly linking problem identification to effective policy solutions to enhance persuasive outcomes related to policy support.

Fourth, regarding the comparison between AI-attributed and human-attributed articles, the widespread adoption of generative AI by the general public raises concerns about the ecological validity of the current study's approach. Specifically, this study used pre-generated, static AI-produced messages presented to participants, a design choice that may differ substantially from how individuals commonly interact with generative AI in naturalistic settings. Allowing participants to directly engage with and obtain information from interactive generative AI systems would provide a more realistic and externally valid testing environment. Such interactive scenarios would likely offer richer insights into public perceptions of AI-generated content compared to human-generated content. Therefore, future research should adopt experimental designs enabling direct participant

interaction with generative AI tools, thereby strengthening the ecological validity and generalizability of findings. Thus, future research might consider employing experimental designs that involve direct interactions between participants and generative AI, thereby enhancing the ecological validity and generalizability of findings.

Despite these limitations, this study substantially contributes to revitalizing previously stagnant theoretical discussions surrounding argument quality within persuasive communication research. It further proposes evidence transparency as a clearly operationalizable and measurable criterion of argument quality, addressing an overlooked dimension within this theoretical domain. Additionally, through mediation analysis, this research identifies potential underlying mechanisms that explain how persuasive processes operate with regard to evidence transparency and author attribution. These findings collectively offer valuable theoretical and practical insights for future persuasive communication scholarship.

## Conclusion

This study aimed to address two primary questions: (1) identifying the relative effectiveness of demonstrative versus testimonial evidence as scientific information-based persuasion strategies, and (2) exploring the persuasive implications of attributing messages to AI compared to human authors. Through experimental analysis, this research demonstrated that both demonstrative and testimonial evidence effectively enhanced message acceptance compared to non-persuasive control messages. However, demonstrative evidence was particularly effective, largely because it minimized perceived threats to freedom, especially among individuals skeptical of scientific expertise. Conversely, AI-authored messages were generally perceived as less credible,

leading to lower persuasive outcomes, though this effect was moderated significantly by individuals' prior beliefs about AI competence.

Theoretically, these findings contribute to ongoing discussions about the critical role of message characteristics, particularly evidence transparency, in effective science communication. Practically, the study emphasizes that persuasive strategies based on detailed methodological transparency (demonstrative evidence) can be more effective than those relying solely on scientific consensus, especially for audiences skeptical of scientific authority. Additionally, the results highlight the importance of credibility perceptions in evaluating AI-generated messages, underscoring how pre-existing attitudes toward AI technologies critically shape their persuasive impact.


Connecting these findings back to broader communication challenges, the study underscores that resistance to scientific messages often arises not solely from insufficient knowledge but significantly from how the information is communicated. Traditional consensus-based appeals, such as "trust us, we are experts," can alienate skeptical audiences by triggering reactance and resistance. Instead, this research advocates for greater methodological transparency and clarity about scientific processes, enabling individuals to independently evaluate scientific claims rather than feeling coerced into accepting expert conclusions.

Ultimately, addressing public skepticism toward science, particularly in contexts polarized by identity and prior beliefs, requires nuanced communication strategies that respect audience autonomy and prioritize transparency. By better understanding the mechanisms underlying persuasion, such as perceived threats to freedom and credibility,

communicators can design more effective messages that foster acceptance of crucial scientific information, thereby enhancing informed public dialogue and decision-making.

## Appendix A: Stimuli

### 1. Main study stimuli a. Demonstrative evidence with AI attribution



A person walking a bicycle through floodwaters on a city © Patrick G. Willson

### Miami Beach's Future at Risk: How Rising Seas Could Make the City Uninhabitable

By ChatGPT

ChatGPT, a Generative AI, is a type of artificial intelligence designed to create new content by analyzing patterns it has learned from vast datasets.

Jan 15, 2025, 2:00 AM ET

By the end of the century, near-daily flooding could render parts of Miami Beach uninhabitable, severely threatening the city's homes, businesses, and infrastructure. ChatGPT addresses this issue through the four key questions below, explaining how these impacts are observed, measured, and predicted.

- Why is climate change raising sea levels?
- How do scientists measure sea levels?
- How do scientists forecast the future of rising seas?
- What does science say about Miami's future?

#### 1. Why Is Climate Change Raising Sea Levels?

Sea levels are rising due to two key processes caused by climate change. First, oceans absorb over 90% of the heat trapped by greenhouse gases, causing the water to expand—a process called *thermal expansion*. Second, as global temperatures rise, **ice sheets and glaciers melt** at an accelerated rate, adding massive amounts of water to the oceans. For example, satellites have recorded that Greenland loses approximately 280 gigatons of ice each year, contributing directly to global sea level rise.

These rising seas are already having visible impacts in Miami Beach, most notably during seasonal **King Tides**. **King Tides** are naturally occurring high tides driven by the gravitational alignment of the sun and moon, but with higher baseline sea levels, they now cause more frequent and severe flooding in low-lying neighborhoods. Streets and homes that were previously unaffected during these tides are now regularly inundated, disrupting daily life and showcasing how even small increases in sea level can have significant consequences.

#### 2. How Do Scientists Measure Sea Levels?

Tracking sea level changes involves a combination of advanced tools including **tide gauges**, **satellites like GRACE (Gravity Recovery and Climate Experiment)**, and **Argo floats**. Tide gauges, placed along coastlines, monitor ocean height relative to fixed land points. Meanwhile, satellites like GRACE measure changes in Earth's gravitational field caused by melting ice, offering precise insights into how much water is added to the oceans. Complementing these tools are Argo floats—an array of thousands of ocean sensors that collect real-time data on temperature and salinity, crucial for understanding the role of thermal expansion.

#### 3. How Do Scientists Forecast the Future of Rising Seas?

Using the data collected from these tools, scientists build **climate models**, which are powerful computer programs designed to simulate future conditions. Think of these models as advanced "what-if" machines. They start by collecting real-world data, like how quickly sea levels are rising (about 3 mm per year), Miami Beach's low elevation (just 1 to 3 feet above sea level), and records of past King Tide flooding. This data is then fed into the model, which uses mathematical formulas to mimic how different factors, like warming oceans, or melting ice sheets could push sea levels even higher.

The model runs thousands of virtual experiments to test what might happen under various scenarios. For example, it might calculate what would occur if global temperatures rise by 2 degrees Celsius, causing ice sheets to melt faster and send more water into the oceans. By tweaking different factors in each experiment, the models produce a range of possible outcomes. One prediction from these models is that a 2-foot rise in sea level could flood 60% of Miami Beach, leaving neighborhoods like Alton Road underwater by more than 3 feet.

#### 4. What Does Science Say About Miami's Future?

By the middle of the century, large sections of the city could experience regular flooding, and by the end of the century, flooding could occur almost daily. Seasonal disruptions could escalate into near-constant crises, with some areas experiencing flooding 200 to 300 days a year. Without significant action, rising seas will not only disrupt daily life but could render parts of Miami Beach uninhabitable, threatening the city's homes, businesses, and iconic identity.

## b. Demonstrative evidence with Human attribution

A person walking a bicycle through floodwaters on a city © Patrick G. Willson

### Miami Beach's Future at Risk: How Rising Seas Could Make the City Uninhabitable

**By James Preston**  
Dr. Preston is a climate scientist and journalist with a Ph.D. in environmental studies, specializing in the impacts of climate change on coastal communities.  
Jan 15, 2025, 2:00 AM ET

By the end of the century, near-daily flooding could render parts of Miami Beach uninhabitable, severely threatening the city's homes, businesses, and infrastructure. Dr. Preston explores this issue through the four key questions below, explaining how these impacts are observed, measured, and predicted.

- Why is climate change raising sea levels?
- How do scientists measure sea levels?
- How do scientists forecast the future of rising seas?
- What does science say about Miami's future?

#### 1. Why Is Climate Change Raising Sea Levels?

Sea levels are rising due to two key processes caused by climate change. First, oceans absorb over 90% of the heat trapped by greenhouse gases, causing the water to expand—a process called **thermal expansion**. Second, as global temperatures rise, **ice sheets and glaciers melt** at an accelerated rate, adding massive amounts of water to the oceans. For example, satellites have recorded that Greenland loses approximately 280 gigatons of ice each year, contributing directly to global sea level rise.

These rising seas are already having visible impacts in Miami Beach, most notably during seasonal **King Tides**. **King Tides** are naturally occurring high tides driven by the gravitational alignment of the sun and moon, but with higher baseline sea levels, they now cause more frequent and severe flooding in low-lying neighborhoods. Streets and homes that were previously unaffected during these tides are now regularly inundated, disrupting daily life and showcasing how even small increases in sea level can have significant consequences.

#### 2. How Do Scientists Measure Sea Levels?

Tracking sea level changes involves a combination of advanced tools including **tide gauges**, **satellites like GRACE (Gravity Recovery and Climate Experiment)**, and **Argo floats**. Tide gauges, placed along coastlines, monitor ocean height relative to fixed land points. Meanwhile, satellites like GRACE measure changes in Earth's gravitational field caused by melting ice, offering precise insights into how much water is added to the oceans. Complementing these tools are Argo floats—an array of thousands of ocean sensors that collect real-time data on temperature and salinity, crucial for understanding the role of thermal expansion.

#### 3. How Do Scientists Forecast the Future of Rising Seas?


Using the data collected from these tools, scientists build **climate models**, which are powerful computer programs designed to simulate future conditions. Think of these models as advanced "what-if" machines. They start by collecting real-world data, like how quickly sea levels are rising (about 3 mm per year), Miami Beach's low elevation (just 1 to 3 feet above sea level), and records of past King Tide flooding. This data is then fed into the model, which uses mathematical formulas to mimic how different factors, like warming oceans, or melting ice sheets could push sea levels even higher.

The model runs thousands of virtual experiments to test what might happen under various scenarios. For example, it might calculate what would occur if global temperatures rise by 2 degrees Celsius, causing ice sheets to melt faster and send more water into the oceans. By tweaking different factors in each experiment, the models produce a range of possible outcomes. One prediction from these models is that a 2-foot rise in sea level could flood 60% of Miami Beach, leaving neighborhoods like Alton Road underwater by more than 3 feet.

#### 4. What Does Science Say About Miami's Future?

By the middle of the century, large sections of the city could experience regular flooding, and by the end of the century, flooding could occur almost daily. Seasonal disruptions could escalate into near-constant crises, with some areas experiencing flooding 200 to 300 days a year. Without significant action, rising seas will not only disrupt daily life but could render parts of Miami Beach uninhabitable, threatening the city's homes, businesses, and iconic identity.

### c. Testimonial evidence with AI attribution



A person walking a bicycle through floodwaters on a city © Patrick G. Willson

## Miami Beach's Future at Risk: How Rising Seas Could Make the City Uninhabitable

By ChatGPT  
ChatGPT, a Generative AI, is a type of artificial intelligence designed to create new content by analyzing patterns it has learned from vast datasets.

Jan 15, 2025, 2:00 AM ET

By the end of the century, near-daily flooding could render parts of Miami Beach uninhabitable, severely threatening the city's homes, businesses, and infrastructure. ChatGPT addresses this issue through the four key questions below, emphasizing the consistent findings of experts and leading institutions.

- Which experts and institutions support climate predictions for Miami?
- What makes the IPCC a credible source for climate science?
- Do experts agree on the predictions for rising seas?
- What does science say about Miami's future?

### 1. Which Experts and Institutions Support Climate Predictions for Miami?

The alarming forecasts about Miami's future are supported by some of the world's most trusted scientific institutions, including NASA, the National Oceanic and Atmospheric Administration (NOAA), and the Intergovernmental Panel on Climate Change (IPCC). The IPCC, a globally respected authority on climate science, projects that sea levels could rise by 1 to 2 feet by the end of the century if current greenhouse gas emission trends continue.

Dr. David Miller, a professor of Climate Systems at Columbia University's Earth Institute, states, "The science is unequivocal: without significant emissions reductions, coastal cities like Miami face severe risks." Adding to this, Dr. Laura Bennett, a climate policy expert at the University of California, Berkeley, notes, "The data is crystal clear: sea level rise is accelerating, and the consequences for cities like Miami are stark."

### 2. What Makes the IPCC a Credible Source for Climate Science?

The IPCC (Intergovernmental Panel on Climate Change) is recognized as the most authoritative international body on climate change. Established by the United Nations, it synthesizes peer-reviewed research from thousands of scientists across diverse disciplines. Each of its reports is the result of rigorous collaboration among over 800 experts from prestigious institutions like Harvard University, Stanford University, MIT, and Imperial College London, ensuring the highest level of reliability and credibility.

Dr. Emily Parker, a senior researcher at NOAA's Geophysical Fluid Dynamics Laboratory, and contributor to IPCC reports, explains, "The IPCC's findings are the gold standard in climate science, representing the consensus of the world's leading experts. Their projections are not just data—they are a call to action for governments and communities."

### 3. Do Experts Agree on the Predictions for Rising Seas?


The scientific consensus on sea level rise and its impacts is overwhelming. Experts from around the globe agree that the evidence is undeniable and the risks are severe. Dr. John Williams, a professor at University of Miami's Rosenstiel School of Marine and Atmospheric Science, underscores this agreement: "The level of alignment among experts is unprecedented. While minor specifics may vary, the overarching conclusions about the dangers of sea level rise are indisputable." Dr. Sarah Lopez, a marine geologist at Oxford University, adds, "We've reached a point where the evidence is impossible to ignore. The rising waters are not just a projection—they're a measurable, ongoing phenomenon, and Miami is on the frontlines."

This consensus is further reinforced by leading organizations, including the American Meteorological Society, the Union of Concerned Scientists, and the National Academy of Sciences, all of which have repeatedly affirmed the severe implications of climate change. NASA and NOAA independently confirm findings that align closely with the IPCC's projections, leaving little doubt about the escalating threats posed by rising seas.

