

RESEARCH ARTICLE OPEN ACCESS

Post With Care: How Language Use Influences the Effectiveness of CEOs' Climate-Related Messages on Social Media

Ellen Weber¹  | Marah Blaurock²  | Kristof Coussement³  | Irini Tsaga¹ | Marion Büttgen¹ 

¹University of Hohenheim, Stuttgart, Germany | ²Ingolstadt School of Management, Catholic University of Eichstätt-Ingolstadt, Eichstätt, Germany | ³IESEG School of Management, Univ. Lille, CNRS, UMR 9221 - LEM- Lille Economie Management, Lille, France

Correspondence: Ellen Weber (e.weber@uni-hohenheim.de)

Received: 24 November 2025 | **Revised:** 20 July 2026 | **Accepted:** 20 August 2026

Keywords: CEO | climate | communication | engagement | schema-congruity theory | social media

ABSTRACT

Chief executive officers (CEOs) play a pivotal role in shaping public discourse on climate change through social media, yet how their language use affects the effectiveness of climate-related posts remains unclear. Drawing on schema-congruity theory and leader role expectations, we conceptualize certainty in language as congruent and anxiety as incongruent CEO language. Using automated text analysis of 5544 posts on X by 50 CEOs of Global *Fortune* 500 companies, we examine how (in)congruent language use influences public engagement and how climate content moderates these effects. A follow-up experiment ($N = 119$) investigates strategically important downstream effects (e.g., willingness to invest in the CEO's company) via heightened attention. Results show that congruent language (i.e., certainty) generally increases public engagement while incongruent language (i.e., anxiety) reduces it, yet in climate posts, anxiety can become congruent and exert positive effects, underscoring the critical role of content. Findings offer guidance for effective sustainability messaging.

1 | Introduction

Chief executive officers (CEOs) exert substantial influence on corporate sustainability agendas and shape public discourse on climate change through their statements and actions (Arvidsson and Sabelfeld 2023). Their social media communication signals strategic priorities, shapes corporate reputation, and aligns diverse stakeholders with companies' strategic goals (Conte et al. 2017; Craig and Amernic 2020; Matthews et al. 2022). As stakeholders increasingly expect transparent communication on climate-related views and actions (Dang et al. 2026; Zechiel et al. 2024), social media has emerged as a key arena for CEOs to reach wide audiences, impact public perceptions, and strategically position the company through strategic signaling (Connelly et al. 2025; Iliopoulou et al. 2024).

Research on social media communication emphasizes that corporate leaders are generally expected to act and communicate in ways consistent with their professional role (Matthews et al. 2022; Um et al. 2022). For CEOs, decisiveness is the most defining trait associated with success, whereas anxiety or fear are linked to negative evaluations (Ryan et al. 2011), making certain language congruent with the CEO role. However, it remains unclear whether certainty in language consistently strengthens such perceptions or whether, in complex, sensitive, and unsettling societal contexts, anxiety in language might instead be regarded as appropriate and engaging. Climate change, in particular, is a topic where public uncertainty and controversy are already high (Brehm and Gruhl 2024).

Schema-congruity theory (Mandler 1982) provides a framework for understanding these dynamics, positing that individuals

This is an open access article under the terms of the [Creative Commons Attribution](https://creativecommons.org/licenses/by/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2026 The Author(s). *Business Strategy and the Environment* published by ERP Environment and John Wiley & Sons Ltd.

evaluate stimuli based on the fit between observed behavior and role-related expectations. While extensively applied in product and brand marketing (e.g., Gerrath and Biraglia 2021), its application in the context of CEO communication on social media has been limited (Wu et al. 2025). Furthermore, prior research has rarely examined how specific content domains, such as climate-related topics, interact with congruity effects. Moreover, existing studies (e.g., Iliopoulou et al. 2024) have primarily focused on how corporate climate communication is perceived, while little is known about the underlying psychological mechanisms through which CEO communication elicits audience responses. Specifically, research has yet to explain how (in)congruent climate-related CEO communication shapes public engagement on social media and which downstream consequences strategically relevant to companies, such as company-related word of mouth (WOM) and willingness to invest in the company, arise. This study addresses these gaps by formulating two research questions:

RQ1. How does (in)congruity in CEOs' language use (i.e., certainty and anxiety) on social media influence public engagement?

RQ2. How does climate-related content shape the impact of (in)congruity in CEOs' language use (i.e., certainty and anxiety) on public engagement, and what are downstream effects on social and financial firm performance (i.e., WOM and investment intention)?

To answer these questions, we conduct an automated text analysis of 5544 posts on X (formerly Twitter) by 50 CEOs of Global *Fortune* 500 companies, using Linguistic Inquiry and Word Count (LIWC) and human coders to annotate climate-relatedness. To account for posts being nested within CEOs, we apply hierarchical linear modeling (HLM). A complementary scenario-based experiment further examines the impact of different language use (i.e., certainty and anxiety) in climate-related CEO posts on recipients' public engagement, the underlying mechanisms, and strategically relevant downstream consequences.

Our study contributes to three research streams: the strategic use of CEO social media communication, schema-(in)congruity in digital communication, and corporate climate communication. First, we extend schema-congruity theory to CEO social media communication, moving beyond descriptive accounts of linguistic features toward a theoretical explanation of why specific language engages audiences and others do not. Whereas prior research has debated whether congruent or incongruent communication is more effective in attracting attention and public engagement (e.g., Schanke et al. 2024; Wu et al. 2025), we introduce schema congruity as a theoretical lens for understanding how the audience evaluates CEO language use on social media. In doing so, we provide a more explanatory perspective on audience reactions to CEO communication, showing that certainty, as congruent CEO language, is positively associated with public engagement, whereas anxiety, as incongruent CEO language, is negatively so.

Second, we identify climate-related content as a boundary condition for schema-congruity effects. While prior research has

examined corporate climate communication more broadly (e.g., Chu et al. 2020), little is known about how climate-related topics shape the effectiveness of CEO communication. Our findings suggest that the effectiveness of congruent and incongruent language depends on the communication context in which it is embedded. Specifically, climate-related communication alters audience expectations and changes how CEO language is evaluated. We show that the positive association of certainty in language weakens and the negative association of anxiety in language reverses, so that anxiety, as inherent incongruent CEO language, becomes an effective strategy when CEOs address climate issues. Thus, by demonstrating that congruity emerges from the interaction between communicator role expectations and topic context rather than from role expectations alone, we advance schema-congruity theory toward a more context-sensitive perspective and help reconcile conflicting findings (e.g., Berger and Packard 2018; Schanke et al. 2024; Tracy et al. 2021; Wu et al. 2025) regarding the effectiveness of congruent versus incongruent communication.

Third, we advance schema-congruity theory by uncovering the psychological process behind these effects. Drawing on insights from processing fluency theory (Reber et al. 2004), we identify attention as the mechanism linking schema-(in)congruent CEO communication to public engagement and to outcomes beyond the platform, including company-related WOM and investment intention. By explaining how these effects emerge rather than only documenting whether they occur, we extend schema-congruity research from a predominantly outcome-oriented perspective toward a more process-oriented understanding of audience responses. Taken together, these contributions position CEO climate communication as a strategic resource for navigating audience expectations and companies' positioning in sustainability debates.

The remainder of the paper is structured as follows. The following section introduces the theoretical background and reviews relevant literature. Section 3 develops hypotheses. Section 4 describes the automated text analysis of CEO posts on X and reports the HLM results. Section 5 presents the scenario-based experiment and its findings. Section 6 discusses the theoretical and managerial implications and concludes with limitations and directions for future research.

2 | Theoretical Background and Literature Review

2.1 | CEOs' Strategic Signaling in Social Media Communication

CEOs' social media activities go beyond simply exchanging information; they form a strategic practice essential to shaping the company's position and long-term reputation (Craig and Amernic 2020). These platforms enable CEOs to bypass traditional intermediaries, directly communicate with customers, employees, investors, policymakers, and the broader public (Craig and Amernic 2020), as well as engage in digital activism (Hamelberg et al. 2025). By doing so, CEOs not only enhance personal branding but also shape organizational narratives and drive public engagement (Matthews et al. 2022).

From a strategic perspective, CEOs' social media communication serves several distinct functions rooted in signaling theory, which posits that communicators use observable cues to convey credible information about otherwise hidden attributes, thereby reducing information asymmetry between sender and audience (Matthews et al. 2022). On social media, CEOs leverage this logic deliberately: By publicly addressing issues such as climate change, they signal to diverse stakeholder groups that the company is aware of and responsive to pressing societal challenges. Externally, it positions the CEO and the company as informed and responsible actors in the climate debate, raising public awareness and differentiating the organization within broader sustainability discourse (Baskoro et al. 2024; N. Yang et al. 2024), leading to more favorable recipient assessments that extend beyond social media to a company's social and financial performance (Liu et al. 2023). Internally, it aligns employees and partners with the company's strategic priorities, increasing operational and innovation performance (Andreu et al. 2025; Liu et al. 2023). Corporate communication is therefore not merely rhetorical but closely tied to strategic positioning. However, to be effective, CEO communication should consider recipient perceptions of tone and stimuli (Dang et al. 2026), which schema-congruity theory (Mandler 1982) posits are contingent upon the perceived congruence or incongruence of the content in the posts.

2.2 | Schema-Congruity Theory

Schema-congruity theory (Mandler 1982) posits that individuals evaluate stimuli by comparing incoming information against pre-existing mental structures, or schemas, that encode expectations about how people, objects, and situations typically behave. When new information matches an existing schema, it generates familiarity and comfort without requiring significant cognitive effort. Conversely, when information deviates from schema-based expectations, it triggers heightened cognitive elaboration as individuals attempt to resolve the perceived mismatch (Mandler 1982). Thus, greater congruity tends to produce more positive evaluations (Meyers-Levy and Tybout 1989; Gao et al. 2022). This trajectory in the literature converges with processing fluency theory (Reber et al. 2004), which holds that stimuli processed with greater ease are experienced more positively. Together, these frameworks predict that congruent communication is processed more fluently and readily encoded and thus not only evaluated more positively but also more likely to evoke attention and engagement (Labroo and Lee 2006; Wu et al. 2025).

2.3 | (In)congruity and Content Effects in CEO Social Media Communication

Schema-congruity theory applied to CEO social media communication suggests that a CEO's behavior is evaluated against the CEO role schema, a widely shared set of expectations regarding the traits, behaviors, and communication befitting a corporate leader (Matthews et al. 2022; Um et al. 2022). Central to this schema is decisiveness, identified as

a defining trait of leadership success, whereas expressions of anxiety or fear are associated with negative evaluations (Ryan et al. 2011). Decisiveness can manifest through certainty in language, reflected in markers such as "I know that ..." or "for sure" (Lorson et al. 2021), making certain language a schema-congruent signal of leaders' role-appropriate behavior. When a CEO's language aligns with these expectations, audiences process the communication with relative ease, consistent with processing fluency theory (Reber et al. 2004; N. Yang et al. 2024); this alignment affirms role-appropriate identity, reinforcing attention and favorable evaluation. Conversely, anxiety in language creates incongruity that increases cognitive effort and weakens the credibility signals associated with effective leadership. On social media, where audiences make rapid judgments across large volumes of content, the cognitive accessibility of congruent communication is especially important (Miller et al. 2024). Although schema-congruity theory in alignment with processing fluency theory suggests incongruent information is often dismissed (Mandler 1982), the literature remains divided on whether messages should evoke congruence or incongruence to foster public engagement. For example, Tracy et al. (2021) show that online messages grounded in social norms (i.e., congruence) have the highest click rates in a recruitment context, whereas atypical and unexpected content (Berger and Packard 2018) and incongruity in posts (Schanke et al. 2024) can instead be preferred and lead to greater public engagement.

Few studies specifically examine CEOs' (in)congruent communication behavior on social media and content-specific effects impacting CEO communication. For instance, Wu et al. (2025) reveal that for female CEOs, work-related content elicits higher public engagement than life-related content; in contrast, the effect is reversed for male CEOs. These outcomes appear to stem from the incongruity between stereotypical gender roles and content orientation, which heightens perceived novelty and audience interest, ultimately leading to increased public engagement. In terms of content-specific effects, Cabano et al. (2024) examine how the controversy of CEO posts affects public engagement and find that recipients respond more to noncontroversial than to controversial content. They attribute this pattern to customers' fear of social rejection, which discourages public engagement with contentious topics. Moreover, Hamelberg et al. (2025) analyze CEO communication on X during the Russia-Ukraine war, highlighting the importance of aligning content in terms of message framing (self vs. other) and message appeal (informational vs. emotional) in crisis contexts. While not focusing on sustainability issues, these studies underscore that content matters when investigating CEO language use and its effects on public engagement and downstream consequences.

2.4 | Climate-Related Content on Social Media

Existing research has concentrated on how companies communicate about climate change on social media and its impact on both companies and individual outcomes. For example, extant work shows that energy companies strategically communicate about climate change on X, framing sustainability

as a shared responsibility by using positive, future-oriented, and collaborative language (Paliwoda-Matiolańska and Nakayama 2024). Iliopoulou et al. (2024) show that when green communication of agricultural companies is perceived as credible and detailed, more critical, information-seeking recipients engage with the content. Moreover, extant work reveals the importance of aspirational talk (i.e., positive, future-oriented narratives) in companies' CSR communication to engage recipients on X (Araujo and Kollat 2018). Finally, Alnawas et al. (2024) show that informative and engaging sustainability communication strategies are equally important to drive public engagement.

While these studies provide important insights into corporate social media communication on climate-related issues, few specifically address CEO language use in this context. Grover et al. (2019) find that social influencer CEOs build substantially more social capital through public engagement on X than Fortune CEOs when posting about Sustainable Development Goals (SDGs), yet they do not examine how or why these CEOs are more successful in evoking public engagement and explicitly call for a deeper investigation of language use. The downstream effects of strategic language use in the climate context are likewise often neglected. Recent work has examined downstream effects of CEO social media communication on financial performance, such as stock market performance (Ahmed and Saxton 2025; Qureshi 2024) and willingness to invest (Rennekamp and Witz 2021), and on social performance, such as brand attitudes (Kim et al. 2025) and CEO likability (Yue et al. 2021), but it typically isolates a single performance category and overlooks content effects. Similarly, studies that account for CEO attributes such as gender (Yue et al. 2021), perceived activism, self-disclosure, or political identity (Kim et al. 2025), or for changed conditions such as crises (Yadav et al. 2024), say little about how content itself shapes performance outcomes. How CEOs can communicate effectively about climate change to improve performance, therefore, remains largely unexamined. Early evidence indicates that greater controversy in tweets harms stock market performance (Ahmed and Saxton 2025), yet how to frame messages on contested issues such as climate change to mitigate or even reverse these negative effects is still unknown.

In summary, three research streams inform our study: (1) strategy-oriented perspectives on CEOs' social media use, (2) work on (in)congruity in social media communication, and (3) climate-related content on social media. Each offers important insight within its own domain, yet each also leaves a specific question open. The strategy stream establishes that CEO communication is strategically important but says little about which linguistic choices are crucial in this context. The (in)congruity stream shows that both congruent and incongruent messages can drive public engagement but does not establish when each prevails. The climate stream documents how companies communicate about climate change but rarely isolates CEOs' language use or traces its effects beyond the platform. Their intersection, namely, how CEOs' (in)congruent language use in climate-related content shapes public engagement and downstream outcomes beyond social media, such as company-related WOM and investment intentions, remains underexplored. Our study addresses this gap.

3 | Hypothesis Development

3.1 | The Impact of CEOs' (In)congruent Social Media Posts on Public Engagement

The most common characteristic of a CEO, as described by the public, is decisiveness (Ryan et al. 2011), which involves being certain about the course of action (Mulki et al. 2012). Pollock et al. (2024) show that A-list celebrity CEOs use more concrete and certain language, suggesting they are more likely to make specific statements. Thus, we assume that CEOs' language use that reflects certainty is perceived as congruent with the expectations toward the CEO role. It is characterized by clear, decisive, and assertive language, fostering a sense of confidence among audiences (de Vries et al. 2010). In this context, Pezzuti et al. (2021) reveal that messages that express certainty, posted on Facebook and X, are linked to higher levels of public engagement. They argue that such language resonates more effectively with social media recipients, as the senders of such messages are viewed as more powerful. Moreover, certainty or assertiveness in language often attracts more attention by offering recipients clear behavioral recommendations (Deng et al. 2025). Building on schema-congruity theory (Mandler 1982) and recent research (e.g., Pezzuti et al. 2021) on certainty in language use, we hypothesize:

H1. *CEOs' congruent language use (i.e., certainty) on social media is positively related to public engagement.*

In contrast to certainty in language, an incongruent characteristic of a CEO, as described by the public and a counterpart to decisiveness, is being fearful or anxious (Ryan et al. 2011). CEOs are instead expected to embrace positivity and use uplifting language (Pollock et al. 2024). Leaders who show uncertainty are seen as less effective, less warm, and less competent (Alzahawi and Flynn 2025). Therefore, we assume that anxiety in language (specifically, expressing fear and anxiety) is not aligned with the expectations toward a CEO's role and is, thus, perceived as incongruent. Building on schema-congruity theory (Mandler 1982) and recent studies (e.g., Pollock et al. 2024), we propose that CEOs utilizing anxiety in language may generate less public engagement. Therefore, we hypothesize:

H2. *CEOs' incongruent language use (i.e., anxiety) is negatively related to public engagement.*