### 4. What Does Science Say About Miami's Future?

By the middle of the century, large sections of the city could experience regular flooding, and by the end of the century, flooding could occur almost daily. Seasonal disruptions could escalate into near-constant crises, with some areas experiencing flooding 200 to 300 days a year. Without significant action, rising seas will not only disrupt daily life but could render parts of Miami Beach uninhabitable, threatening the city's homes, businesses, and iconic identity.

## d. Testimonial evidence with Human attribution



A person walking a bicycle through floodwaters on a city © Patrick G. Wilson

### **Miami Beach's Future at Risk: How Rising Seas Could Make the City Uninhabitable**

**By James Preston**  
Dr. Preston is a climate scientist and journalist with a Ph.D. in environmental studies, specializing in the impacts of climate change on coastal communities.

Jan 15, 2025, 2:00 AM ET

By the end of the century, near-daily flooding could render parts of Miami Beach uninhabitable, severely threatening the city's homes, businesses, and infrastructure. **Dr. Preston** explores this issue through the four key questions below, emphasizing the consistent findings of experts and leading institutions.

- Which experts and institutions support climate predictions for Miami?
- What makes the IPCC a credible source for climate science?
- Do experts agree on the predictions for rising seas?
- What does science say about Miami's future?

#### **1. Which Experts and Institutions Support Climate Predictions for Miami?**

The alarming forecasts about Miami's future are supported by some of the world's most trusted scientific institutions, including **NASA**, the **National Oceanic and Atmospheric Administration (NOAA)**, and the **Intergovernmental Panel on Climate Change (IPCC)**. The IPCC, a globally respected authority on climate science, projects that sea levels could rise by 1 to 2 feet by the end of the century if current greenhouse gas emission trends continue.

**Dr. David Miller**, a professor of Climate Systems at Columbia University's Earth Institute, states, "The science is unequivocal: without significant emissions reductions, coastal cities like Miami face severe risks." Adding to this, **Dr. Laura Bennett**, a climate policy expert at the University of California, Berkeley, notes, "The data is crystal clear: sea level rise is accelerating, and the consequences for cities like Miami are stark."

#### **2. What Makes the IPCC a Credible Source for Climate Science?**

The **IPCC (Intergovernmental Panel on Climate Change)** is recognized as the most authoritative international body on climate change. Established by the United Nations, it synthesizes peer-reviewed research from thousands of scientists across diverse disciplines. Each of its reports is the result of rigorous collaboration among over 800 experts from prestigious institutions like **Harvard University**, **Stanford University**, **MIT**, and **Imperial College London**, ensuring the highest level of reliability and credibility.

**Dr. Emily Parker**, a senior researcher at NOAA's Geophysical Fluid Dynamics Laboratory, and contributor to IPCC reports, explains, "The IPCC's findings are the gold standard in climate science, representing the consensus of the world's leading experts. Their projections are not just data—they are a call to action for governments and communities."

#### **3. Do Experts Agree on the Predictions for Rising Seas?**


The scientific consensus on sea level rise and its impacts is overwhelming. Experts from around the globe agree that the evidence is undeniable and the risks are severe. **Dr. John Williams**, a professor at University of Miami's Rosenstiel School of Marine and Atmospheric Science, underscores this agreement: "The level of alignment among experts is unprecedented. While minor specifics may vary, the overarching conclusions about the dangers of sea level rise are indisputable." **Dr. Sarah Lopez**, a marine geologist at Oxford University, adds, "We've reached a point where the evidence is impossible to ignore. The rising waters are not just a projection—they're a measurable, ongoing phenomenon, and Miami is on the frontlines."

This consensus is further reinforced by leading organizations, including the **American Meteorological Society**, the **Union of Concerned Scientists**, and the **National Academy of Sciences**, all of which have repeatedly affirmed the severe implications of climate change. **NASA** and **NOAA** independently confirm findings that align closely with the **IPCC's** projections, leaving little doubt about the escalating threats posed by rising seas.

#### **4. What Does Science Say About Miami's Future?**

By the middle of the century, large sections of the city could experience regular flooding, and by the end of the century, flooding could occur almost daily. Seasonal disruptions could escalate into near-constant crises, with some areas experiencing flooding 200 to 300 days a year. Without significant action, rising seas will not only disrupt daily life but could render parts of Miami Beach uninhabitable, threatening the city's homes, businesses, and iconic identity.

e. Control condition



## The 2024 Nobel Prizes: Stories of Inspiration, Progress, and Peace

**By James Preston**  
Mr. Preston is a seasoned journalist with over a decade of experience covering global culture and humanitarian issues.  
Jan 15, 2025, 2:00 AM ET

The Nobel Prize awardees for 2024 have been announced, recognizing exceptional contributions to humanity in fields such as Physics, Chemistry, and Medicine. Established by Alfred Nobel's will in 1895, the prize is one of the world's most prestigious honors, celebrating those who advance knowledge, improve human welfare, and inspire progress. However, beyond the sciences, the Nobel Prizes also recognize achievements in other significant areas, such as Literature and Peace, which highlight cultural and humanitarian contributions that have a lasting global impact.

Among its various categories, the Nobel Prize in Literature and the Nobel Peace Prize stand out for their emphasis on fostering understanding and promoting global harmony. These awards honor individuals and organizations that shape our collective humanity through their words, actions, and unwavering commitment to a better world.

### 1. Notable Past Laureates

Over the years, the Nobel Prize has celebrated individuals whose work has profoundly shaped society. For instance, Dr. Martin Luther King Jr. was awarded the Nobel Peace Prize in 1964 for his pivotal role in the American civil rights movement, advocating for nonviolence, equality, and justice. Likewise, Toni Morrison received the Nobel Prize in Literature in 1993 for her masterful storytelling, which illuminated the African-American experience by weaving themes of history, identity, and resilience.

These laureates exemplify the essence of the Nobel Prize: to inspire, innovate, and elevate humanity. By recognizing these transformative figures, the awards continue to honor those who excel in their fields while striving for a more equitable, peaceful, and just world.

### 2. Who Won the 2024 Nobel Prize in Literature?

The 2024 Nobel Prize in Literature was awarded to Han Kang, a celebrated South Korean author renowned for her profound exploration of identity, memory, and trauma. Her writing journey began during her childhood, deeply influenced by South Korea's tumultuous history. Han's acclaimed works, such as *The Vegetarian* and *Human Acts*, are known for their lyrical prose and evocative storytelling.

*The Vegetarian* narrates the journey of a woman who decides to stop eating meat, delving into themes of autonomy and resistance to societal norms. The Nobel Committee commended Han Kang for her ability to "illuminate the human condition," highlighting the transformative power of her narratives.

In her acceptance speech, Han reflected on her role as a writer, stating, "Words have the power to heal wounds and bring forth understanding in a fractured world." Her recognition as the first South Korean woman to receive this honor marks a significant milestone in literary history, celebrating both her achievements and the vibrant voices emerging from South Korea that inspire readers worldwide.

### 3. Who Won the 2024 Nobel Peace Prize?

The 2024 Nobel Peace Prize was awarded to Nihon Hidankyo, an organization representing the *hibakusha*—the survivors of the atomic bombings in Hiroshima and Nagasaki. Founded by survivors, Nihon Hidankyo has long been a voice for nuclear disarmament and raising awareness about the devastating human effects of nuclear warfare. By focusing on personal stories, they ensure that the voices of those who endured such catastrophic events are never forgotten.

This year's award acknowledges their tireless advocacy and commitment to preventing the horrors of nuclear war. The Nobel Committee emphasized, "This award recognizes the courage of those who continue to speak out against nuclear weapons, seeking a peaceful future for all."

Nihon Hidankyo's work underscores the importance of dialogue, education, and collective global action in promoting peace and security. Their mission serves as a poignant reminder of the ongoing struggle for a world free from nuclear threats. The organization's continued advocacy calls for policies that prioritize the safety of future generations and protect vulnerable populations from the devastating consequences of nuclear conflict, ensuring a peaceful future.

## 2. Pilot Test 1 Stimuli

### a. Demonstrative evidence with AI attribution

CLIMATE


# The climate crisis isn't coming. It's here – and these heat waves show why we need to act.

Feb 12, 2024 • 9:00 AM ET  
By [ChatGPT](#)

---

**About the Author**  
This article was meticulously crafted by **ChatGPT**, an advanced artificial intelligence developed by OpenAI. ChatGPT creates text based on patterns it has learned from a large dataset, enabling it to produce content on a broad range of topics.

---



During the past summer, tens of millions of Americans found themselves living under extreme heat warnings. Patrick G. Willson / Bloomberg via Getty Images

WASH, DC — Committed to innovation and journalistic excellence, our newsroom is actively exploring the potential of generative artificial intelligence. As part of this pioneering initiative, the article you are reading has been written by **ChatGPT**, a generative AI technology, in response to the prompt we supplied.

In a landmark analysis, the Environmental Protection Agency (EPA) has unveiled findings that illuminate the shifting patterns of heat waves, offering a rigorous insight into the ramifications of climate change on extreme weather events. The study employs a sophisticated methodological approach, bridging the gap between intricate scientific processes and their broader implications for public understanding.

**Decoding Temperature Trends**  
The EPA's approach to understanding climate patterns is akin to piecing together a vast jigsaw puzzle of historical weather data. Just as one might track the changing seasons by noting daily temperature swings, the agency has methodically charted decades of climate data to paint a comprehensive picture of our warming world.

**Data Collection**  
The EPA collected data from weather stations across the 50 largest metropolitan areas in the United States. This data wasn't just about how hot it was; it included details like how long the heatwaves lasted, how intense they were, and even how warm the nights were during these periods. The agency's focus on data going back to 1961 provides a comprehensive look at how heatwaves have evolved over the decades.

**Analytical Methodology**  
The EPA's method for analyzing this data mirrors a jeweler's precision in assessing gem quality. The EPA set specific criteria, defining a heatwave as a period of two or more consecutive days with temperatures in the top 15% for July and August. This method helps to compare apples to apples, ensuring that the heatwaves being analyzed are truly out of the ordinary for their time and place.

**Findings: A Clear and Present Danger**  
The research points to a stark reality: heat waves are increasing in frequency, lasting longer, and becoming more intense. This trend signifies a major shift in climate behavior; what used to be a once-in-a-summer extreme heat day is now becoming a new normal.

**Implications: Confronting Climate Change**  
The EPA's study doesn't exist in a vacuum. It adds another piece of evidence to the growing picture of climate change, showing how more frequent and intense heat waves are a direct consequence of a warming world – a world largely shaped by human actions like excessive burning of fossil fuels.


**It's Time to Act.**  
The EPA's findings are not just a report card on our climate; they are a call to action. The study emphasizes the urgency of addressing the consequences of a warming planet, advocating for policies and initiatives that could build a cooler, sustainable future. If we want to stem the tide of worsening heat waves, we have to get serious about involving the reduction of carbon footprints, sustainable practices, and investments in renewable energy and green infrastructure. This isn't just a job for politicians; each of us needs to be part of finding solutions to protect the world we all live in.

## b. Demonstrative evidence with Human attribution

CLIMATE

### The climate crisis isn't coming. It's here – and these heat waves show why we need to act.

Feb 12, 2024 • 9:00 AM ET  
By [Jonathan Ross](#)



During the past summer, tens of millions of Americans found themselves living under extreme heat warnings or advisories. *Patrick G. Willson / Bloomberg via Getty Images*

WASH, DC — In a landmark analysis, the Environmental Protection Agency (EPA) has unveiled findings that illuminate the shifting patterns of heat waves, offering a rigorous insight into the ramifications of climate change on extreme weather events. The study employs a sophisticated methodological approach, bridging the gap between intricate scientific processes and their broader implications for public understanding.

**Decoding Temperature Trends**  
The EPA's approach to understanding climate patterns is akin to piecing together a vast jigsaw puzzle of historical weather data. Just as one might track the changing seasons by noting daily temperature swings, the agency has methodically charted decades of climate data to paint a comprehensive picture of our warming world.

**Data Collection**  
The EPA collected data from weather stations across the 50 largest metropolitan areas in the United States. This data wasn't just about how hot it was; it included details like how long the heatwaves lasted, how intense they were, and even how warm the nights were during these periods. The agency's focus on data going back to 1961 provides a comprehensive look at how heatwaves have evolved over the decades.

**Analytical Methodology**  
The EPA's method for analyzing this data mirrors a jeweler's precision in assessing gem quality. The EPA set specific criteria, defining a heatwave as a period of two or more consecutive days with temperatures in the top 15% for July and August. This method helps to compare apples to apples, ensuring that the heatwaves being analyzed are truly out of the ordinary for their time and place.

**Findings: A Clear and Present Danger**  
The research points to a stark reality: heat waves are increasing in frequency, lasting longer, and becoming more intense. This trend signifies a major shift in climate behavior; what used to be a once-in-a-summer extreme heat day is now becoming a new normal.

**Implications: Confronting Climate Change**  
The EPA's study doesn't exist in a vacuum. It adds another piece of evidence to the growing picture of climate change, showing how more frequent and intense heat waves are a direct consequence of a warming world – a world largely shaped by human actions like excessive burning of fossil fuels.

**It's Time to Act.**  
The EPA's findings are not just a report card on our climate; they are a call to action. The study emphasizes the urgency of addressing the consequences of a warming planet, advocating for policies and initiatives that could build a cooler, sustainable future. If we want to stem the tide of worsening heat waves, we have to get serious about involving the reduction of carbon footprints, sustainable practices, and investments in renewable energy and green infrastructure. This isn't just a job for politicians; each of us needs to be part of finding solutions to protect the world we all live in.

c. Testimonial evidence with AI attribution

CLIMATE

## The climate crisis isn't coming. It's here – and these heat waves show why we need to act.

Feb 12, 2024 • 9:00 AM ET

By [ChatGPT](#)

### About the Author

This article was meticulously crafted by **ChatGPT**, an advanced artificial intelligence developed by OpenAI. ChatGPT creates text based on patterns it has learned from a large dataset, enabling it to produce content on a broad range of topics.



During the past summer, tens of millions of Americans found themselves living under extreme heat warnings. *Patrick G. Willson / Bloomberg via Getty Images*

WASH, DC — Committed to innovation and journalistic excellence, our newsroom is actively exploring the potential of generative artificial intelligence. As part of this pioneering initiative, the article you are reading has been written by **ChatGPT**, a generative AI technology, in response to the prompt we supplied.

In the face of mounting heatwave incidents across the United States, the scientific community is sounding the alarm about the unmistakable imprint of climate change on these extreme weather patterns. Recent analyses, notably the Environmental Protection Agency's (EPA) Fifth National Climate Assessment, are shedding light on the escalating phenomenon of heatwaves in a warming globe.

According to the EPA, urban centers in the U.S. are experiencing longer heatwaves, now averaging about four days, a significant uptick since the 1960s. Moreover, the heatwave season is extending, now nearly 49 days longer than in previous decades. This troubling trend is symptomatic of a larger crisis, with rising temperatures posing serious risks to the Earth.

Experts like Dr. Emily Sanchez of the National Climate Assessment underscore the direct correlation between rising global temperatures and the intensity of heatwaves, citing human-induced greenhouse gas emissions as a key contributor. Additionally, the World Meteorological Organization (WMO) warns that the frequency and duration of heatwaves are projected to increase further with continued warming. The urban heat island effect further intensifies these heatwaves, particularly in densely populated areas, as highlighted by meteorologist Dr. Aaron Lee. Dr. Susan Patel, specializing in environmental health, points out the severe impact of these temperature extremes on disadvantaged communities, illustrating the intersection of climate change with social and economic issues.

The scientific consensus on this issue is overwhelming. The Intergovernmental Panel on Climate Change (IPCC), a leading world authority, regards heatwaves as a signature of climate change. This view is reinforced by landmark studies published in *Nature Climate Change* and other reputable journals, meticulously linking human actions to rising temperatures and their cascading consequences. "There's irrefutable evidence, spanning from the IPCC to peer-reviewed publications, that our actions are destabilizing the climate," states climate policy analyst Sarah Miller. "Without urgent emissions reductions and adaptation strategies, heatwaves will only become more extreme and far-reaching in their impacts." The National Oceanic and Atmospheric Administration (NOAA) adds further urgency to the situation, projecting a future where heatwaves become both more frequent and severe.

These consistent findings, echoed by institutions and experts, serve as a clarion call, urging immediate action to confront the consequences of a warming planet. With a strong scientific consensus and extensive data backing the climate change-heatwave connection, the narrative is unequivocal: proactive measures are crucial to address the burgeoning challenge of heatwaves in an increasingly warm world. If we want to stem the tide of worsening heat waves, we have to get serious about involving the reduction of carbon footprints, sustainable practices, and investments in renewable energy and green infrastructure. This isn't just a job for politicians; everyone – businesses, communities, and each of us – needs to be part of finding solutions to protect the world we all live in.

## d. Testimonial evidence with Human attribution

CLIMATE

### The climate crisis isn't coming. It's here – and these heat waves show why we need to act.

Feb 12, 2024 • 9:00 AM ET

By [Jonathan Ross](#)



During the past summer, tens of millions of Americans found themselves living under extreme heat warnings. *Patrick G. Willson / Bloomberg via Getty Images*

WASH, DC — In the face of mounting heatwave incidents across the United States, the scientific community is sounding the alarm about the unmistakable imprint of climate change on these extreme weather patterns. Recent analyses, notably the Environmental Protection Agency's (EPA) Fifth National Climate Assessment, are shedding light on the escalating phenomenon of heatwaves in a warming globe.

According to the EPA, urban centers in the U.S. are experiencing longer heatwaves, now averaging about four days, a significant uptick since the 1960s. Moreover, the heatwave season is extending, now nearly 49 days longer than in previous decades. This troubling trend is symptomatic of a larger crisis, with rising temperatures posing serious risks to the Earth.

Experts like Dr. Emily Sanchez of the National Climate Assessment underscore the direct correlation between rising global temperatures and the intensity of heatwaves, citing human-induced greenhouse gas emissions as a key contributor. Additionally, the World Meteorological Organization (WMO) warns that the frequency and duration of heatwaves are projected to increase further with continued warming. The urban heat island effect further intensifies these heatwaves, particularly in densely populated areas, as highlighted by meteorologist Dr. Aaron Lee. Dr. Susan Patel, specializing in environmental health, points out the severe impact of these temperature extremes on disadvantaged communities, illustrating the intersection of climate change with social and economic issues.

The scientific consensus on this issue is overwhelming. The Intergovernmental Panel on Climate Change (IPCC), a leading world authority, regards heatwaves as a signature of climate change. This view is reinforced by landmark studies published in *Nature Climate Change* and other reputable journals, meticulously linking human actions to rising temperatures and their cascading consequences. "There's irrefutable evidence, spanning from the IPCC to peer-reviewed publications, that our actions are destabilizing the climate," states climate policy analyst Sarah Miller. "Without urgent emissions reductions and adaptation strategies, heatwaves will only become more extreme and far-reaching in their impacts." The National Oceanic and Atmospheric Administration (NOAA) adds further urgency to the situation, projecting a future where heatwaves become both more frequent and severe.

These consistent findings, echoed by institutions and experts, serve as a clarion call, urging immediate action to confront the consequences of a warming planet. With a strong scientific consensus and extensive data backing the climate change-heatwave connection, the narrative is unequivocal: proactive measures are crucial to address the burgeoning challenge of heatwaves in an increasingly warm world. If we want to stem the tide of worsening heat waves, we have to get serious about involving the reduction of carbon footprints, sustainable practices, and investments in renewable energy and green infrastructure. This isn't just a job for politicians; everyone – businesses, communities, and each of us – needs to be part of finding solutions to protect the world we all live in.

## A.3. Pilot Test 2 Stimuli

### a. Demonstrative evidence with AI attribution

CLIMATE

### American Cities Are Sinking. They Could Be Gone By Near Future

Sep 12, 2024 • 9:00 AM ET  
By [ChatGPT](#) & [Jacob Freeman](#)

**What does it mean by that one of the authors is ChatGPT?**

- This article was a collaboration between a human author and ChatGPT, an advanced AI developed by OpenAI. ChatGPT can write about many topics by analyzing patterns from a large amount of data.
- Our newsroom is dedicated to innovation and high-quality journalism. To explore the potential of AI, we combined the efforts of our human author with ChatGPT, based on the prompt we provided.



Patrick G. Wilson / Bloomberg via Getty Images

Increasing coastal flooding and erosion in cities worldwide have raised alarms about the growing impacts of climate change. At our newsroom, we utilize advanced AI technology to analyze data from leading experts and tackle urgent environmental challenges. In this article, AI-generated insights explore the growing threat of climate change, featuring data-driven findings. The following Q&A curated by generative AI, [ChatGPT](#), sheds light on the impact of climate change and the science behind it.

**What does science say about the future of U.S. cities caused by climate change?**

According to climate models, flooding and coastal erosion are expected to become regular occurrences in cities like Miami and San Francisco by 2050. If global warming continues unchecked, parts of these cities could even become uninhabitable due to rising sea levels and stronger storms.

For example, in Miami, sea levels are expected to rise by 2 to 3 feet, which could result in regular flooding during high tides. During storms, the flooding would be even worse, potentially making areas like Miami Beach and downtown Miami prone to constant water damage. On the West Coast, cities like San Francisco will also feel the impact. Climate models predict that as sea levels rise, severe coastal erosion and frequent flooding will threaten the Embarcadero and parts of Oakland, leaving them vulnerable to storm surges.

**What is a climate model and how does it predict future outcomes?**

Think of a climate model as a super-powered simulation of Earth's climate. These models are designed to track and predict changes in the atmosphere, oceans, ice sheets, and land based on real-world data. Scientists use these models to see what might happen to our climate in the future depending on different scenarios—such as how much we continue to emit greenhouse gases.

In short, the model is like running a "what-if" scenario: What if we keep polluting the air? What if we reduce our emissions? The model takes data from temperature records, ocean measurements, and carbon emissions and runs simulations to see what will happen to sea levels, weather patterns, and other key factors.

For example, by inputting current greenhouse gas levels and projecting future emissions, models can predict how much sea levels will rise or how storms might get stronger. The predictions for Miami and San Francisco are based on these simulations, which show the physical expansion of seawater as it warms, along with the melting of ice in places like Greenland and Antarctica.

**How reliable are these models?**

Climate models have a strong history of being reliable. Over the years, they have successfully predicted major climate changes, like the rapid warming of the Arctic and the rise in global temperatures. They've also accurately forecasted the increase in extreme weather events like hurricanes and heatwaves, which we are already seeing more often.

In fact, these models have been forecasting rising sea levels for years, and now, data from satellites and tide gauges confirm that these predictions are becoming reality. So, when climate models show that Miami could see a 2-3 foot rise in sea levels by 2050, and that San Francisco could experience flooding and erosion, we have every reason to believe them.

**What can be done to address these impacts?**

To combat the impacts of climate change, individuals can take specific actions such as reducing household energy consumption by using energy-efficient appliances and turning off electronics when not in use, and cutting air travel to lower carbon emissions. Additionally, switching to non-aerosol products and discussing climate change with others to raise awareness can amplify efforts.

On the policy side, governments should establish mandates for renewable energy adoption and carbon taxes to curb emissions, alongside investment in public transportation infrastructure to reduce reliance on fossil fuels. Incentives for businesses to adopt renewable energy can accelerate the transition to cleaner energy.

Climate models show us a clear picture: without action, cities like Miami and San Francisco could face severe flooding and erosion by 2050. But the models also offer hope—if we act now to reduce emissions and adapt our infrastructure, we can prevent the worst outcomes. The future of these cities is in our hands, and it's up to all of us to take action.

## b. Demonstrative evidence with Human attribution

CLIMATE

### American Cities Are Sinking. They Could Be Gone By Near Future

Sep 12, 2024 • 9:00 AM ET

By [Jacob Freeman](#)



Patrick G. Wilson / Bloomberg via Getty Images

Increasing coastal flooding and erosion in cities worldwide have raised alarms about the growing impacts of climate change. At our newsroom, we collaborate with leading experts to tackle urgent environmental challenges. In this article, we examine the growing threat of climate change, featuring insights from **Dr. Tim Madden**, a senior climate scientist at the Andlinger Center for Energy and the Environment at Princeton University. The following Q&A with Dr. Madden sheds light on the impact of climate change and the science behind it.

#### Dr. Madden, what does science say about the future of U.S. cities caused by climate change?



According to climate models, flooding and coastal erosion are expected to become regular occurrences in cities like Miami and San Francisco by 2050. If global warming continues unchecked, parts of these cities could even become uninhabitable due to rising sea levels and stronger storms.

For example, in Miami, sea levels are expected to rise by 2 to 3 feet, which could result in regular flooding during high tides. During storms, the flooding would be even worse, potentially making areas like Miami Beach and downtown Miami prone to constant water damage. On the West Coast, cities like San Francisco will also feel the impact. Climate models predict that as sea levels rise, severe coastal erosion and frequent flooding will threaten the Embarcadero and parts of Oakland, leaving them vulnerable to storm surges.

#### What is a climate model and how does it predict future outcomes?



Think of a climate model as a super-powered simulation of Earth's climate. These models are designed to track and predict changes in the atmosphere, oceans, ice sheets, and land based on real-world data. Scientists use these models to see what might happen to our climate in the future depending on different scenarios—such as how much we continue to emit greenhouse gases.

In short, the model is like running a "what-if" scenario: What if we keep polluting the air? What if we reduce our emissions? The model takes data from temperature records, ocean measurements, and carbon emissions and runs simulations to see what will happen to sea levels, weather patterns, and other key factors. For example, by inputting current greenhouse gas levels and projecting future emissions, models can predict how much sea levels will rise or how storms might get stronger. The predictions for Miami and San Francisco are based on these simulations, which show the physical expansion of seawater as it warms, along with the melting of ice in places like Greenland and Antarctica.

#### How reliable are these models?



Climate models have a strong history of being reliable. Over the years, they have successfully predicted major climate changes, like the rapid warming of the Arctic and the rise in global temperatures. They've also accurately forecasted the increase in extreme weather events like hurricanes and heatwaves, which we are already seeing more often.

In fact, these models have been forecasting rising sea levels for years, and now, data from satellites and tide gauges confirm that these predictions are becoming reality. So, when climate models show that Miami could see a 2-3 foot rise in sea levels by 2050, and that San Francisco could experience flooding and erosion, we have every reason to believe them.

#### What can be done to address these impacts?



To combat the impacts of climate change, individuals can take specific actions such as reducing household energy consumption by using energy-efficient appliances and turning off electronics when not in use, and cutting air travel to lower carbon emissions. Additionally, switching to non-aerosol products and discussing climate change with others to raise awareness can amplify efforts.

On the policy side, governments should establish mandates for renewable energy adoption and carbon taxes to curb emissions, alongside investment in public transportation infrastructure to reduce reliance on fossil fuels. Incentives for businesses to adopt renewable energy can accelerate the transition to cleaner energy.

Climate models show us a clear picture: without action, cities like Miami and San Francisco could face severe flooding and erosion by 2050. But the models also offer hope—if we act now to reduce emissions and adapt our infrastructure, we can prevent the worst outcomes. The future of these cities is in our hands, and it's up to all of us to take action.