3.2 | The Impact of CEOs' Climate-Related Content on Public Engagement

Communication about the climate crisis has become increasingly polarized and emotionally charged, evoking negative feelings such as shame and guilt as well as positive ones such as hope and compassion (Falkenberg et al. 2022; Neckel and Hasenfratz 2021). Although the science behind the climate crisis is far from controversial, the societal debate is (Falkenberg et al. 2022). Thus, recipients frequently perceive such debates as sensitive, overwhelming, skeptical, or controversial (Cho et al. 2017). Yuan and Lu (2020) note that climate debates have intensified, with communicators adopting forceful language that condemns skeptics and opponents

of proenvironmental policy. Such exchanges have accordingly been characterized as antagonistic and uncivil (Treen et al. 2022). Positioning oneself on topics (e.g., through posting personal content or by public engagement) personalizes the discussion and gives the public insight into a recipient's personal views (Bennett 2012). Research has shown that users are more cautious about positioning themselves on controversial topics, leading to less public engagement (Cabano et al. 2024). Thus, we assume that when CEOs communicate about the climate crisis on social media, recipients generally engage less with respective posts due to their own public positioning, combined with the topic's controversial nature. We thus hypothesize:

H3. *CEOs' climate-related content is negatively related to public engagement.*

3.3 | The Interactive Effect of CEOs' (In)congruent Language Use and Climate-Related Content

3.3.1 | CEOs' Congruent Language in the Climate Context

We have argued that certainty in CEOs' language can raise public engagement on social media. Climate content, however, tends to depress engagement (Cho et al. 2017), as the debate itself is polarized, with audiences differing on the issue's importance or reporting crisis and topic fatigue (Fariello and Jemielniak 2025). Kronrod et al. (2012) find that certainty in advertising slogans is less effective at mobilizing individuals who do not regard climate change as important; rather, such appeals may instead weaken attitudes toward the organization and reinforce low environmental concern (Milfeld and Pittman 2024). Therefore, research (e.g., Kronrod et al. 2012) suggests that certainty of environmental messages should be toned down. As CEOs might have an audience with diverse views on climate-related topics, conveying certainty in their language might be less suitable. Moreover, while recipients might perceive CEOs' certainty in language as congruent with their CEO role, in the climate context, it may also be perceived as controlling (Milfeld and Pittman 2024), overly prescriptive, or authoritative, making them feel like they are being "lectured" from a position of power. This perception could lead to resistance or decreased public engagement. Therefore, we hypothesize:

H4. *CEOs' congruent language use (i.e., certainty) interacts with climate-related content, such that the positive effect of certainty on public engagement is reduced when CEOs' posts are climate related.*

3.3.2 | CEOs' Incongruent Language in the Climate Context

When CEOs use language in an unexpected or incongruent way—such as expressing anxiety instead of certainty—public engagement might decline, and we therefore assume that anxiety in language generally has an adverse effect on public engagement. However, climate content might change what counts as expected. Fear appeals are broadly effective (Tannenbaum et al. 2015) and fear representations can capture public attention on climate change in particular (O'Neill and Nicholson-Cole 2009). Because climate-related topics already evoke

uncertainty, fear, and concern (Brehm and Gruhl 2024; Loureiro and Alló 2020), anxiety in a CEO message could reflect these emotions, thus fitting the topic it addresses and allowing it to be processed more fluently (Reber et al. 2004). Accordingly, anxiety in language then appears appropriate when public concerns are acknowledged; thus, audiences might feel validated in their worries, are less hesitant to engage with a controversial issue, and assess the company more favorably. Thus, we argue that anxiety in language, when embedded in climate-related content, can mitigate its negative impact. Therefore, we hypothesize:

H5. *CEOs' incongruent language use (i.e., anxiety) interacts with climate-related content, such that the negative effect of anxiety on public engagement is reduced when CEOs' posts are climate related.*

3.3.3 | Downstream Effects and Mechanism of the Interaction Effect

While public engagement matters for CEOs, strategic signaling aims beyond social media and ultimately affects company performance (Liu et al. 2023). From a signaling theory perspective, CEO climate-related communication conveys observable signals about the CEO's and the company's sustainability orientation under conditions of information asymmetry (Connelly et al. 2025). Building on Liu et al.'s (2023) firm performance systematization, we examine outcomes that capture both social and financial reactions. Company-related WOM serves as a social indicator, reflecting whether the audience, including different stakeholders, perceives the signal and thus the company as worthy of endorsement and transmission within their networks. Willingness to invest serves as an economic indicator. Potential investors decide under uncertainty and rely on external signals to evaluate firm quality, so their willingness captures whether the communication is read as a credible cue of organizational quality and future economic potential. As outlined in H5, we argue that anxiety in language, although incongruent with conventional CEO role expectations, is congruent with the threatening nature of climate-related content, and this fit improves processing fluency, leading to more favorable evaluations (Connelly et al. 2025; M. Spence 1973). Following Wu et al. (2025), we model attention as the mediator channeling this benefit: Anxiety in language interacting with climate-related content increases recipients' attention, which in turn raises not only public engagement but also outcomes beyond social media, namely, company-related WOM and investment intentions. We hypothesize:

H6. *The interaction effect of CEOs' incongruent (i.e., anxiety) vs. congruent (i.e., certainty) language use with climate-related content has a positive effect on recipients' attention, which in turn increases (a) public engagement, (b) company-related WOM, and (c) investment intentions.*

4 | Study 1

4.1 | Research Setting

To test our hypotheses about the association between certainty and anxiety in language and public engagement, and how this association differs for climate-related posts, we identified 50

TABLE 1 | Sample summary statistics.

Variables	Mean	SD	Min.	Max.
Gender (male) ^a	85.70%			
Age	57.08	5.58	42	71
Tenure (in years)	7.07	5.00	1.5	22
Number of posts	1240.33	1302.78	65	5248
Number of followers	523,474.31	2,208,524.17	0	14,400,000
Environmental ESG score	73.90	16.98	4	97
Industry ^a				
Manufacturing	44.90%			
Financial and insurance activities	12.20%			
Information and communication	14.30%			
Electricity, gas, steam, and air conditioning supply	8.20%			
Arts, entertainment, and recreation	4.10%			
Transportation and storage	4.10%			
Mining and quarrying	2.00%			
Professional scientific and technical activities	2.00%			
Water supply, sewerage, waste management, and remediation activities	2.00%			

^aBinary variables taking values 1 or 0. These numbers represent percentages of appearances.

CEOs of Global *Fortune* 500 companies who are publicly visible through an active X (formerly Twitter) account, authored original posts, and published posts in English. For each CEO, we collected their X posts and the number of shares (also known as retweets) during their tenure at the company through the Pro X API provided in the Developer Portal of X. The entire time-frame for data collection spans from January 1, 2022, to April 19, 2024. On average, a CEO published 23 posts per tenure year. At the time of data collection, we manually gathered the CEO's gender, age, number of past posts, number of followers, tenure, the company's environmental ESG score, as collected through LSEG (<https://www.lseg.com/en/data-analytics/sustainable-finance/esg-scores>), and the company's industry. Table 1 outlines our sample characteristics (i.e., mean, standard deviation, minimum, and maximum values).

4.2 | Data and Measures

4.2.1 | Independent Variables of Interest

To operationalize certainty and anxiety in language expressed in the CEO's posts, we employ LIWC (<http://www.liwc.app/>) (Boyd et al. 2022), an automated, dictionary-based text analysis tool that matches tokens to precategorized word lists and returns the percentage of words in each category. Because the dictionary is predefined, no additional training is required to apply linguistic markers to our data. The validity and reliability of LIWC have been demonstrated repeatedly, with strong correspondence between LIWC outputs and human coder judgments (e.g., Ludwig et al. 2014), which explains

its frequent use for extracting psychological and linguistic constructs in top journals (e.g., Marrone and Figge 2026; Zeidan 2022). *Certainty* is captured by the LIWC-derived variable *certitude*, and the *Anxiety* variable by *emo_anx*; both are computed as the proportion of words in a post that fall into the corresponding LIWC categories. Appendix 1 presents exemplary CEO posts, characterized by *certitude* and *anxiety* in language use, respectively.

Moreover, manual annotation of all posts is performed to obtain a binary label at the post level, indicating whether the post is climate related, with 1 if the post contains climate-related content and 0 otherwise (*Climate*). In this context, we follow the UN Environment Programme, specifically SDG 13 (<https://www.unep.org/explore-topics/sustainable-development-goals/why-do-sustainable-development-goals-matter/goal-13>), to determine if a post is climate related or not. A post is labeled climate related if it is about climate change (or climate crisis or similar climate-related topics), a measure to prevent/slow climate change, or to deal with results from climate change, as well as about drivers for and the impact of climate change. We also utilized SDG 13 keyword mapping developed by the University of Auckland (<https://www.sdgmapping.auckland.ac.nz/>), which applies text mining to Elsevier's Scopus database to generate SDG-related keyword lists. These keywords guided human annotators in identifying climate-related posts and included terms such as "climate change," "climate crisis," "greenhouse gas," "climate action," and "carbon footprint." Appendix 2 presents the full coding scheme. To ensure reliability, the posts were additionally coded by two independent coders, who reviewed 967 posts

(exceeding the suggested 10% threshold for independent coding; Lombard et al. 2002) using the coding scheme we had carefully explained in advance. The intercoder reliability (*Ir*) was 98%, which is above the suggested threshold (Rust and Cooil 1994).