## c. Testimonial evidence with AI attribution

CLIMATE

### American Cities Are Sinking. They Could Be Gone By Near Future

Sep 12, 2024 • 9:00 AM ET

By [ChatGPT](#) & [Jacob Freeman](#)

#### What does it mean by that one of the authors is [ChatGPT](#)?

- This article was a collaboration between a human author and ChatGPT, an advanced AI developed by OpenAI. ChatGPT can write about many topics by analyzing patterns from a large amount of data.
- Our newsroom is dedicated to innovation and high-quality journalism. To explore the potential of AI, we combined the efforts of our human author with ChatGPT, based on the prompt we provided.



Patrick G. Wilson / Bloomberg via Getty Images

Increasing coastal flooding and erosion in cities worldwide have raised alarms about the growing impacts of climate change. At our newsroom, we utilize advanced AI technology to analyze data from leading experts and tackle urgent environmental challenges. In this article, AI-generated insights explore the growing threat of climate change, featuring data-driven findings. The following Q&A curated by generative AI, [ChatGPT](#), sheds light on the impact of climate change and the science behind it.

#### ChatGPT, what does science say about the future of U.S. cities caused by climate change?



By 2050, the probability of regular flooding in areas such as Miami Beach and downtown Miami is nearly certain if we don't take immediate action. This prediction is backed by decades of research and widely accepted across climate models from organizations like NASA, and the U.S. Geological Survey (USGS). The Intergovernmental Panel on Climate Change (IPCC) also projects a 2-3 foot rise in sea levels by mid-century, and NASA's Goddard Institute for Space Studies has recorded real-world data confirming these trends, showing that sea levels are rising faster than early predictions.

The situation on the West Coast is no different. San Francisco will experience severe coastal erosion and frequent flooding. Research from the University of California, supported by coastal scientists like Dr. Gary Griggs, warns that areas like the Embarcadero could experience regular storm surges by mid-century.

#### Is there scientific consensus on this threat?



Yes, the consensus among climate scientists is overwhelming. Leading organizations like the Intergovernmental Panel on Climate Change (IPCC), NASA, and the National Oceanic and Atmospheric Administration (NOAA), along with hundreds of scientists worldwide, have consistently projected a 2-3 foot rise in sea levels by 2050 if emissions continue at their current levels. While models may differ slightly on timing, the overall conclusion is indisputable: coastal cities will face significant challenges.

What makes this consensus so strong is the agreement across multiple institutions. NASA's Goddard Institute for Space Studies, along with experts from the World Meteorological Organization (WMO), and the U.S. Geological Survey (USGS), have all confirmed these projections. Leading researchers at MIT and Stanford have also highlighted that rising sea levels are now occurring faster than initially predicted, further reinforcing the urgency of addressing climate change.

#### How confident scientist are about the prediction?



This is not the view of a single scientist or research group. These conclusions are supported by multiple studies conducted by leading climate researchers worldwide. For example, the Intergovernmental Panel on Climate Change (IPCC) bases its projections on hundreds of peer-reviewed articles from scientists such as Dr. Michael Oppenheimer of Princeton University and Dr. Lisa Randall, a prominent IPCC author, reflecting the collective findings of experts.

The reliability of these predictions stems from the collaborative nature of scientific research. Dr. James Hansen, former head of NASA's Goddard Institute for Space Studies, along with scientists from NOAA and Stanford University, have validated these climate models. Dr. John E. Walsh, a leading researcher from the University of Alaska, has also emphasized the alignment between climate predictions and real-world observations.

#### What can be done to address these impacts?



To combat the impacts of climate change, individuals can take specific actions such as reducing household energy consumption by using energy-efficient appliances and turning off electronics when not in use, and cutting air travel to lower carbon emissions. Additionally, switching to non-aerosol products and discussing climate change with others to raise awareness can amplify efforts.

On the policy side, governments should establish mandates for renewable energy adoption and carbon taxes to curb emissions, alongside investment in public transportation infrastructure to reduce reliance on fossil fuels. Incentives for businesses to adopt renewable energy can accelerate the transition to cleaner energy.

Science shows us a clear picture: without action, cities like Miami and San Francisco could face severe flooding and erosion by 2050. But the models also offer hope—if we act now to reduce emissions and adapt our infrastructure, we can prevent the worst outcomes. The future of these cities is in our hands, and it's up to all of us to take action.

## d. Testimonial evidence with Human attribution

CLIMATE

### American Cities Are Sinking. They Could Be Gone By Near Future

Feb 12, 2024 • 9:00 AM ET

By [Jacob Freeman](#)



Patrick G. Wilson / Bloomberg via Getty Images

Increasing coastal flooding and erosion in cities worldwide have raised alarms about the growing impacts of climate change. At our newsroom, we collaborate with leading experts to tackle urgent environmental challenges. In this article, we examine the growing threat of climate change, featuring insights from Dr. Tim Madden, a senior climate scientist at the Andlinger Center for Energy and the Environment at Princeton University. The following Q&A with Dr. Madden sheds light on the impact of climate change and its scientific evidence.

#### Dr. Madden, What does science say about the future of U.S. cities caused by climate change?



By 2050, the probability of regular flooding in areas such as Miami Beach and downtown Miami is nearly certain if we don't take immediate action. This prediction is backed by decades of research and widely accepted across climate models from organizations like NASA, and the U.S. Geological Survey (USGS). The Intergovernmental Panel on Climate Change (IPCC) also projects a 2-3 foot rise in sea levels by mid-century, and NASA's Goddard Institute for Space Studies has recorded real-world data confirming these trends, showing that sea levels are rising faster than early predictions.

The situation on the West Coast is no different. San Francisco will experience severe coastal erosion and frequent flooding. Research from the University of California, supported by coastal scientists like Dr. Gary Griggs, warns that areas like the Embarcadero could experience regular storm surges by mid-century.

#### Is there scientific consensus on this threat?



Yes, the consensus among climate scientists is overwhelming. Leading organizations like the Intergovernmental Panel on Climate Change (IPCC), NASA, and the National Oceanic and Atmospheric Administration (NOAA), along with hundreds of scientists worldwide, have consistently projected a 2-3 foot rise in sea levels by 2050 if emissions continue at their current levels. While models may differ slightly on timing, the overall conclusion is indisputable: coastal cities will face significant challenges.

What makes this consensus so strong is the agreement across multiple institutions. NASA's Goddard Institute for Space Studies, along with experts from the World Meteorological Organization (WMO), and the U.S. Geological Survey (USGS), have all confirmed these projections. Leading researchers at MIT and Stanford have also highlighted that rising sea levels are now occurring faster than initially predicted, further reinforcing the urgency of addressing climate change.

#### How confident scientist are about the prediction?



This is not the view of a single scientist or research group. These conclusions are supported by multiple studies conducted by leading climate researchers worldwide. For example, the Intergovernmental Panel on Climate Change (IPCC) bases its projections on hundreds of peer-reviewed articles from scientists such as Dr. Michael Oppenheimer of Princeton University and Dr. Lisa Randall, a prominent IPCC author, reflecting the collective findings of experts.

The reliability of these predictions stems from the collaborative nature of scientific research. Dr. James Hansen, former head of NASA's Goddard Institute for Space Studies, along with scientists from NOAA and Stanford University, have validated these climate models. Dr. John E. Walsh, a leading researcher from the University of Alaska, has also emphasized the alignment between climate predictions and real-world observations.

#### What Can Be Done to Address These Impacts?



To combat the impacts of climate change, individuals can take specific actions such as reducing household energy consumption by using energy-efficient appliances and turning off electronics when not in use, and cutting air travel to lower carbon emissions. Additionally, switching to non-aerosol products and discussing climate change with others to raise awareness can amplify efforts.

On the policy side, governments should establish mandates for renewable energy adoption and carbon taxes to curb emissions, alongside investment in public transportation infrastructure to reduce reliance on fossil fuels. Incentives for businesses to adopt renewable energy can accelerate the transition to cleaner energy.

Science shows us a clear picture: without action, cities like Miami and San Francisco could face severe flooding and erosion by 2050. But the models also offer hope—if we act now to reduce emissions and adapt our infrastructure, we can prevent the worst outcomes. The future of these cities is in our hands, and it's up to all of us to take action.

## 4. Pilot Test 3 Stimuli

### a. Demonstrative evidence with AI attribution


CLIMATE

### Miami Beach Could be Under Water Most Days in the Near Future

Oct 15, 2024 • 9:00 AM ET  
By [ChatGPT](#) & [Jacob Freeman](#)

**What does it mean by that one of the authors is *ChatGPT*?**

- This article was a collaboration between a human author and ChatGPT, an advanced AI developed by OpenAI. ChatGPT can write about many topics by analyzing patterns from a large amount of data.
- Our newsroom is dedicated to innovation and high-quality journalism. To explore the potential of AI, we combined the efforts of our human author with ChatGPT, based on the prompt we provided.



A person walking a bicycle through floodwaters on a city © Patrick G. Wilson

Our newsroom is dedicated to innovation and journalistic excellence, and we're actively exploring the possibilities of generative AI. As part of this effort, we've been using **ChatGPT** to examine the impact of climate change. The following Q&A was created by ChatGPT in response to the prompt we provided.

**What challenges do American cities face from climate change, with Miami as a key example?**

Sea level rise caused by climate change can cause significant portions of Miami to be flooded nearly every day. *King Tide Flooding* is a phenomenon where, during high tides, major parts of Miami could be underwater 200-300 days each year, making them completely uninhabitable.

**How do scientists measure sea level?**

Sea level is measured using a combination of methods, including (1) tide gauges, (2) satellite altimetry, (3) Argo floats, (4) GPS, (5) GRACE satellites, and (6) laser ranging. The first two are the most widely used: tide gauges, placed along coastlines, measure the sea's height relative to a fixed point on land, while satellite altimeters measure sea level from space by sending radar signals to the ocean's surface and calculating the time it takes for the signal to return. This allows for tracking changes over time. Additionally, Argo floats monitor ocean temperature and salinity, GPS stations account for land movements like subsidence or uplift, and GRACE satellites measure changes in Earth's gravitational field, detecting shifts in ice mass and ocean levels.

**How much has sea level risen recently and what are the predictions for the future?**

Over the past 50 years, global sea levels have risen by about 8 inches, and the rate is now significantly accelerating. This increase is driven by two main factors: thermal expansion, where warming oceans cause seawater to expand, and the melting of ice sheets in Greenland and Antarctica, as well as glaciers around the world. More than half of the total rise since 1970 has occurred in just the past 30 years, reflecting the rapid acceleration observed since the 1990s. Looking ahead, projections indicate that sea levels could rise by 1 to 2 feet by the end of the century, potentially more if climate change remains unchecked. The impact of this rise will be particularly dramatic in low-lying coastal areas like Miami, where frequent flooding could become the new norm even on sunny days.

**How do scientists use sea level data to make future predictions?**

Sea level data from ocean gauges and satellites is used to assess how thermal expansion and melting ice contribute to rising sea levels. Thermal expansion occurs when warming seawater causes water molecules to move more vigorously, increasing volume, which is linked to global warming as higher temperatures enhance heat absorption by the oceans. Additionally, melting ice from glaciers and polar ice sheets, especially in Greenland and Antarctica, adds significant freshwater to the ocean, exacerbating sea level rise.

Climate models, which are complex simulations designed to analyze various climate variables, incorporate these processes to simulate future scenarios and estimate potential sea level increases. Analyzing the interaction between thermal expansion and melting ice helps project flooding risks, including the frequency of flooding events during king tides under different greenhouse gas emission scenarios.

**How would this affect Miami?**

If sea levels were to rise by 2 feet, many low-lying areas of cities like Miami would face significant and frequent flooding, particularly during king tide flooding—periods when high tides push water onto streets and into neighborhoods. Miami already experiences king tide flooding several times a year. In recent years, Miami Beach and other coastal areas have seen flooding 5-10 times annually, with water levels rising 1-2 feet above normal high tides.

As sea levels continue to rise, flooding during high tides, which currently occurs occasionally, could become an almost daily event. With just a 2-foot rise in sea levels, parts of Miami would experience flooding not only during king tides but even during regular high tides, leading to 200-300 days of flooding per year. Under such conditions, many low-lying areas of Miami could become uninhabitable.

## b. Demonstrative evidence with Human attribution

CLIMATE

### Miami Beach Could be Under Water Most Days in the Near Future

Oct 15, 2024 • 9:00 AM ET

By [Jacob Freeman](#)



A person walking a bicycle through floodwaters on a city © Patrick G. Wilson

Our newsroom is committed to innovation and journalistic excellence. As part of this, we're collaborating with **Dr. James Whitman**, a climate scientist at MIT, to explore the impact of climate change. The following Q&A is based on our interview with Dr. Whitman and his responses to our questions.

#### Dr. Whitman, What challenges do American cities face from climate change, with Miami as a key example?



Sea level rise caused by climate change can cause significant portions of Miami to be flooded nearly every day. *King Tide Flooding* is a phenomenon where, during high tides, major parts of Miami could be underwater 200-300 days each year, making them completely uninhabitable.

#### How do scientists measure sea level?



Sea level is measured using a combination of methods, including (1) tide gauges, (2) satellite altimetry, (3) Argo floats, (4) GPS, (5) GRACE satellites, and (6) laser ranging. The first two are the most widely used: tide gauges, placed along coastlines, measure the sea's height relative to a fixed point on land, while satellite altimeters measure sea level from space by sending radar signals to the ocean's surface and calculating the time it takes for the signal to return. This allows for tracking changes over time. Additionally, Argo floats monitor ocean temperature and salinity, GPS stations account for land movements like subsidence or uplift, and GRACE satellites measure changes in Earth's gravitational field, detecting shifts in ice mass and ocean levels.

#### How much has sea level risen recently and what are the predictions for the future?



Over the past 50 years, global sea levels have risen by about 8 inches, and the rate is now significantly accelerating. This increase is driven by two main factors: thermal expansion, where warming oceans cause seawater to expand, and the melting of ice sheets in Greenland and Antarctica, as well as glaciers around the world. More than half of the total rise since 1970 has occurred in just the past 30 years, reflecting the rapid acceleration observed since the 1990s.

Looking ahead, projections indicate that sea levels could rise by 1 to 2 feet by the end of the century, potentially more if climate change remains unchecked. The impact of this rise will be particularly dramatic in low-lying coastal areas like Miami, where frequent flooding could become the new norm even on sunny days.

#### How do scientists use sea level data to make future predictions?



Sea level data from ocean gauges and satellites is used to assess how thermal expansion and melting ice contribute to rising sea levels. Thermal expansion occurs when warming seawater causes water molecules to move more vigorously, increasing volume, which is linked to global warming as higher temperatures enhance heat absorption by the oceans. Additionally, melting ice from glaciers and polar ice sheets, especially in Greenland and Antarctica, adds significant freshwater to the ocean, exacerbating sea level rise.

Climate models, which are complex simulations designed to analyze various climate variables, incorporate these processes to simulate future scenarios and estimate potential sea level increases. Analyzing the interaction between thermal expansion and melting ice helps project flooding risks, including the frequency of flooding events during king tides under different greenhouse gas emission scenarios.

#### How would this affect Miami?



If sea levels were to rise by 2 feet, many low-lying areas of cities like Miami would face significant and frequent flooding, particularly during king tide flooding—periods when high tides push water onto streets and into neighborhoods. Miami already experiences king tide flooding several times a year. In recent years, Miami Beach and other coastal areas have seen flooding 5-10 times annually, with water levels rising 1-2 feet above normal high tides.

As sea levels continue to rise, flooding during high tides, which currently occurs occasionally, could become an almost daily event. With just a 2-foot rise in sea levels, parts of Miami would experience flooding not only during king tides but even during regular high tides, leading to 200-300 days of flooding per year. Under such conditions, many low-lying areas of Miami could become uninhabitable.

## c. Testimonial evidence with AI attribution


CLIMATE

### Miami Beach Could be Under Water Most Days in the Near Future

Oct 15, 2024 • 9:00 AM ET  
By [ChatGPT](#) & [Jacob Freeman](#)

**What does it mean by that one of the authors is *ChatGPT*?**

- This article was a collaboration between a human author and ChatGPT, an advanced AI developed by OpenAI. ChatGPT can write about many topics by analyzing patterns from a large amount of data.
- Our newsroom is dedicated to innovation and high-quality journalism. To explore the potential of AI, we combined the efforts of our human author with ChatGPT, based on the prompt we provided.



A person walking a bicycle through floodwaters on a city © Patrick G. Wilson

Our newsroom is dedicated to innovation and journalistic excellence, and we're actively exploring the possibilities of generative AI. As part of this effort, we've been using **ChatGPT** to examine the impact of climate change. The following Q&A was created by ChatGPT in response to the prompt we provided.

**What challenges do American cities face from climate change, with Miami as a key example?**

Sea level rise caused by climate change could cause significant portions of Miami to be flooded nearly every day. Based on their most recent analyses, many scientists warn that significant portions of Miami could be underwater 200-300 days each year, making them completely uninhabitable.

**Does science agree with climate predictions?**

These predictions have been confirmed by research from NASA, the National Oceanic and Atmospheric Administration (NOAA), and the Intergovernmental Panel on Climate Change (IPCC). The IPCC, in particular, is instrumental in producing authoritative research on climate change forecasts. Its most recent report highlights the alarming acceleration of sea-level rise, projecting an increase of 1 to 2 feet by the end of the century, with some scenarios suggesting even higher levels if greenhouse gas emissions continue unchecked.

Coastal cities like Miami face extreme risks due to their low elevation and vulnerability to flooding. Dr. David Miller, one of the leading authors states, "With the current rate of greenhouse gas emissions, the impacts on coastal cities will be severe. Miami could experience flooding, potentially resulting in 200-300 days of flooding per year."

**What is the IPCC, and which scientists were involved?**

The Intergovernmental Panel on Climate Change (IPCC) produces the most comprehensive and authoritative research on climate change predictions. Established by the United Nations, the IPCC synthesizes findings from thousands of peer-reviewed studies conducted by scientists worldwide. Its reports are regarded as the gold standard in climate science, meticulously reviewed by hundreds of experts to ensure accuracy and reliability.

The IPCC reports are the product of collaboration among thousands of scientists from across the globe. Each assessment involves contributions from over 800 climate experts from fields such as oceanography, atmospheric science, and environmental studies. These experts come from leading institutions worldwide, such as Harvard University, Stanford University, MIT, Oxford University, ETH Zurich, Imperial College London, and the University of Copenhagen, all of which contribute vital insights into climate modeling.

**Is there scientific consensus about the predictions of sea level rise caused by climate change?**

There is overwhelming scientific consensus on the predictions of sea level rise caused by climate change, supported by nearly every major scientific organization worldwide. Dr. Robert Wilson notes that respected institutions, including the American Meteorological Society, the Union of Concerned Scientists, the National Academy of Sciences, and the World Meteorological Organization, agree on the implications of climate change, particularly concerning rising sea levels. He emphasizes that these institutions have reviewed the data and concluded, "Sea levels are rising, and the impacts on cities like Miami will be catastrophic if left unchecked."

Dr. John Williams, a senior climate scientist at Harvard, states, "The data is clear, and scientists solidly agree on its implications for sea level rise." While some may debate the speed or extent of the rise, the consensus on the threat to coastal communities is unequivocal. No prominent organization, including NASA, NOAA, and the IPCC, disputes this fact.

**How would this affect Miami?**

Scientists have confirmed that many low-lying areas of Miami will face significant and frequent flooding as sea levels continue to rise, according to Dr. Emily Parker from the National Oceanic and Atmospheric Administration (NOAA). Reports from the Intergovernmental Panel on Climate Change (IPCC) and NASA project that with a 2-foot rise in sea levels, parts of the city will experience increased flooding, impacting both high tide events and regular conditions. This could result in 200-300 days of flooding per year, ultimately making large areas of Miami difficult to inhabit. Experts from renowned scientific institutions, including NOAA and NASA, have reiterated that under this scenario, many vulnerable areas of Miami could become uninhabitable, leading to severe disruptions across the city.

## d. Testimonial evidence with Human attribution

CLIMATE

### Miami Beach Could be Under Water Most Days in the Near Future

Oct 15, 2024 • 9:00 AM ET  
By [Jacob Freeman](#)



A person walking a bicycle through floodwaters on a city © Patrick G. Willson

Our newsroom is committed to innovation and journalistic excellence. As part of this, we're collaborating with **Dr. James Whitman**, a climate scientist at MIT, to explore the impact of climate change. The following Q&A is based on our interview with Dr. Whitman and his responses to our questions.

**Dr. Whitman, What challenges do American cities face from climate change, with Miami as a key example?**

Sea level rise caused by climate change could cause significant portions of Miami to be flooded nearly every day. Based on their most recent analyses, many scientists warn that significant portions of Miami could be underwater 200-300 days each year, making them completely uninhabitable.

**Does science agree with climate predictions?**

These predictions have been confirmed by research from NASA, the National Oceanic and Atmospheric Administration (NOAA), and the Intergovernmental Panel on Climate Change (IPCC). The IPCC, in particular, is instrumental in producing authoritative research on climate change forecasts. Its most recent report highlights the alarming acceleration of sea-level rise, projecting an increase of 1 to 2 feet by the end of the century, with some scenarios suggesting even higher levels if greenhouse gas emissions continue unchecked.

Coastal cities like Miami face extreme risks due to their low elevation and vulnerability to flooding. Dr. David Miller, one of the leading authors states, "With the current rate of greenhouse gas emissions, the impacts on coastal cities will be severe. Miami could experience flooding, potentially resulting in 200-300 days of flooding per year."

**What is the IPCC, and which scientists were involved?**

The Intergovernmental Panel on Climate Change (IPCC) produces the most comprehensive and authoritative research on climate change predictions. Established by the United Nations, the IPCC synthesizes findings from thousands of peer-reviewed studies conducted by scientists worldwide. Its reports are regarded as the gold standard in climate science, meticulously reviewed by hundreds of experts to ensure accuracy and reliability.

The IPCC reports are the product of collaboration among thousands of scientists from across the globe. Each assessment involves contributions from over 800 climate experts from fields such as oceanography, atmospheric science, and environmental studies. These experts come from leading institutions worldwide, such as Harvard University, Stanford University, MIT, Oxford University, ETH Zurich, Imperial College London, and the University of Copenhagen, all of which contribute vital insights into climate modeling.

**Is there scientific consensus about the predictions of sea level rise caused by climate change?**

There is overwhelming scientific consensus on the predictions of sea level rise caused by climate change, supported by nearly every major scientific organization worldwide. Dr. Robert Wilson notes that respected institutions, including the American Meteorological Society, the Union of Concerned Scientists, the National Academy of Sciences, and the World Meteorological Organization, agree on the implications of climate change, particularly concerning rising sea levels. He emphasizes that these institutions have reviewed the data and concluded, "Sea levels are rising, and the impacts on cities like Miami will be catastrophic if left unchecked."

Dr. John Williams, a senior climate scientist at Harvard, states, "The data is clear, and scientists solidly agree on its implications for sea level rise." While some may debate the speed or extent of the rise, the consensus on the threat to coastal communities is unequivocal. No prominent organization, including NASA, NOAA, and the IPCC, disputes this fact.

**How would this affect Miami?**

Scientists have confirmed that many low-lying areas of Miami will face significant and frequent flooding as sea levels continue to rise, according to Dr. Emily Parker from the National Oceanic and Atmospheric Administration (NOAA). Reports from the Intergovernmental Panel on Climate Change (IPCC) and NASA project that with a 2-foot rise in sea levels, parts of the city will experience increased flooding, impacting both high tide events and regular conditions. This could result in 200-300 days of flooding per year, ultimately making large areas of Miami difficult to inhabit. Experts from renowned scientific institutions, including NOAA and NASA, have reiterated that under this scenario, many vulnerable areas of Miami could become uninhabitable, leading to severe disruptions across the city.

## e. Control condition

CULTURE

### Honoring Voices of Resilience: 2024 Nobel Prizes in Literature and Peace Announced

Oct 20, 2024 • 9:00 AM ET

By [Jacob Freeman](#)



The Nobel Prize ceremony venue, Stockholm, Sweden. © Patrick G. Willson

The Nobel Prize awardees have been announced, recognizing outstanding contributions to humanity across various fields, including Physics, Chemistry, and Medicine. Established by Alfred Nobel's will in 1895, the prize is one of the most prestigious awards in the world, celebrating those who have advanced knowledge and improved human welfare. Among its categories, the Nobel Prize in Literature and the Nobel Peace Prize stand out for their cultural and humanitarian significance, reflecting a commitment to fostering peace and understanding.

#### Who received the Nobel Prize in Literature in 2024?

The 2024 Nobel Prize in Literature was awarded to Han Kang, a celebrated South Korean author known for her exploration of identity, memory, and trauma. Her writing journey began in childhood, shaped by South Korea's tumultuous history. Han's notable works, including "*The Vegetarian*" and "*Human Acts*," have garnered acclaim for their lyrical prose. "*The Vegetarian*" tells the story of a woman who decides to stop eating meat, exploring themes of autonomy and rebellion against societal expectations. The Nobel Committee praised her ability to "illuminate the human condition," emphasizing the transformative power of her storytelling.

In her acceptance speech, Han reflected on her responsibility to give voice to the silenced, stating, "Words have the power to heal wounds and bring forth understanding in a fractured world." Her recognition as the first South Korean woman to receive this honor marks a significant moment in literary history, celebrating her achievements and the rich tapestry of voices emerging from South Korea, which continue to inspire readers globally.

#### Who received the Nobel Peace Prize in 2024?

The 2024 Nobel Peace Prize was awarded to Nihon Hidankyo, representing the hibakusha, or survivors of the atomic bombings in Japan. Founded by survivors from Hiroshima and Nagasaki, Nihon Hidankyo advocates for nuclear disarmament and raises awareness of the lasting effects of nuclear warfare. Their work emphasizes the human stories behind the statistics, ensuring that the voices of those who lived through such catastrophic events are not lost.

This year's award highlights their relentless advocacy and commitment to ensuring that the horrors of nuclear war are never forgotten. The Nobel Committee stated, "This award recognizes the courage of those who continue to speak out against nuclear weapons, seeking a peaceful future for all." Nihon Hidankyo underscores the importance of dialogue and education in promoting peace, reminding the world of the ongoing impact of nuclear weapons and the need for continued disarmament efforts. Their mission serves as a poignant reminder that the fight for peace is ongoing and requires collective global effort.

The decision to award the Peace Prize to Nihon Hidankyo serves as a powerful reminder of the human cost of war and the imperative for global cooperation in disarmament. As the organization continues its mission, it advocates for a world free from nuclear threats, calling for policies that ensure the safety of future generations and protect the most vulnerable populations from the consequences of nuclear conflict.

#### What is the Process for Nominations?

The nomination process for the Nobel Prize in Literature and the Nobel Peace Prize is rigorous and confidential. Nominations must be submitted by the end of January each year, with eligibility extending to previous laureates, national government members, and university professors. This exclusivity ensures nominations come from individuals well-versed in their fields.

Once nominations are received, the Nobel Committees for Literature and Peace review the candidates, analyzing their contributions to determine their impact. Composed of experts in their respective fields, the committees evaluate each nominee comprehensively. They make recommendations to the respective awarding institutions—the Swedish Academy for Literature and the Norwegian Nobel Committee for the Peace Prize.