We further include two two-way interactions (*Certainty* × *Climate* and *Anxiety* × *Climate*) in line with schema-congruity theory's either-or view that CEOs either fulfill the “ascribed” role or not. These terms test whether language use affects public engagement differently in climate-related versus non-climate-related posts, allowing slopes to vary with climate salience rather than assuming a uniform effect.

4.2.2 | Dependent Variable

To measure public engagement, we analyze the sharing behavior of CEOs' posts (i.e., the number of retweets a post receives). This metric reflects the highest level of public engagement on X, as recipients typically share a post only when they are convinced or influenced by its content; thus, they demonstrate a form of social influence (Tur et al. 2022). Unlike likes or comments, shares extend the message's reach beyond the original audience (Villarroel Ordenes et al. 2019), making them especially valuable from a corporate communication standpoint. On average, a CEO post is shared 78 times, with a standard deviation of 723.

4.2.3 | Control Variables

In addition to the focal variables of interest, several CEO-, post-, time-, and company-related factors might influence public engagement on CEOs' postings (e.g., Pollock et al. 2024). We thus control for gender (*Gender (male)*), age (*Age*), and organizational tenure (*Tenure*). To account for differences in audience exposure on the platform, we control for the cumulative number of past posts (*Number of posts*) and followers (*Number of followers*) the CEO has (Tellis et al. 2019). Post-level attributes are proxied by the counts of @-mentions (*Mentions*), hashtags (*Hashtags*), and URLs (*Urls*), as well as indicators for quoted

and reply posts (*Quoted* and *Replied*), which capture conversational context and amplification (McShane et al. 2019; Villarroel Ordenes et al. 2019). Temporal patterns are addressed with a weekend indicator (*Weekend*), seasonal dummies for winter (*Winter*), spring (*Spring*), and summer (*Summer*)—leaving autumn as the reference—together with the day-part indicators for morning, afternoon, and evening (*Morning*, *Afternoon*, and *Evening*) (Meire et al. 2022; Rooderkerk and Pauwels 2016). Finally, because environmental salience may systematically affect public engagement (Pennesi and Giuliani 2025), we include a score for environmental ESG-related company performance (*Environmental ESG score*), while sectoral affiliation is represented with a set of industry dummies, taking value 1 if the company is in that industry and 0 otherwise. The sample covers a broad range of industries, from manufacturing and financial services to information and communication, utilities, transportation, and waste management.

4.3 | Data Analysis

Our dataset on post-level exhibits a hierarchical structure as CEOs post multiple posts during their entire tenure at the company. Because posts of the same CEO may be more similar than those of different CEOs, we use HLM to estimate this nested relationship (Hox et al. 2017). The HLM is an intercept model, and we regress the influence of these variables of interest and control variables on public engagement using a Poisson HLM (Hox et al. 2017) in accordance with the nature of the dependent variable. To account for potential endogeneity arising from correlation between the variables of interest and unobserved CEO-specific effects, we adopt a Mundlak (correlated random effects) specification by including CEO-level means of the variables of interest alongside their within-CEO deviations. This approach relaxes the standard random-effects independence assumption and allows the within-CEO estimates to be interpreted as robust to time-invariant CEO-level confounding. Maximum likelihood estimation applies to all models. The variables of interest and control variables are standardized. The HLM model does not suffer from multicollinearity, as shown in the correlation matrix in Table 2 and the low variance inflation factor scores with a maximum of 2.8.

TABLE 2 | Correlation matrix for the continuous independent variables.

		1	2	3	4	5	6	7	8	9
1	Certainty									
2	Anxiety	−0.01								
3	Age	−0.05	−0.03							
4	Tenure	0.00	0.00	0.01						
5	Number of posts	−0.03	−0.02	0.20	−0.30					
6	Number of followers	−0.03	−0.01	0.14	0.29	−0.08				
7	Mentions	0.02	−0.03	0.04	−0.19	0.20	−0.12			
8	Hashtags	−0.03	−0.04	−0.03	−0.09	0.02	−0.10	0.02		
9	URLs	−0.07	−0.06	0.11	−0.02	−0.04	0.04	−0.08	0.21	
10	Environmental ESG score	0.00	0.03	−0.01	−0.10	0.27	−0.21	−0.03	−0.19	−0.14

4.4 | Results

Table 3 contains the standardized estimates and their significance levels for the associations of certainty and anxiety in language, whether the post contains climate-related information, the interaction terms, and the control variables on public engagement (i.e., recipients' sharing behavior). A positive (negative) β represents a positive (negative) relationship between the variable and public engagement.

4.4.1 | Hypothesis Testing

CEOs' certainty in language is significantly positively associated with public engagement ($\beta=0.05$, $p<0.01$), in support of H1. In support of H2, we find that CEOs' anxiety in language shows a significant negative association with public engagement ($\beta=-0.04$, $p<0.01$). When investigating the impact of CEOs' climate-related content on public engagement, the results show that climate-related content is associated with significantly

TABLE 3 | HLM analysis results.

	Variables	Level	Public engagement	
Variables of interest	Certainty	P	0.05	(16.88)**
	Anxiety	P	-0.04	(-12.34)**
	Climate	P	-0.55	(-55.15)**
Interaction variables	Certainty $\times$ Climate	P	-0.07	(-19.03)**
	Anxiety $\times$ Climate	P	0.06	(30.65)**
Control variables	Gender (male)	C	-3.91	(-2.58)**
	Age	C	0.57	(0.89)
	Tenure	C	3.91	(139.08)**
	Number of posts	C	-0.24	(-0.33)
	Number of followers	C	-0.12	(-0.20)
	Mentions	P	-0.27	(-97.51)**
	Hashtags	P	0.38	(211.46)**
	URLs	P	-0.52	(-274.04)**
	Quoted	P	-0.42	(-76.16)**
	Replied	P	-1.10	(-151.08)**
	Weekend	P	0.17	(42.34)**
	Winter	P	-0.02	(-6.21)**
	Summer	P	-0.59	(-114.25)**
	Spring	P	-0.13	(-23.27)**
	Morning	P	-1.01	(-144.93)**
	Afternoon	P	-0.60	(-153.88)**
	Evening	P	-0.67	(-160.48)**
	Environmental ESG score	C	0.57	(0.98)
	Industry	C	Included	
	Certainty	C	-0.20	(-0.44)
	Anxiety	C	0.49	(0.55)
	Climate	C	0.98	(2.68)**
	Intercept		6.33	(2.92)**
	Number of CEOs		50	
	Number of posts		5544	
	-2 log likelihood		805,750	

Note: Standardized estimates with t values between () are reported.

Abbreviations: C, CEO; P, post.

** $p<0.01$.

lower public engagement ($\beta = -0.55, p < 0.01$). This supports H3, which states that climate-related content—on average—reduces public engagement.

Further, we investigate the interaction effect of CEOs' (in)congruent social media posts and climate-related content. We conclude that both interaction terms are significant, supporting H4 and H5. In detail, the positive association between certainty and public engagement is significantly weaker for climate-related posts ($\beta = -0.07, p < 0.01$) (H4). Conversely, the negative association for anxiety is significantly weaker for climate-related content ($\beta = 0.06, p < 0.01$) (H5).

4.4.2 | Control Variables

Among CEO-level controls, being male relates to lower public engagement ($\beta = -3.91, p < 0.01$), while tenure shows a positive association ($\beta = 3.91, p < 0.01$). Age, number of posts, number of followers, and company's environmental ESG score are not significant. At the post level, mentions ($\beta = -0.27, p < 0.01$), URLs ($\beta = -0.52, p < 0.01$), quoted posts ($\beta = -0.42, p < 0.01$), and replies ($\beta = -1.10, p < 0.01$) are associated with lower public engagement, whereas hashtags heighten it ($\beta = 0.38, p < 0.01$). Weekend posting is associated with higher public engagement ($\beta = 0.17, p < 0.01$). Relative to autumn (reference category), winter ($\beta = -0.02, p < 0.01$), summer ($\beta = -0.59, p < 0.01$), and spring ($\beta = -0.13, p < 0.01$) are associated with lower public engagement; relative to nighttime (reference category), morning ($\beta = -1.01, p < 0.01$), afternoon ($\beta = -0.60, p < 0.01$), and evening ($\beta = -0.67, p < 0.01$) are also associated with lower public engagement. Industry fixed effects are included.

4.5 | Discussion

Consistent with our hypotheses, Study 1 indicates that CEOs' congruent language use (i.e., certainty) is generally positively associated with public engagement, whereas anxiety in language use shows an overall negative association. However, the context of climate change meaningfully reshapes these dynamics. The positive association between certainty and public engagement is significantly weaker for climate-related posts, while the negative association for anxiety is correspondingly weaker, suggesting that audiences may expect, and engage more readily with, a concerned tone when CEOs address such serious issues. While these findings offer important correlational evidence, the text analysis approach cannot establish clear causal explanations, and the insights it provides into the theoretical mechanisms posited by schema-congruity theory are limited. Moreover, we are unable to observe the downstream effects of these posts on strategically relevant firm outcomes that companies strive for through their communication strategy. To address these gaps and test H6, we conduct a follow-up experiment that manipulates CEO language use in posts about climate change and investigates downstream effects inside (i.e., sharing intentions) and outside social media (i.e., company-related WOM and investment intentions).