## Appendix B: Measures

### Measures (Main experiment)

#### Trust in scientists

1. How much expertise do environmental scientists have?  
(1= Very limited, 7 = Very extensive)
2. How honest or dishonest are environmental scientists?  
(1= Very dishonest, 7 = Very honest)
3. How concerned or not concerned are environmental scientists about people's well-being?  
(1= Very unconcerned, 7 = Very concerned)
4. How willing or unwilling are most scientists to be transparent?  
(1= Very unwilling, 7 = Very willing)
5. How intelligent or unintelligent are environmental scientists?  
(1= Very unintelligent, 7 = Very intelligent)
6. How ethical or unethical are environmental scientists?  
(1= Very unethical, 7 = Very ethical)
7. How eager or uneager are environmental scientists to improve others' lives?  
(1= Very uneager, 7 = Very eager)
8. How much do environmental scientists pay attention to other people's views?  
(1= Very little, 7 = Very much)

#### Machine heuristic

Please indicate the extent to which you agree with the following statements.

(1= Strongly disagree, 7 = Strongly agree)

1. AI is more reliable than humans in accurately reporting scientific information.
2. AI is more dependable than humans in accurately reporting scientific information.
3. I trust AI more than humans in accurately reporting scientific information.
4. I am more confident in AI than humans in accurately reporting scientific information.
5. I believe AI is more competent than humans in accurately reporting scientific information.
6. I have a higher expectation for AI than humans in accurately reporting scientific information.
7. AI is better than humans in accurately reporting scientific information.

### Message credibility

Please indicate the extent to which you agree with the following statements about the news article you read.

(1= Strongly disagree, 7 = Strongly agree)

1. Accurate
2. Believable
3. Credible
4. Trustworthy

### Threat to freedom

Please indicate the extent to which you agree with the following statements about the news article you read.

(1= Strongly disagree, 7 = Strongly agree)

5. The news article tried to manipulate me.
6. The news article tried to make a decision for me.
7. The news article threatened my freedom to choose.
8. The news article tried to persuade me.

### Message acceptance

Please indicate the extent to which you agree with the following statements.

(1= Strongly disagree, 7 = Strongly agree)

1. Rising sea levels caused by climate change pose a serious threat to Miami Beach.
2. By the middle of the century, large sections of Miami Beach will experience regular flooding due to rising sea levels.
3. Without significant action, flooding will become a near-constant issue for Miami Beach residents.
4. Frequent flooding will disrupt life in Miami Beach for 200 to 300 days a year.
5. I doubt that Miami Beach will actually be in danger of regular flooding anytime soon.
6. Miami Beach will become uninhabitable if sea levels continue rising as projected.

### Policy support

To what extent do you agree with the following statements?

(1= Strongly oppose, 7 = Strongly support)

1. Eliminating funding for government programs dedicated to climate action
2. Rejoining international climate treaties (e.g., Paris Agreement)
3. Implementing carbon taxes on greenhouse gas emissions
4. Setting enforceable caps on fossil fuel emissions for industries

5. Mandating energy efficiency standards for personal vehicles and household appliances
6. Taxing corporations based on carbon emissions
7. Requiring power plants to eliminate all carbon emissions by 2040

Manipulation checks questions

Author manipulation check question

According to the article you just read, who is listed as the author?

- James Preston (Human)
- ChatGPT (AI)

Evidence manipulation check: (1) Tally questions

We'll ask about the details from the article you read. If the article didn't mention something we ask about, please select 'No.' It's possible that none or only some of these details were included.

(1 = Yes, 0 = No)

1. Did the article mention the so-called "King Tides"?
2. Did the article explain how "thermal expansion" works?
3. Did the article talk about the melting ice from glaciers or polar ice sheets?
4. Did the article mention methods for measuring sea level, like tide gauges, satellite altimetry, Argo floats, or GRACE satellites?
5. Did the article explain how the Intergovernmental Panel on Climate Change (IPCC) works?
6. Did the article reference multiple scientific organizations such as NASA, NOAA, and IPCC?
7. Did the article include multiple quotes from different climate scientists?

Evidence manipulation check: (2) Evidence quality questions

You'll see statements about the article you read. Please rate how strongly you agree or disagree with each one.

(1= Strongly disagree, 7 = Strongly agree)

1. The article walked me through how sea level data is measured, detailing tools like tide gauges and satellites.
2. The article explained how scientists input real-world data into climate models to predict future flooding in Miami Beach.
3. The article provided a detailed look at how sea level data are analyzed before drawing conclusions about climate change.
4. The article highlighted the scientific consensus among leading experts and institutions.

5. The article cited multiple scientists and institutions to support its claims about rising sea levels.
6. The article emphasized the credibility of the IPCC (Intergovernmental Panel on Climate Change) to support its conclusions on sea-level rise.

#### Attention check

Below is a list of colors. To show that you're still paying attention, please select the color purple.

- Blue
- Brown
- Purple
- Red
- Green
- Yellow

#### Demographics

1. What is your age (in years)?
2. What is your gender?
  - Male
  - Female
  - Non-binary
  - Other, please specify
3. What is your race?
  - White
  - Black or African American
  - Hispanic
  - Asian
  - American Indian or Alaska Native
  - Native Hawaiian or Pacific Islander
  - Other, please specify
4. Generally speaking, do you usually think of yourself as a Democrat, a Republican, an Independent, or something else?
  - Strong Democrat
  - Moderate Democrat
  - Lean Democrat
  - Independent

- Lean Republican
- Moderate Republican
- Strong Republican

5. What is your education level?

- Less than high school degree
- High school degree or equivalent (e.g., GED)
- Some college
- 2 year degree
- 4 year degree
- Professional Degree
- Masters and/ or Doctorate

6. What is your present religion, if any?

- Protestant (e.g., Baptist, Methodist, Lutheran, Pentecostal, etc.)
- Roman Catholic
- Mormon (Church of Jesus Christ of Latter-day Saints)
- Orthodox (e.g., Greek, Russian, or other Orthodox)
- Jewish
- Muslim
- Buddhist
- Hindu
- Nothing in particular
- Something else (please specify)

## References

- Allen, M., & Preiss, R. W. (1997). Comparing the persuasiveness of narrative and statistical evidence using meta-analysis. *Communication Research Reports*, 14(2), 125–131. <https://doi.org/10.1080/08824099709388654>
- Appelman, A., & Sundar, S. S. (2016). Measuring Message Credibility: Construction and Validation of an Exclusive Scale. *Journalism & Mass Communication Quarterly*, 93(1), 59–79. <https://doi.org/10.1177/1077699015606057>
- Areni, C. S., & Lutz, R. J. (1988). The Role of Argument Quality in the Elaboration Likelihood Model. *ACR North American Advances*, NA-15. <https://www.acrwebsite.org/volumes/6646/volumes/v15/NA-15/full>
- Badas, A., & Schmidt, E. R. (2023). Social Imagery and Judicial Legitimacy: Evidence From Evangelical Christians. *Political Research Quarterly*, 10659129231197207. <https://doi.org/10.1177/10659129231197207>
- Bartoš, V., Bauer, M., Cahlíková, J., & Chytilová, J. (2022). Communicating doctors' consensus persistently increases COVID-19 vaccinations. *Nature*, 606(7914), 542–549. <https://doi.org/10.1038/s41586-022-04805-y>
- Bauer, M. W., Allum, N., & Miller, S. (2007). What can we learn from 25 years of PUS survey research? Liberating and expanding the agenda. *Public Understanding of Science*, 16(1), 79–95. <https://doi.org/10.1177/0963662506071287>
- Bayes, R., & Druckman, J. N. (2021). Motivated reasoning and climate change. *Human Response to Climate Change: From Neurons to Collective Action*, 42, 27–35. <https://doi.org/10.1016/j.cobeha.2021.02.009>

- Bayes, R., Druckman, J. N., Goods, A., & Molden, D. C. (2020). When and How Different Motives Can Drive Motivated Political Reasoning. *Political Psychology*, 41(5), 1031–1052. <https://doi.org/10.1111/pops.12663>
- Benoit, W. L. (2007). Determinants of defense in presidential debates. *Communication Research Reports*, 24, 319–325. <https://doi.org/10.1080/08824090701624221>
- Besley, J. C., Lee, N. M., & Pressgrove, G. (2021). Reassessing the Variables Used to Measure Public Perceptions of Scientists. *Science Communication*, 43(1), 3–32. <https://doi.org/10.1177/1075547020949547>
- Besley, J. C., & Tiffany, L. A. (2023). What are you assessing when you measure “trust” in scientists with a direct measure? *Public Understanding of Science*, 09636625231161302. <https://doi.org/10.1177/09636625231161302>
- Bhaduri, G., & Ha-Brookshire, J. (2017). The role of brand schemas, information transparency, and source of message on apparel brands’ social responsibility communication. *Journal of Marketing Communications*, 23(3), 293–310. <https://doi.org/10.1080/13527266.2015.1040441>
- Blair, J. A. (2015). What Is Informal Logic? In F. H. van Eemeren & B. Garssen (Eds.), *Reflections on Theoretical Issues in Argumentation Theory* (pp. 27–42). Springer International Publishing. [https://doi.org/10.1007/978-3-319-21103-9\\_2](https://doi.org/10.1007/978-3-319-21103-9_2)
- Blair, J. A., & Johnson, R. H. (2000). Informal logic: An overview. *Informal Logic*, 20(2).
- Bolsen, T., & Druckman, J. N. (2018). Do partisanship and politicization undermine the impact of a scientific consensus message about climate change? *Group Processes*

- & *Intergroup Relations*, 21(3), 389–402.  
<https://doi.org/10.1177/1368430217737855>
- Bolsen, T., Druckman, J. N., & Cook, F. L. (2014). The Influence of Partisan Motivated Reasoning on Public Opinion. *Political Behavior*, 36(2), 235–262.  
<https://doi.org/10.1007/s11109-013-9238-0>
- Brehm, J. W. (1966). A theory of psychological reactance (pp. x, 135). Academic Press.
- Brehm, S. S., & Brehm, J. W. (1981). *Psychological reactance: A theory of freedom and control*. Academic Press.
- Carpenter, C. J. (2015). A Meta-Analysis of the ELM's Argument Quality × Processing Type Predictions. *Human Communication Research*, 41(4), 501–534.
- Chadha, K., & and Koliska, M. (2015). Newsrooms and Transparency in the Digital Age. *Journalism Practice*, 9(2), 215–229.  
<https://doi.org/10.1080/17512786.2014.924737>
- Chen, C., & Sundar, S. S. (2024). Communicating and combating algorithmic bias: Effects of data diversity, labeler diversity, performance bias, and user feedback on AI trust. *Human–Computer Interaction*, 1–37.  
<https://doi.org/10.1080/07370024.2024.2392494>
- Chen, Meng., & Bell, R. A. (2021). A meta-analysis of the impact of point of view on narrative processing and persuasion in health messaging. *Psychology & Health*, 0(0), 1–18. <https://doi.org/10.1080/08870446.2021.1894331>
- Chen, Serena., & Chaiken, Shelly. (1999). The heuristic-systematic model in its broader context. In *Dual-process theories in social psychology* (pp. 73–96). The Guilford Press.

- Chinn, S., & Hart, P. S. (2023). Climate Change Consensus Messages Cause Reactance. *Environmental Communication*, 17(1), 51–59.  
<https://doi.org/10.1080/17524032.2021.1910530>
- Cho, H., & Choi, J. (2010). Predictors and the Role of Attitude Toward the Message and Perceived Message Quality in Gain- and Loss-Frame Antidrug Persuasion of Adolescents. *Health Communication*, 25(4), 303–311.  
<https://doi.org/10.1080/10410231003773326>
- Cologna, V., Mede, N. G., Berger, S., Besley, J., Brick, C., Joubert, M., Maibach, E. W., Mihelj, S., Oreskes, N., Schäfer, M. S., van der Linden, S., Abdul Aziz, N. I., Abdulsalam, S., Shamsi, N. A., Aczel, B., Adinugroho, I., Alabrese, E., Aldoh, A., Alfano, M., ... Zwaan, R. A. (2025). Trust in scientists and their role in society across 68 countries. *Nature Human Behaviour*.  
<https://doi.org/10.1038/s41562-024-02090-5>
- Cook, J., & Lewandowsky, S. (2016). Rational Irrationality: Modeling Climate Change Belief Polarization Using Bayesian Networks. *Topics in Cognitive Science*, 8(1), 160–179. <https://doi.org/10.1111/tops.12186>
- Coppock, A. (2023). *Persuasion in Parallel: How Information Changes Minds about Politics*. University of Chicago Press.  
<https://doi.org/10.7208/chicago/9780226821832.001.0001>
- Curry, A. L., & Stroud, N. J. (2021). The effects of journalistic transparency on credibility assessments and engagement intentions. *Journalism*, 22(4), 901–918.  
<https://doi.org/10.1177/1464884919850387>

- Dai, Y., Lee, Jiyoung, & Kim, J. W. (2024). AI vs. Human Voices: How Delivery Source and Narrative Format Influence the Effectiveness of Persuasion Messages. *International Journal of Human-Computer Interaction*, 40(24), 8735–8749. <https://doi.org/10.1080/10447318.2023.2288734>
- de Fine Licht, J. (2014). Transparency actually: How transparency affects public perceptions of political decision-making. *European Political Science Review*, 6(2), 309–330. Cambridge Core. <https://doi.org/10.1017/S1755773913000131>
- De Wit, J. B. F., Das, E., & Vet, R. (2008). What works best: Objective statistics or a personal testimonial? An assessment of the persuasive effects of different types of message evidence on risk perception. *Health Psychology*, 27, 110–115. <https://doi.org/10.1037/0278-6133.27.1.110>
- Dehnert, M., & Mongeau, P. A. (2022). Persuasion in the Age of Artificial Intelligence (AI): Theories and Complications of AI-Based Persuasion. *Human Communication Research*, 48(3), 386–403. <https://doi.org/10.1093/hcr/hqac006>
- Dietz, T., Dan, A., & Shwom, R. (2007). Support for Climate Change Policy: Social Psychological and Social Structural Influences. *Rural Sociology*, 72(2), 185–214. <https://doi.org/10.1526/003601107781170026>
- Dillard, J. P., & Shen, L. (2005). On the Nature of Reactance and its Role in Persuasive Health Communication. *Communication Monographs*, 72(2), 144–168. <https://doi.org/10.1080/03637750500111815>
- Ding, D., Maibach, E. W., Zhao, X., Roser-Renouf, C., & Leiserowitz, A. (2011). Support for climate policy and societal action are linked to perceptions about

scientific agreement. *Nature Climate Change*, 1(9), 462–466.