5 | Study 2

5.1 | Research Design

We conducted a preregistered online experiment using a sample recruited through Prolific, targeting English-speaking participants who identified as active social media users. Data collection was conducted anonymously, and informed consent was obtained from all participants prior to their involvement in the study. Ethical approval was obtained before conducting the experiment. A pretest ($N = 30$) ensured the comprehensibility of the posts and effectiveness of our scales. In total, 119 respondents participated in the experiment (40% female; 58% male; 2% non-binary; mean age of participants was 32, ranging from 18 to 62).

The experiment employed a between-subjects design in which participants were randomly assigned to one of two conditions. Participants viewed a post by a company CEO on X addressing climate change and the environment; the conditions differed solely in language use, reflecting either certitude or anxiety in language. The posts were developed based on the LIWC libraries, consistent with Study 1, and word counts were kept comparable across conditions. Appendix 3 presents the posts used as stimuli and the scenario introduction.

5.2 | Measures

Following exposure to the scenario, participants completed a series of survey questions. All items were measured using 7-point Likert scales. First, participants completed an attention check to ensure adequate engagement with the post. This was followed by a manipulation check to verify that the two conditions were perceived as intended. Perceived certitude was assessed with one item ("The CEO communicates certainty in this post") and perceived anxiety was assessed with one item ("The CEO communicates in an anxious way in this post") for both conditions. The mediator attention (two items) was measured by adapting an extant scale from Wu et al. (2025). The primary dependent variables were measured using established items of behavioral intentions related to public engagement (i.e., sharing intention using a single item adapted from Wu et al. 2025), company-related WOM (three items adapted from Maxham and Netemeyer 2002), and willingness to invest in the company (two items adapted from Rennekamp and Witz 2021). Finally, we controlled for climate change concern (three-item scale adapted from A. Spence et al. 2012) and three single-item measures of X platform behavior: frequency of use, posting, and content sharing. Demographic information was collected, including age, gender, and educational background. Appendix 3 contains all items used. Table 4 presents means and standard deviations as well as correlations and reliability scores.

5.3 | Results

5.3.1 | Manipulation Checks

To test our manipulation, we conducted two independent-samples *t*-tests comparing the certitude condition ($n = 60$) and the anxiety condition ($n = 59$). Results confirmed that

TABLE 4 | Means, standard deviations, reliabilities, and correlations.

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Attention (mediator)	4.52	1.72	(0.89)							
2. Public engagement (sharing intention, DV)	3.10	2.01	0.70***	—						
3. Company-related WOM (DV)	4.24	1.43	0.59***	0.61***	(0.96)					
4. Investment intention (DV)	3.71	1.64	0.45***	0.57***	0.75***	(0.95)				
5. Climate concern (control)	5.54	1.40	0.42***	0.27**	0.30**	0.18	(0.96)			
6. Frequency of X use (control)	4.82	1.93	0.24**	0.36***	0.13	0.17	−0.02	—		
7. Frequency of posting on X (control)	2.65	1.74	0.35***	0.51***	0.36***	0.37***	0.15	0.60***	—	
8. Sharing frequency on X (control)	3.20	2.07	0.43***	0.56***	0.44***	0.40***	0.14	0.60***	0.77***	—

Note: Scale reliabilities (Cronbach's α) are shown on the diagonal in parentheses where applicable.

Abbreviation: DV, dependent variable.

** $p < 0.01$.

*** $p < 0.001$.

participants in the certitude condition rated the CEO post as significantly more certain ($M = 5.25$, $SD = 1.47$) than those in the anxiety condition ($M = 2.71$, $SD = 1.64$), $t(117) = 8.90$, $p < 0.001$, 95% CI [1.97, 3.10], Cohen's $d = 1.63$. Conversely, participants in the anxiety condition rated the post as significantly more anxious ($M = 5.78$, $SD = 1.37$) than those in the certitude condition ($M = 2.77$, $SD = 1.61$), $t(117) = -11.01$, $p < 0.001$, 95% CI [−3.56, −2.47], Cohen's $d = -2.02$. Both effects were large in magnitude. Together, these results confirm that the manipulation was successful.

5.3.2 | Hypothesis Testing: Mediation Analyses

H6 predicts that the interaction of CEOs' incongruent (i.e., anxious) versus congruent (i.e., certitude) language use with climate-related content increases recipients' attention (schema-congruity theory; Mandler 1982; Wu et al. 2025), which in turn raises public engagement, company-related WOM, and investment intentions. We tested **H6** in two steps.

First, we examined the main effect of CEO language use on attention using an independent-samples t -test. Levene's test was significant ($F = 4.400$, $p = 0.038$), indicating unequal variances, so we report Welch's t -test. Participants in the anxious condition reported significantly higher attention ($M = 4.86$, $SD = 1.55$) than those in the certitude condition ($M = 4.18$, $SD = 1.81$), $t(114.80) = -2.20$, $p = 0.030$, 95% CI [−1.293, −0.068], Cohen's $d = -0.40$.

Second, we tested whether attention mediates the effect of CEO language use on each outcome, controlling for climate concern and X usage and frequency, using PROCESS Model 4 (Hayes 2022) with 5000 bootstrap samples. Across all three models, CEO language use significantly predicted the mediator, attention ($a = 0.61$, $p = 0.02$), consistent with the t -test above; the results below therefore differ only in the second stage and the resulting indirect effect.

5.3.2.1 | Public Engagement (i.e., Intention to Share). Attention positively predicted sharing intention ($b = 0.67$, $p < 0.001$). The direct effect of CEO language use was not significant ($c' = -0.15$, $p = 0.56$), and the indirect effect through attention was $ab = 0.41$, 95% CI [0.07, 0.79], indicating full mediation.

5.3.2.2 | Company-Related WOM. Attention positively predicted WOM intentions ($b = 0.41$, $p < 0.001$). The direct effect was not significant ($c' = -0.37$, $p = 0.08$), and the indirect effect through attention was $ab = 0.25$, 95% CI [0.04, 0.51], again indicating full mediation.

5.3.2.3 | Investment Intentions. Attention positively predicted investment intentions ($b = 0.35$, $p < 0.001$). The direct effect was not significant ($c' = -0.30$, $p = 0.28$), and the indirect effect through attention was $ab = 0.22$, 95% CI [0.03, 0.46], indicating full mediation.

5.4 | Discussion

The results of our analysis show that the CEO climate-related post using anxiety in language elicits modestly but significantly greater attention than the post based on certainty in language, with a small-to-medium effect size, confirming **H6a–c**. This complements our text analysis results. Although anxiety in CEO language is generally incongruent, it seems to be appropriate in the climate context as it fits the topic, thus rendering it congruent (Mandler 1982) and increasing processing fluency (Reber et al. 2004).

Our mediation analyses further show that, in the climate context, anxiety in language has positive downstream effects on sharing, company-related WOM, and investment intentions. These findings reinforce our text analysis of actual CEO posts in a controlled setting and strengthen the notion that, in this context, anxiety in language is perceived as congruent. Thus,

the experiment demonstrates that matching CEOs' language use to the topic can produce positive effects that even extend beyond public engagement (i.e., sharing behavior) to support companies' social and financial performance.

6 | General Discussion

CEOs' social media communication about major societal challenges can strongly influence public discourse (Chatterji and Toffel 2018; Huang and Yeo 2018). Such communication functions as a strategic signal: by publicly addressing issues such as climate change, CEOs convey credible cues about their company's stance on stakeholders (M. Spence 1973; Connelly et al. 2025). Yet, little is known about how CEOs should communicate about such sensitive issues to stimulate public engagement and strategically relevant downstream effects such as WOM and investment intentions. Building on schema-congruity theory and processing fluency theory, this study therefore examines how (in)congruity in CEOs' language use affects public engagement and these downstream consequences, and how climate-related content shapes those effects.

Consistent with our hypotheses, Study 1 finds that congruent language use (i.e., certainty) is generally positively associated with public engagement. While recent literature (e.g., Schanke et al. 2024; Wu et al. 2025) indicates that incongruent information or objects are more likely to capture attention due to their novelty, our results align with schema-congruity theory (Mandler 1982) and processing fluency theory (Reber et al. 2004; X. Yang et al. 2025). One explanation for the results in our context might be that recipients feel more secure sharing content on social media, which is communicated with greater certainty by a credible persona and may thus appear more factual (Dubois et al. 2011). Moreover, CEOs are usually perceived as having a higher social status and authority than the general user (Deng et al. 2025), which might make them more credible and sharing their message less risky for the recipient's own reputation (Dubois et al. 2011). Furthermore, the adverse effect of anxiety in language (i.e., incongruent language use) on public engagement might stem from the negative emotions it evokes, leading recipients to share such posts less often on social media (Akpınar and Berger 2017; Berger and Milkman 2012). In sum, the results of Study 1 challenge current research arguing that incongruent language use evokes more public engagement in the social media context (e.g., Wu et al. 2025) but align with other research that finds the opposite effect (e.g., Cabano et al. 2024; Tracy et al. 2021). Thus, contextual factors seem to play a crucial role in the effects of (in)congruent language use on public engagement.

In fact, considering the context of climate change, Study 1 finds that the positive association between certainty in language and public engagement is significantly reduced when a CEO posts climate-related content, and Study 2 reveals corresponding downstream consequences outside social media for company-related WOM and investment intentions. While certainty in CEO language use is typically received favorably, our results suggest that climate-related content may overshadow this positive effect, potentially due to the inherent complexity and sensitivity of climate issues (Falkenberg et al. 2022). In contrast, the

general negative impact of anxiety in language use on public engagement, company-related WOM, and investment intentions is reduced when CEOs post climate-related content. This implies that audiences possibly expect a concerned tone when discussing such serious issues.

6.1 | Theoretical Implications

This study offers three key theoretical contributions. First, we extend schema-congruity theory to CEO social media communication. Prior research on CEO communication has largely documented the effects of specific linguistic characteristics (e.g., emotional tone, authenticity, or sentiment) (Yue et al. 2019) but has offered limited theoretical explanation for why certain language styles are more effective than others. Drawing on schema-congruity theory, we argue that the audience holds well-established expectations regarding how CEOs should communicate and that language expressing certainty is generally more congruent with these expectations than language expressing anxiety. Thus, by conceptualizing CEO language through the lens of schema-congruity theory, we introduce a theoretically grounded perspective for explaining audience responses based on the fit between role expectations and language use. In doing so, we extend schema-congruity theory to an important but underexplored communication context and move CEO communication toward providing a conceptual framework for understanding how the audience evaluates CEO communication on social media.

Second, we identify climate-related communication as an important boundary condition for schema-congruity effects. While prior research has examined CSR communication on social media more broadly, such as the role of social media in developing successful CSR initiatives (Chu et al. 2020), CEO climate-related content has received limited attention, particularly regarding its potential adverse effects (Acuti et al. 2022). Our findings reveal that such content is, in itself, associated with lower public engagement, addressing an important gap in how issue sensitivity shapes audience responses and highlighting the distinct communication challenges CEOs face when addressing emotionally charged topics. Beyond this direct association, the context of climate change also reshapes the effects of CEO language use. Existing research generally assumes that language congruent with the CEO role, such as certainty, produces more favorable outcomes (Mandler 1982). Our findings demonstrate that this assumption does not hold universally: Communication effectiveness depends on the interaction between role expectations and topic context. Specifically, climate-related communication constitutes a distinct context characterized by uncertainty, risk, urgency, and societal concern. In such settings, anxiety in language can become more appropriate and effective, despite being generally incongruent with traditional CEO role expectations. This advances schema-congruity theory by showing that congruity is not a fixed characteristic of a communicator but is jointly determined by communicator role expectations and communication context. By introducing climate-related communication as a contextual boundary condition, we advance schema-congruity theory toward a more context-sensitive perspective and help reconcile inconsistent findings (e.g., Berger and Packard 2018; Schanke et al. 2024; Tracy et al. 2021; Wu

et al. 2025) on the effectiveness of role-congruent versus incongruent communication.

Third, we further develop schema-congruity theory by uncovering the psychological process through which schema-(in)congruent CEO communication shapes audience responses. Prior studies (e.g., Huang and Yeo 2018) have primarily focused on the direct effects of CEO communication on engagement outcomes, offering limited insight into the underlying mechanisms through which these effects emerge. Our findings suggest that anxiety in language, although generally incongruent with the confident and decisive image associated with CEOs (Ryan et al. 2011), becomes more fitting when paired with climate-related content characterized by uncertainty and concern. This contextual fit appears to alter audience processing and evaluation of CEO communication. Through our experimental study, we identify attention as the key mechanism linking this fit to social media engagement and downstream outcomes, including company-related WOM and investment intention, underscoring the strategic relevance of CEO communication (Craig and Amernic 2020). These findings are consistent with explanations derived from processing fluency theory (Reber et al. 2004), which suggests that messages perceived as congruent are processed more easily and assessed more favorably. By identifying attention as the mechanism through which these effects unfold, we extend schema-congruity theory from a predominantly outcome-oriented perspective toward a more process-oriented understanding of audience reactions. Furthermore, by demonstrating that these effects extend beyond social media engagement to socially and financially relevant firm outcomes, we respond to calls (e.g., Weber et al. 2026) to connect CEO social media communication with its broader organizational implications.

6.2 | Managerial Implications

Our findings offer several practical implications for CEOs, strategic corporate communication professionals, and policymakers. First, our findings suggest that language use is an important factor shaping audience responses to CEO communication. Across general corporate contexts, CEOs' congruent language (i.e., certainty) tends to be associated with higher public engagement, indicating that audiences respond favorably to language that aligns with CEO role expectations. CEOs may therefore consider not only what is communicated but also how messages are framed linguistically. Thus, if they want to set a topic strategically, CEOs can consider using congruent language by expressing certainty, for example, through certainty-associated words (e.g., "really," "actually," or "of course"; Boyd et al. 2022).

Second, our findings highlight that the effectiveness of CEOs' language use is context dependent. While expressions of certainty generally tend to be associated with higher public engagement, this pattern changes in climate-related communication. In this context, certainty appears to be less beneficial and may even be associated with less favorable audience responses. By contrast, expressions of anxiety are associated with higher public engagement and, through increased attention, with more favorable company-related WOM and stronger investment intentions.

These findings suggest that audiences do not evaluate CEOs' language use independently of the topic being discussed. Rather, the effectiveness of a particular linguistic expression depends on whether it is perceived as appropriate for the communication context. Accordingly, CEOs and communication professionals may benefit from considering the fit between language use and the topic being communicated. In the case of climate change, using words associated with anxiety (e.g., "worry," "afraid," or "fear"; Boyd et al. 2022) may be more effective than language that conveys certainty. We emphasize, however, that this recommendation must be applied with care and not be generalized to corporate communication more broadly. Only in specific contexts where anxiety in language seems appropriate (e.g., climate change as in our case or healthcare crises) can such language strengthen public engagement and signal strategic differentiation from other companies in sustainability debates (N. Yang et al. 2024). Used judiciously, our findings can thus inform corporate communication strategies and help companies navigate the complexities of climate-related communication on social media.

Third, for policymakers, this research provides evidence-based guidance on how corporate leaders can become effective allies in promoting sustainability and shaping public discourse on climate issues. While the United Nations (2022) emphasizes what should be communicated—namely, authoritative scientific information, clear problem–solution framing, and calls to action—our findings complement this perspective by suggesting that CEO language use also influences how audiences receive and engage with climate-related messages. In doing so, the study equips policymakers with evidence to encourage and support corporate leaders in adopting communication practices that strengthen public engagement for climate action, ideally contributing to SDG 13.

6.3 | Limitations and Future Research

While our studies provide novel insights by revealing that communicating about climate-related topics significantly impacts the effectiveness of specific language use, we acknowledge some limitations that open avenues for further research. For instance, our research focuses on climate-related messages, but other contextual settings warrant study. For example, other crisis contexts, such as economic or geopolitical crises, would be valuable avenues for future research. These contexts differ in their levels of uncertainty, emotional charge, and stakeholder expectations (Coombs 2007), which may alter how (in)congruent CEO communication is perceived and evaluated. In geopolitical crises, anxiety in language might be read as empathy and realism, whereas during an economic downturn, certainty in language may be expected to reassure external stakeholders. In company-specific crises, such as financial scandals, product recalls, or organizational restructuring, the audience shifts from the broader public to employees and internal stakeholders, who may evaluate CEOs' language use through the lens of their immediate professional and personal concerns. Certainty in language may then stabilize and reduce uncertainty within the workforce, while anxiety in language might either heighten it or, conversely, be seen as an authentic acknowledgment of shared challenges.

As our research focuses on CEO (in)congruent language use on social media, other language signals could also be interesting. For example, future research could investigate whether CEO social media communication is more effective when linguistic techniques, such as storytelling or sharing personal views, are employed to discuss sensitive topics, such as the climate crisis (Araujo and Kollat 2018). Furthermore, such studies could also consider alternative theoretical mechanisms, such as risk communication or emotional contagion, which might complementarily explain the positive or negative effects of different language use on social media.

We chose X to study CEOs' language use. However, existing research (e.g., Villarroel Ordenes et al. 2019) shows that the effectiveness of social media communication also depends on the specific social media platform. Thus, it is possible that CEO (in)congruent language use, particularly when combined with climate-related topics, could have a different impact on other social media platforms and with a more diverse sample not limited to posts in English. More specifically, while X is a very popular platform for CEO social media communication, other platforms, such as LinkedIn or Instagram, may offer different possibilities for expression (e.g., longer posts on LinkedIn) that cater to different audiences (Lee et al. 2026) and might expand the sample of represented CEOs.