<https://doi.org/10.1038/nclimate1295>

Dixon, G. (2016). Applying the Gateway Belief Model to Genetically Modified Food Perceptions: New Insights and Additional Questions. *Journal of Communication*, 66(6), 888–908. <https://doi.org/10.1111/jcom.12260>

Dixon, G., Hmielowski, J., & Ma, Y. (2023). More Evidence of Psychological Reactance to Consensus Messaging: A Response to van der Linden, Maibach, and Leiserowitz (2019). *Environmental Communication*, 17(1), 9–15.

<https://doi.org/10.1080/17524032.2019.1671472>

Donovan, K., Kellstedt, P. M., Key, E. M., & Lebo, M. J. (2020). Motivated Reasoning, Public Opinion, and Presidential Approval. *Political Behavior*, 42(4), 1201–1221.

<https://doi.org/10.1007/s11109-019-09539-8>

Douglas, B. D., Ewell, P. J., & Brauer, M. (2023). Data quality in online human-subjects research: Comparisons between MTurk, Prolific, CloudResearch, Qualtrics, and SONA. *PLOS ONE*, 18(3), e0279720.

<https://doi.org/10.1371/journal.pone.0279720>

Dragojevic, M., Occa, A., & Dayton, Z. A. (2023). Effects of Character Accent on Perceived Similarity, Transportation, and Narrative Persuasion. *Health Communication*, 1–10. <https://doi.org/10.1080/10410236.2023.2185926>

Druckman, J. N. (2022). A Framework for the Study of Persuasion. *Annual Review of Political Science*, 25(1), 65–88. <https://doi.org/10.1146/annurev-polisci-051120-110428>

- Druckman, J. N., & McGrath, M. C. (2019). The evidence for motivated reasoning in climate change preference formation. *Nature Climate Change*, 9(2), 111–119. <https://doi.org/10.1038/s41558-018-0360-1>
- Dubbink, W., Graafland, J., & van Liedekerke, L. (2008). CSR, Transparency and the Role of Intermediate Organisations. *Journal of Business Ethics*, 82(2), 391–406. <https://doi.org/10.1007/s10551-008-9893-y>
- Duggan, P. (2018, November 28). Sins of the fathers. *Washington Post*. <https://www.washingtonpost.com/news/magazine/wp/2018/11/28/feature/the-confederacy-was-built-on-slavery-how-can-so-many-southern-whites-still-believe-otherwise/>
- Evans-Reeves, K A., Hatchard, J L., & Gilmore, A B . (2015). ‘It will harm business and increase illicit trade’: An evaluation of the relevance, quality and transparency of evidence submitted by transnational tobacco companies to the UK consultation on standardised packaging 2012. *Tobacco Control*, 24(e2), e168. <https://doi.org/10.1136/tobaccocontrol-2014-051930>
- Fingerhut, H. (2017, September 13). Republicans much ‘colder’ than Democrats in views of professors. *Pew Research Center*. <https://www.pewresearch.org/short-reads/2017/09/13/republicans-much-colder-than-democrats-in-views-of-professors/>
- Funk, C., Johnson, C., & Hefferon, M. (2019, August 5). 5 key findings about public trust in scientists in the U.S. *Pew Research Center*. <https://www.pewresearch.org/short-reads/2019/08/05/5-key-findings-about-public-trust-in-scientists-in-the-su-s/>

- Galvan, M. J., Payne, B. K., Hannay, J., Georgeson, A. R., & Muscatell, K. A. (2023). What Does the MacArthur Scale of Subjective Social Status Measure? Separating Economic Circumstances and Social Status to Predict Health. *Annals of Behavioral Medicine*, kaad054. <https://doi.org/10.1093/abm/kaad054>
- The Guardians (2020, Sep 8). A robot wrote this entire article. Are you scared yet, human? <https://www.theguardian.com/commentisfree/2020/sep/08/robot-wrote-this-article-gpt-3>
- Gollwitzer, A., Martel, C., Brady, W. J., Pärnamets, P., Freedman, I. G., Knowles, E. D., & Van Bavel, J. J. (2020). Partisan differences in physical distancing are linked to health outcomes during the COVID-19 pandemic. *Nature Human Behaviour*, 4(11), 1186–1197. <https://doi.org/10.1038/s41562-020-00977-7>
- Gottfried, J., Walker, M., & Mitchell, A. (2020, August 31). Americans See Skepticism of News Media as Healthy, Say Public Trust in the Institution Can Improve. Pew Research Center. <https://www.pewresearch.org/journalism/2020/08/31/americans-see-skepticism-of-news-media-as-healthy-say-public-trust-in-the-institution-can-improve/>
- Graefe, A., Haim, M., Haarmann, B., & Brosius, H.-B. (2018). Readers' perception of computer-generated news: Credibility, expertise, and readability. *Journalism*, 19(5), 595–610. <https://doi.org/10.1177/1464884916641269>
- Grimmelikhuijsen, S. G., & Meijer, A. J. (2014). Effects of Transparency on the Perceived Trustworthiness of a Government Organization: Evidence from an Online Experiment. *Journal of Public Administration Research and Theory*, 24(1), 137–157. <https://doi.org/10.1093/jopart/mus048>

- Grossman, G., Kim, S., Rexer, J. M., & Thirumurthy, H. (2020). Political partisanship influences behavioral responses to governors' recommendations for COVID-19 prevention in the United States. *Proceedings of the National Academy of Sciences*, 117(39), 24144–24153. <https://doi.org/10.1073/pnas.2007835117>
- Guess, A., & Coppock, A. (2020). Does Counter-Attitudinal Information Cause Backlash? Results from Three Large Survey Experiments. *British Journal of Political Science*, 50(4), 1497–1515. <https://doi.org/10.1017/S0007123418000327>
- Hancock, J. T., Naaman, M., & Levy, K. (2020). AI-Mediated Communication: Definition, Research Agenda, and Ethical Considerations. *Journal of Computer-Mediated Communication*, 25(1), 89–100. <https://doi.org/10.1093/jcmc/zmz022>
- Heller, J. F., Pallak, M. S., & Picek, J. M. (1973). The interactive effects of intent and threat on boomerang attitude change. *Journal of Personality and Social Psychology*, 26, 273–279. <https://doi.org/10.1037/h0034461>
- Hoeken, H., Hornikx, J., & Linders, Y. (2020). The Importance and Use of Normative Criteria to Manipulate Argument Quality. *Journal of Advertising*, 49(2), 195–201. <https://doi.org/10.1080/00913367.2019.1663317>
- Hoeken, H., & Hustinx, L. (2009). When is Statistical Evidence Superior to Anecdotal Evidence in Supporting Probability Claims? The Role of Argument Type. *Human Communication Research*, 35(4), 491–510. <https://doi.org/10.1111/j.1468-2958.2009.01360.x>
- Hornikx, J., & Best, J. de. (2011). Persuasive Evidence in India: An Investigation of the Impact of Evidence Types and Evidence Quality. *Argumentation and Advocacy*, 47(4), 246–257. <https://doi.org/10.1080/00028533.2011.11821750>

- Hornikx, J., & Hoeken, H. (2007). Cultural Differences in the Persuasiveness of Evidence Types and Evidence Quality. *Communication Monographs*, 74(4), 443–463.  
<https://doi.org/10.1080/03637750701716578>
- Huang, G., & Wang, S. (2023). Is artificial intelligence more persuasive than humans? A meta-analysis. *Journal of Communication*, jqad024.  
<https://doi.org/10.1093/joc/jqad024>
- Huber, R. A., Greussing, Esther, & Eberl, J.-M. (2022). From populism to climate scepticism: The role of institutional trust and attitudes towards science. *Environmental Politics*, 31(7), 1115–1138.  
<https://doi.org/10.1080/09644016.2021.1978200>
- Jennings, F. J., & Russell, F. M. (2019). Civility, credibility, and health information: The impact of uncivil comments and source credibility on attitudes about vaccines. *Public Understanding of Science*, 28(4), 417–432.  
<https://doi.org/10.1177/0963662519837901>
- Johnson, K. A., & Wiedenbeck, S. (2009). Enhancing Perceived Credibility of Citizen Journalism Web Sites. *Journalism & Mass Communication Quarterly*, 86(2), 332–348. <https://doi.org/10.1177/107769900908600205>
- Juhl, S., & Hilpert, D. (2021). Wheeling and dealing behind closed doors: Estimating the causal effect of transparency on policy evaluations using a survey experiment. *Political Science Research and Methods*, 9(1), 36–52. Cambridge Core.  
<https://doi.org/10.1017/psrm.2018.67>

- Kang, H., & Lee, M. J. (2018). Designing Anti-Binge Drinking Prevention Messages: Message Framing vs. Evidence Type. *Health Communication, 33*(12), 1494–1502. <https://doi.org/10.1080/10410236.2017.1372046>
- Kang, Y., Cappella, J. N., & Fishbein, M. (2009). The Effect of Marijuana Scenes in Anti-Marijuana Public Service Announcements on Adolescents' Evaluation of Ad Effectiveness. *Health Communication, 24*(6), 483–493. <https://doi.org/10.1080/10410230903104269>
- Karinshak, E., Liu, S. X., Park, J. S., & Hancock, J. T. (2023). Working With AI to Persuade: Examining a Large Language Model's Ability to Generate Pro-Vaccination Messages. *Proc. ACM Hum.-Comput. Interact., 7*(CSCW1). <https://doi.org/10.1145/3579592>
- Kerr, J. R., & van der Linden, S. (2022). Communicating expert consensus increases personal support for COVID-19 mitigation policies. *Journal of Applied Social Psychology, 52*(1), 15–29. <https://doi.org/10.1111/jasp.12827>
- Kim, J. W., & Liu, R. (2024). Persuading climate skeptics with facts: Effects of causal evidence vs. consensus messaging. *Research & Politics, 11*(1), 20531680241237311. <https://doi.org/10.1177/20531680241237311>
- Kraft, P. W., Lodge, M., & Taber, C. S. (2015). Why People “Don’t Trust the Evidence”: Motivated Reasoning and Scientific Beliefs. *The ANNALS of the American Academy of Political and Social Science, 658*(1), 121–133. <https://doi.org/10.1177/0002716214554758>
- Kreuter, M. W., Green, M. C., Cappella, J. N., Slater, M. D., Wise, M. E., Storey, D., Clark, E. M., O’Keefe, D. J., Erwin, D. O., Holmes, K., Hinyard, L. J., Houston,

- T., & Woolley, S. (2007). Narrative communication in cancer prevention and control: A framework to guide research and application. *Annals of Behavioral Medicine*, 33(3), 221–235. <https://doi.org/10.1007/BF02879904>
- Kreuter, M. W., Holmes, K., Alcaraz, K., Kalesan, B., Rath, S., Richert, M., McQueen, A., Caito, N., Robinson, L., & Clark, E. M. (2010). Comparing narrative and informational videos to increase mammography in low-income African American women. *Patient Education and Counseling*, 81, S6–S14. <https://doi.org/10.1016/j.pec.2010.09.008>
- Kunda, Z. (1990). The case for motivated reasoning. *Psychological Bulletin*, 108(3), 480–498. <https://doi.org/10.1037/0033-2909.108.3.480>
- Lee, C.-J., Scheufele, D. A., & Lewenstein, B. V. (2005). Public Attitudes toward Emerging Technologies: Examining the Interactive Effects of Cognitions and Affect on Public Attitudes toward Nanotechnology. *Science Communication*, 27(2), 240–267. <https://doi.org/10.1177/1075547005281474>
- Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Bergquist, P., Ballew, M. T., Goldberg, M., & Gustafson, A. (2020). Climate change in the American mind: November 2019 (PPR327828). <https://doi.org/10.31234/osf.io/z3wtx>
- Lermann Henestrosa, A., Greving, H., & Kimmerle, J. (2023). Automated journalism: The effects of AI authorship and evaluative information on the perception of a science journalism article. *Computers in Human Behavior*, 138, 107445. <https://doi.org/10.1016/j.chb.2022.107445>

- Lewandowsky, S. (2021). Climate Change Disinformation and How to Combat It. *Annual Review of Public Health*, 42(1), 1–21. <https://doi.org/10.1146/annurev-publhealth-090419-102409>
- Liu, B., & Wei, L. (2018). Reading Machine-Written News: Effect of Machine Heuristic and Novelty on Hostile Media Perception. In M. Kurosu (Ed.), *Human-Computer Interaction. Theories, Methods, and Human Issues* (pp. 307–324). Springer International Publishing.
- Lu, L., Tormala, Z. L., & Duhachek, A. (2025). How AI sources can increase openness to opposing views. *Scientific Reports*, 15(1), 17170. <https://doi.org/10.1038/s41598-025-00791-z>
- Ma, Y., Dixon, G., & Hmielowski, J. D. (2019). Psychological Reactance From Reading Basic Facts on Climate Change: The Role of Prior Views and Political Identification. *Environmental Communication*, 13(1), 71–86. <https://doi.org/10.1080/17524032.2018.1548369>
- McCroskey, J. C. (1969). A summary of experimental research on the effects of evidence in persuasive communication. *Quarterly Journal of Speech*, 55(2), 169–176.
- Mede, N. G., Cologna, V., Berger, S., Besley, J., Brick, C., Joubert, M., Maibach, E. W., Mihelj, S., Oreskes, N., Schäfer, M. S., van der Linden, S., Abdul Aziz, N. I., Abdulsalam, S., Shamsi, N. A., Aczel, B., Adinugroho, I., Alabrese, E., Aldoh, A., Alfano, M., ... Zwaan, R. A. (2025). Perceptions of science, science communication, and climate change attitudes in 68 countries – the TISP dataset. *Scientific Data*, 12(1), 114. <https://doi.org/10.1038/s41597-024-04100-7>