While our study focuses on CEO language use and controls for key CEO, post, time, and company variables, we do not account for individual or platform effects. Depending on which users follow a given CEO, audiences may weight climate-related topics differently or perceive them as greenwashing, which could weaken public engagement and its strategic downstream effects (Kronrod et al. 2012; Torelli et al. 2020; Rehman et al. 2025). Future research could therefore examine the individual characteristics that distinguish users who share climate-related posts from those who do not (Chen et al. 2019), as well as contextual factors such as local environmental regulation (Li et al. 2023), clarifying the sources of this variation and how CEOs might tailor their language to specific audiences.

Finally, our two methodological approaches carry further limitations. The text analysis captures language use through dictionary-based measures of certainty and anxiety, which reflect aggregate linguistic patterns but cannot fully capture the contextual meaning, tone, or intent behind individual posts. The experiment complements this with greater internal validity, yet its controlled setting necessarily reduces ecological validity, as participants respond to a constructed post rather than to a CEO they actively follow. Future research could combine the strengths of both approaches, for instance, by validating dictionary-based measures against more context-sensitive methods (e.g., large language model-based methods (Mousavi et al. 2026) or corpus linguistics (Mautner et al. 2026)), or by testing these effects in field settings with real audiences.

Author Contributions

Ellen Weber: conceptualization, methodology, writing – original draft, writing – review and editing, formal analysis, investigation, validation, visualization, project administration, supervision, data curation.

Marah Blaurock: conceptualization, investigation, validation, methodology, formal analysis, visualization, writing – original draft, writing – review and editing. **Kristof Coussement:** methodology, data curation, formal analysis, writing – original draft, visualization, validation, software, writing – review and editing. **Irini Tsaga:** conceptualization, formal analysis, data curation. **Marion Büttgen:** writing – review and editing, supervision, conceptualization, methodology, validation.

Acknowledgements

Open Access funding enabled and organized by Projekt DEAL.

Funding

The authors have nothing to report.

Ethics Statement

For Study 1, we use secondary data (i.e., 5544 posts on X by 50 CEOs of Global *Fortune* 500 companies). The posts are publicly available and shared voluntarily by the CEOs. Moreover, we only scrape this data and do not use an experimental design in which we would, for example, manipulate the language used in a post. By only scraping these data, we are not involved in any business processes of X or one of the Global *Fortune* 500 companies and do not produce any user reactions. The results of Study 1 do not permit any conclusions about individual CEOs, as we conduct aggregated analyses based on all CEOs' posts (i.e., 5544 posts on X by 50 CEOs of Global *Fortune* 500 companies).

The scenario-based experiment (Study 2) was evaluated by the Ethics Committee of the University of Hohenheim and Catholic University of Eichstätt-Ingolstadt and was favorably approved (i.e., ethical approval). Moreover, we preregistered the scenario-based experiment on *AsPredicted* (#274262) titled "CEOs' Climate-related Communication."

For both studies, we follow best practices (e.g., data storage and aggregated reporting) to ensure data autonomy and confidentiality.

Consent

Participation in Study 2 was voluntary and based on fully informed consent. Participants received a plain-language information sheet outlining the study's objectives, procedures, data handling, and their right to withdraw at any time without consequences. No sensitive data were requested. Data were collected anonymously and cannot be traced back to individuals.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

To promote research transparency, the author team commits to making the data, if necessary, available on an online repository. Specifically, the following three data sources could be made available:

1. The entire list of X handles of all CEOs of the Global *Fortune* 500 companies considered in this paper.
2. The final dataset, including CEOs' posts on X and corresponding users' sharing behavior, the classification of climate-related and non-climate-related CEO posts, and control variables.
3. The data collected with the scenario-based experiment. In this case, we would fully ensure participants' anonymity (e.g., not sharing the demographic variables).

Based on the provided datasets, one can conduct the main tests reported in the manuscript. Moreover, we have clearly and understandably presented the data collection procedures, measures, and the data analytic methods we used in our research in the manuscript.

References

- Acuti, D., M. Pizzetti, and S. Dolnicar. 2022. "When Sustainability Backfires: A Review on the Unintended Negative Side-Effects of Product and Service Sustainability on Consumer Behavior." *Psychology & Marketing* 39, no. 10: 1933–1945. <https://doi.org/10.1002/mar.21709>.
- Ahmed, T., and G. D. Saxton. 2025. "The Price of Controversy: CEO Twitter Activity and Stock Market Performance." *Public Relations Review* 51: 102606. <https://doi.org/10.1016/j.pubrev.2025.102606>.
- Akpınar, E., and J. Berger. 2017. "Valuable Virality." *Journal of Marketing Research* 54, no. 2: 318–330. <https://doi.org/10.1509/jmr.13.0350>.
- Alnawas, I., K. El Hedhli, A. Abu Farha, and H. Zourrig. 2024. "The Effects of Hotels' Environmental Sustainability Communication Strategies on Social Media Engagement and Brand Advocacy: The Roles of Communication Characteristics and Customers' Personality Traits." *Journal of Vacation Marketing* 30: 596–613. <https://doi.org/10.1177/13567667231222935>.
- Alzahawi, S., and F. J. Flynn. 2025. "Does Expressing Uncertainty Help or Harm Leaders?" *Leadership Quarterly* 36, no. 5: 101880. <https://doi.org/10.1016/j.leaqua.2025.101880>.
- Andreu, L., D. V. de Mingo-López, J. C. Matallín-Saez, and J. L. Sarto. 2025. "Media Attention to Climate Change and Investor Flows in US Equity Mutual Funds." *Business Strategy and the Environment* 34, no. 6: 6555–6576. <https://doi.org/10.1002/bse.70458>.
- Araujo, T., and J. Kollat. 2018. "Communicating Effectively About CSR on Twitter." *Internet Research* 28, no. 2: 419–431. <https://doi.org/10.1108/IntR-04-2017-0172>.
- Arvidsson, S., and S. Sabelfeld. 2023. "Adaptive Framing of Sustainability in CEO Letters." *Accounting, Auditing & Accountability Journal* 36, no. 9: 161–199. <https://doi.org/10.1108/AAAJ-11-2019-4274>.
- Baskoro, M. L., B. Tjahjono, M. Beltran, A. Bogush, and R. K. Brahmana. 2024. "Exploring the Efficacy of Ecolabels as a Marketing Strategy: Insights From the Emerging Bioplastic Packaging Market." *Business Strategy and the Environment* 33, no. 7: 7651–7669. <https://doi.org/10.1002/bse.3891>.
- Bennett, W. L. 2012. "The Personalization of Politics." *Annals of the American Academy of Political and Social Science* 644, no. 1: 20–39. <https://doi.org/10.1177/0002716212451428>.
- Berger, J., and K. L. Milkman. 2012. "What Makes Online Content Viral?" *Journal of Marketing Research* 49, no. 2: 192–205. <https://doi.org/10.1509/jmr.10.0353>.
- Berger, J., and G. Packard. 2018. "Are Atypical Things More Popular?" *Psychological Science* 29, no. 7: 1178–1184. <https://doi.org/10.1177/0956797618759465>.
- Boyd, R. L., A. Ashokkumar, S. Seraj, and J. W. Pennebaker. 2022. "The Development and Psychometric Properties of LIWC-22." <https://www.liwc.app/static/documents/LIWC-22%20Manual%20-%20Development%20and%20Psychometrics.pdf>.
- Brehm, J., and H. Gruhl. 2024. "Increase in Concerns About Climate Change Following Climate Strikes and Civil Disobedience in Germany." *Nature Communications* 15, no. 1: 2916. <https://doi.org/10.1038/s41467-024-46477-4>.
- Cabano, F. G., M. Li, and F. R. Jiménez. 2024. "Consumer Responses to CEO Activism: An Impression Management Approach." *European Journal of Marketing* 58, no. 5: 1275–1297. <https://doi.org/10.1108/EJM-07-2022-0553>.
- Chatterji, A., and M. W. Toffel. 2018. "The New CEO Activists." *Harvard Business Review* 96, no. 1: 78–89. <https://hbr.org/2018/01/the-new-ceo-activists>.
- Chen, X., X. Li, D. Yao, and Z. Zhou. 2019. "Seeking the Support of the Silent Majority: Are Lurking Users Valuable to UGC Platforms?" *Journal of the Academy of Marketing Science* 47, no. 6: 986–1004. <https://doi.org/10.1007/s11747-018-00624-8>.
- Cho, M., L. D. Furey, and T. Mohr. 2017. "Communicating Corporate Social Responsibility on Social Media." *Business and Professional Communication Quarterly* 80, no. 1: 52–69. <https://doi.org/10.1177/2329490616663708>.
- Chu, S.-C., H.-T. Chen, and C. Gan. 2020. "Consumers' Engagement With Corporate Social Responsibility (CSR) Communication in Social Media: Evidence From China and the United States." *Journal of Business Research* 110: 260–271. <https://doi.org/10.1016/j.jbusres.2020.01.036>.
- Connelly, B. L., S. T. Certo, C. R. Reutzel, M. R. DesJardine, and Y. S. Zhou. 2025. "Signaling Theory: State of the Theory and Its Future." *Journal of Management* 51, no. 1: 24–61. <https://doi.org/10.1177/01492063241268459>.
- Conte, F., A. Siano, and A. Vollero. 2017. "CEO Communication: Engagement, Longevity and Founder Centrality." *Corporate Communications: An International Journal* 22, no. 3: 273–291. <https://doi.org/10.1108/CCIJ-10-2015-0062>.
- Coombs, W. T. 2007. "Protecting Organization Reputations During a Crisis: The Development and Application of Situational Crisis Communication Theory." *Corporate Reputation Review* 10, no. 3: 163–176. <https://doi.org/10.1057/palgrave.crr.1550049>.
- Craig, R., and J. Amernic. 2020. "Benefits and Pitfalls of a CEO'S Personal Twitter Messaging." *Strategy & Leadership* 48, no. 1: 43–48. <https://doi.org/10.1108/SL-10-2019-0154>.
- Dang, M., P. Puwanenthiren, K. Hoang, and T. Q. Nguyen. 2026. "Tone Symphony in Climate-Exposed Firms." *Business Strategy and the Environment* 35, no. 3: 3625–3654. <https://doi.org/10.1002/bse.70321>.
- de Vries, R. E., A. Bakker-Pieper, and W. Oostenveld. 2010. "Leadership = Communication? The Relations of Leaders' Communication Styles With Leadership Styles, Knowledge Sharing and Leadership Outcomes." *Journal of Business and Psychology* 25: 367–380. <https://doi.org/10.1007/s10869-009-9140-2>.
- Deng, H., S. Yang, and L. Jin. 2025. "Too Assertive to Recommend: The Effect of Assertive Tone on Referral Behavior." *Journal of Retailing* 101, no. 1: 40–54. <https://doi.org/10.1016/j.jretai.2024.12.001>.
- Dubois, D., D. D. Rucker, and Z. L. Tormala. 2011. "From Rumors to Facts, and Facts to Rumors: The Role of Certainty Decay in Consumer Communications." *Journal of Marketing Research* 48, no. 6: 1020–1032. <https://doi.org/10.1509/jmr.09.0018>.
- Falkenberg, M., A. Galeazzi, M. Torricelli, et al. 2022. "Growing Polarization Around Climate Change on Social Media." *Nature Climate Change* 12, no. 12: 1114–1121. <https://doi.org/10.1038/s41558-022-01527-x>.
- Fariello, G., and D. Jemielniak. 2025. "The Changing Language and Sentiment of Conversations About Climate Change in Reddit Posts Over Sixteen Years." *Communications Earth & Environment* 6, no. 1: 3. <https://doi.org/10.1038/s43247-024-01974-8>.
- Gao, X., I. E. De Hooge, and A. R. Fischer. 2022. "Something Underneath? Using a Within-Subjects Design to Examine Schema Congruity Theory at an Individual Level." *Journal of Retailing and Consumer Services* 68: 102994. <https://doi.org/10.1016/j.jretconser.2022.102994>.
- Gerrath, M. H., and A. Biraglia. 2021. "How Less Congruent New Products Drive Brand Engagement: The Role of Curiosity." *Journal of Business Research* 127: 13–24. <https://doi.org/10.1016/j.jbusres.2021.01.014>.
- Grover, P., A. K. Kar, and P. V. Ilavarasan. 2019. "Impact of Corporate Social Responsibility on Reputation—Insights From Tweets on Sustainable Development Goals by CEOs." *International Journal of*