- Miller, C. H., Lane, L. T., Deatrick, L. M., Young, A. M., & Potts, K. A. (2007). Psychological Reactance and Promotional Health Messages: The Effects of Controlling Language, Lexical Concreteness, and the Restoration of Freedom. *Human Communication Research*, 33(2), 219–240.  
<https://doi.org/10.1111/j.1468-2958.2007.00297.x>
- Muğaloğlu, E. Z., Kaymaz, Z., MısıR, M. E., & Laçın-Şimşek, C. (2022). Exploring the Role of Trust in Scientists to Explain Health-Related Behaviors in Response to the COVID-19 Pandemic. *Science & Education*, 31(5), 1281–1309.  
<https://doi.org/10.1007/s11191-022-00323-5>
- O’Keefe, D. J. (1997). Standpoint Explicitness and Persuasive Effect: A Meta-Analytic Review of the Effects of Varying Conclusion Articulation in Persuasive Messages. *Argumentation and Advocacy*, 34(1), 1–12.  
<https://doi.org/10.1080/00028533.1997.11978023>
- O’Keefe, D. J. (1998). Justification Explicitness and Persuasive Effect: A Meta-Analytic Review of the Effects of Varying Support Articulation in Persuasive Messages. *Argumentation and Advocacy*, 35(2), 61–75.  
<https://doi.org/10.1080/00028533.1998.11951621>
- O’Keefe, D. J. (2003). Message Properties, Mediating States, and Manipulation Checks: Claims, Evidence, and Data Analysis in Experimental Persuasive Message Effects Research. *Communication Theory*, 13(3), 251–274.  
<https://doi.org/10.1111/j.1468-2885.2003.tb00292.x>
- O’Keefe, D. J. (2016). *Persuasion: Theory and research*. Sage Publications.

- O’Keefe, D. J., & Hoeken, H. (2021). Message Design Choices Don’t Make Much Difference to Persuasiveness and Can’t Be Counted On—Not Even When Moderating Conditions Are Specified. *Frontiers in Psychology*, 12. <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.664160>
- O’Keefe, D. J., & Jackson, S. (1995). Argument quality and persuasive effects: A review of current approaches. 88–92.
- Osborne, M. R., & Bailey, E. R. (2025). Me vs. the machine? Subjective evaluations of human- and AI-generated advice. *Scientific Reports*, 15(1), 3980. <https://doi.org/10.1038/s41598-025-86623-6>
- Pasek, J. (2018). It’s not my consensus: Motivated reasoning and the sources of scientific illiteracy. *Public Understanding of Science*, 27(7), 787–806. <https://doi.org/10.1177/0963662517733681>
- Peifer, J. T., & Meisinger, J. (2021). The Value of Explaining the Process: How Journalistic Transparency and Perceptions of News Media Importance Can (Sometimes) Foster Message Credibility and Engagement Intentions. *Journalism & Mass Communication Quarterly*, 98(3), 828–853. <https://doi.org/10.1177/10776990211012953>
- 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>
- Petty, R. E., & Cacioppo, J. T. (1981). *Attitudes and Persuasion: Classic and Contemporary Approaches*. Routledge. <https://doi.org/10.4324/9780429502156>

- Petty, R. E., & Cacioppo, J. T. (1984). Source Factors and the Elaboration Likelihood Model of Persuasion. *ACR North American Advances*, NA-11.  
<https://www.acrwebsite.org/volumes/6328/volumes/v11/NA-11/full>
- Petty, R. E., & Cacioppo, J. T. (1986). The Elaboration Likelihood Model of Persuasion. In R. E. Petty & J. T. Cacioppo (Eds.), *Communication and Persuasion: Central and Peripheral Routes to Attitude Change* (pp. 1–24). Springer.  
[https://doi.org/10.1007/978-1-4612-4964-1\\_1](https://doi.org/10.1007/978-1-4612-4964-1_1)
- Pew Research Center. (2017, July 10). Sharp Partisan Divisions in Views of National Institutions. Pew Research Center.  
<https://www.pewresearch.org/politics/2017/07/10/sharp-partisan-divisions-in-views-of-national-institutions/>
- Pornpitakpan, C. (2004). The Persuasiveness of Source Credibility: A Critical Review of Five Decades' Evidence. *Journal of Applied Social Psychology*, 34(2), 243–281.  
<https://doi.org/10.1111/j.1559-1816.2004.tb02547.x>
- Preist, S. H. (2001). Misplaced Faith: Communication Variables as Predictors of Encouragement for Biotechnology Development. *Science Communication*, 23(2), 97–110. <https://doi.org/10.1177/1075547001023002002>
- Quick, B. L., Scott, A. M., & Ledbetter, A. M. (2011). A Close Examination of Trait Reactance and Issue Involvement as Moderators of Psychological Reactance Theory. *Journal of Health Communication*, 16(6), 660–679.  
<https://doi.org/10.1080/10810730.2011.551989>
- Rainie, L., & Perrin, A. (2019, July 22). Key findings about Americans' declining trust in government and each other. Pew Research Center.

<https://www.pewresearch.org/short-reads/2019/07/22/key-findings-about-americans-declining-trust-in-government-and-each-other/>

Raphael, C., & Karpowitz, C. F. (2013). Good Publicity: The Legitimacy of Public Communication of Deliberation. *Political Communication*, 30(1), 17–41.

<https://doi.org/10.1080/10584609.2012.737412>

Revers, M. (2014). The Twitterization of News Making: Transparency and Journalistic Professionalism. *Journal of Communication*, 64(5), 806–826.

<https://doi.org/10.1111/jcom.12111>

Rode, J. B., Dent, A. L., & Ditto, P. H. (2023). Climate Change Consensus Messages May Cause Reactance in Conservatives, But There is No Meta-Analytic Evidence That They Backfire. *Environmental Communication*, 17(1), 60–66.

<https://doi.org/10.1080/17524032.2022.2101501>

Rose, K. M., Markowitz, E. M., & Brossard, D. (2020). Scientists' incentives and attitudes toward public communication. *Proceedings of the National Academy of Sciences*, 117(3), 1274–1276. <https://doi.org/10.1073/pnas.1916740117>

Salvi, F., Ribeiro, M. H., Gallotti, R., & West, R. (2024). On the Conversational Persuasiveness of Large Language Models: A Randomized Controlled Trial.

<https://arxiv.org/abs/2403.14380>

Schellens, P. J., Šorm, E., Timmers, R., & Hoeken, H. (2017). Laypeople's Evaluation of Arguments: Are Criteria for Argument Quality Scheme-Specific? *Argumentation*, 31(4), 681–703. <https://doi.org/10.1007/s10503-016-9418-2>

- Sherkat, D. E. (2011). Religion and Scientific Literacy in the United States. *Social Science Quarterly*, 92(5), 1134–1150. <https://doi.org/10.1111/j.1540-6237.2011.00811.x>
- Siegrist, M. (2000). The Influence of Trust and Perceptions of Risks and Benefits on the Acceptance of Gene Technology. *Risk Analysis*, 20(2), 195–204. <https://doi.org/10.1111/0272-4332.202020>
- Sonmez, B., Makarovs, K., & Allum, N. (2023). Public perception of scientists: Experimental evidence on the role of sociodemographic, partisan, and professional characteristics. *PLOS ONE*, 18(7), e0287572. <https://doi.org/10.1371/journal.pone.0287572>
- Sun, Y., Chen, J., & Sundar, S. S. (2024). Chatbot ads with a human touch: A test of anthropomorphism, interactivity, and narrativity. *Journal of Business Research*, 172, 114403. <https://doi.org/10.1016/j.jbusres.2023.114403>
- Sundar, S. S. (2008). The MAIN model: A heuristic approach to understanding technology effects on credibility. In M. J. Metzger & A. J. Flanagin (Eds.), *Digital Media, Youth, and Credibility* (pp. 73–100). The MIT Press.
- Sundar, S. S. (2020). Rise of Machine Agency: A Framework for Studying the Psychology of Human–AI Interaction (HAI). *Journal of Computer-Mediated Communication*, 25(1), 74–88. <https://doi.org/10.1093/jcmc/zmz026>
- Sundar, S. S., & Kim, J. (2019). Machine Heuristic: When We Trust Computers More than Humans with Our Personal Information. *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, 1–9. <https://doi.org/10.1145/3290605.3300768>

- Sundar, S. S., & Lee, E.-J. (2022). Rethinking Communication in the Era of Artificial Intelligence. *Human Communication Research*, 48(3), 379–385.  
<https://doi.org/10.1093/hcr/hqac014>
- Taber, C. S., Cann, D., & Kucsova, S. (2009). The Motivated Processing of Political Arguments. *Political Behavior*, 31(2), 137–155. <https://doi.org/10.1007/s11109-008-9075-8>
- Taber, C. S., & Lodge, M. (2006). Motivated Skepticism in the Evaluation of Political Beliefs. *American Journal of Political Science*, 50(3), 755–769.  
<https://doi.org/10.1111/j.1540-5907.2006.00214.x>
- van der Linden, S. L., Clarke, C. E., & Maibach, E. W. (2015). Highlighting consensus among medical scientists increases public support for vaccines: Evidence from a randomized experiment. *BMC Public Health*, 15(1), 1207.  
<https://doi.org/10.1186/s12889-015-2541-4>
- van der Linden, S., Leiserowitz, A., & Maibach, E. (2019). The gateway belief model: A large-scale replication. *Journal of Environmental Psychology*, 62, 49–58.  
<https://doi.org/10.1016/j.jenvp.2019.01.009>
- van Stekelenburg, A., Schaap, G., Veling, H., van 't Riet, J., & Buijzen, M. (2022). Scientific-Consensus Communication About Contested Science: A Preregistered Meta-Analysis. *Psychological Science*, 33(12), 1989–2008.  
<https://doi.org/10.1177/09567976221083219>
- Vorm, E. S., & Combs, D. J. Y. (2022). Integrating Transparency, Trust, and Acceptance: The Intelligent Systems Technology Acceptance Model (ISTAM). *International*

- Journal of Human–Computer Interaction, 38(18–20), 1828–1845.  
<https://doi.org/10.1080/10447318.2022.2070107>
- Waddell, T. F. (2018). A Robot Wrote This? Digital Journalism, 6(2), 236–255.  
<https://doi.org/10.1080/21670811.2017.1384319>
- Wölker, A., & Powell, T. E. (2021). Algorithms in the newsroom? News readers’ perceived credibility and selection of automated journalism. Journalism, 22(1), 86–103. <https://doi.org/10.1177/1464884918757072>
- Wood, T., & Porter, E. (2019). The Elusive Backfire Effect: Mass Attitudes’ Steadfast Factual Adherence. Political Behavior, 41(1), 135–163.  
<https://doi.org/10.1007/s11109-018-9443-y>
- Yan, C., Dillard, J. P., & Shen, F. (2012). Emotion, Motivation, and the Persuasive Effects of Message Framing. Journal of Communication, 62(4), 682–700.  
<https://doi.org/10.1111/j.1460-2466.2012.01655.x>
- Yang, H., & Sundar, S. S. (2024). Machine heuristic: Concept explication and development of a measurement scale. Journal of Computer-Mediated Communication, 29(6), zmae019. <https://doi.org/10.1093/jcmc/zmae019>
- Yzer, M. C., Vohs, K. D., Luciana, M., Cuthbert, B. N., & MacDonald, A. W. (2011). Affective Antecedents of the Perceived Effectiveness of Antidrug Advertisements: An Analysis of Adolescents’ Momentary and Retrospective Evaluations. Prevention Science, 12(3), 278–288. <https://doi.org/10.1007/s11121-011-0212-y>
- Zebregs, S., van den Putte, B., Neijens, P., & de Graaf, A. (2015). The Differential Impact of Statistical and Narrative Evidence on Beliefs, Attitude, and Intention: A

Meta-Analysis. *Health Communication*, 30(3), 282–289.

<https://doi.org/10.1080/10410236.2013.842528>

Zhang, Y., & Gosline, R. (2023a). Human favoritism, not AI aversion: People's perceptions (and bias) toward generative AI, human experts, and human–GAI collaboration in persuasive content generation. *Judgment and Decision Making*, 18, e41. Cambridge Core. <https://doi.org/10.1017/jdm.2023.37>

Zhang, Y., & Gosline, R. (2023b). Human favoritism, not AI aversion: People's perceptions (and bias) toward generative AI, human experts, and human–GAI collaboration in persuasive content generation. *Judgment and Decision Making*, 18, e41. Cambridge Core. <https://doi.org/10.1017/jdm.2023.37>

Zhou, A., Liu, W., & Yang, A. (2023). Politicization of Science in COVID-19 Vaccine Communication: Comparing US Politicians, Medical Experts, and Government Agencies. *Political Communication*, 1–23.

<https://doi.org/10.1080/10584609.2023.2201184>

## VITA

Go-Eun Kim, originally from South Korea, earned her Ph.D. in Communication from the University of Missouri. Her research focuses on political and intergroup communication, with particular emphasis on persuasive messaging and strategic communication aimed at fostering cooperation and mitigating conflict rooted in political and social identities.