- Information Management* 48: 39–52. <https://doi.org/10.1016/j.ijinfomgt.2019.01.009>.
- Hamelberg, K., K. Ruyter, W. van Dolen, and U. Konuş. 2025. “Finding the Right Voice: How CEO Communication on the Russia–Ukraine War Drives Public Engagement and Digital Activism.” *Journal of Public Policy & Marketing* 44, no. 1: 140–159. <https://doi.org/10.1177/07439156241230910>.
- Hayes, A. F. 2022. *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. 3rd ed. Guilford Press.
- Hox, J. J., M. Moerbeek, and R. van de Schoot. 2017. *Multilevel Analysis: Techniques and Applications*. 3rd ed. Taylor & Francis Group. <https://doi.org/10.4324/9781315650982>.
- Huang, L. V., and T. E. D. Yeo. 2018. “Tweeting #Leaders.” *Internet Research* 28, no. 1: 123–142. <https://doi.org/10.1108/IntR-08-2016-0248>.
- Iliopoulou, E., E. Koronaki, A. Vlachvei, and O. Notta. 2024. “From Knowledge to Action: The Power of Green Communication and Social Media Engagement in Sustainable Food Consumption.” *Sustainability* 16, no. 21: 9202. <https://doi.org/10.3390/su16219202>.
- Kim, T., J. J. Lee, and J. Kim. 2025. “Should Influencer CEOs Speak Out? The Interplay Among Influencer CEO Activism, Self-Disclosure on Social Media, and Political Ideology.” *Internet Research*. Ahead-of-print. <https://doi.org/10.1108/INTR-02-2024-0271>.
- Kronrod, A., A. Grinstein, and L. Wathieu. 2012. “Go Green! Should Environmental Messages Be so Assertive?” *Journal of Marketing* 76, no. 1: 95–102. <https://doi.org/10.1509/jm.10.0416>.
- Labroo, A. A., and A. Y. Lee. 2006. “Between Two Brands: A Goal Fluency Account of Brand Evaluation.” *Journal of Marketing Research* 43: 374–385. <https://doi.org/10.1509/jmkr.43.3.374>.
- Lee, Y., D. Yoon, and C. A. Yue. 2026. “The Value of CEO Communication on Social Media for Internal Relationship Management and Employees’ Social Media Engagement.” *Internet Research* 36: 1158–1180. <https://doi.org/10.1108/INTR-05-2024-0705>.
- Li, W., W. Li, V. Seppänen, and T. Koivumäki. 2023. “Effects of Greenwashing on Financial Performance: Moderation Through Local Environmental Regulation and Media Coverage.” *Business Strategy and the Environment* 32, no. 1: 820–841. <https://doi.org/10.1002/bse.3177>.
- Liu, Z., R. Geng, Y. K. M. Tse, and S. Han. 2023. “Mapping the Relationship Between Social Media Usage and Organizational Performance: A Meta-Analysis.” *Technological Forecasting and Social Change* 187: 122253. <https://doi.org/10.1016/j.techfore.2022.122253>.
- Lombard, M., J. Snyder-Duch, and C. C. Bracken. 2002. “Content Analysis in Mass Communication: Assessment and Reporting of Intercoder Reliability.” *Human Communication Research* 28, no. 4: 587–604. <https://doi.org/10.1111/j.1468-2958.2002.tb00826.x>.
- Lorson, A., C. Cummins, and H. Rohde. 2021. “Strategic Use of (Un)certain Expressions.” *Frontiers in Communication* 6: 635156. <https://doi.org/10.3389/fcomm.2021.635156>.
- Loureiro, M. L., and M. Alló. 2020. “Sensing Climate Change and Energy Issues: Sentiment and Emotion Analysis With Social Media in the U.K. and Spain.” *Energy Policy* 143: 111490. <https://doi.org/10.1016/j.enpol.2020.111490>.
- Ludwig, S., K. de Ruyter, D. Mahr, M. Wetzels, E. Brügggen, and T. de Ruyck. 2014. “Take Their Word for It: The Symbolic Role of Linguistic Style Matches in User Communities.” *MIS Quarterly* 38, no. 4: 1201–1218. <https://doi.org/10.25300/misq/2014/38.4.12>.
- Mandler, G. 1982. “The Structure of Value: Accounting for Taste.” In *Affect and Cognition*, edited by M. S. Clark and S. T. Fiske, 3–36. Lawrence Erlbaum Associates. <https://doi.org/10.4324/9781315802756>.
- Marrone, M., and F. Figge. 2026. “Words That Mean Change: Paradoxical Thinking and Eco-Efficiency in the Automotive Sector.” *Business Strategy and the Environment* 35: 1239–1254. <https://doi.org/10.1002/bse.70231>.
- Matthews, M. J., S. H. Matthews, D. Wang, and T. K. Kelemen. 2022. “Tweet, Like, Subscribe! Understanding Leadership Through Social Media Use.” *Leadership Quarterly* 33, no. 1: 101580. <https://doi.org/10.1016/j.leaqua.2021.101580>.
- Mautner, G., A. Whittle, and M. Gillings. 2026. “Corpus Linguistics for Leadership Studies: Bridging the Quantitative-Qualitative Divide.” *Leadership Quarterly* 37, no. 3: 101961. <https://doi.org/10.1016/j.leaqua.2026.101961>.
- Maxham, J. G., III, and R. G. Netemeyer. 2002. “A Longitudinal Study of Complaining Customers’ Evaluations of Multiple Service Failures and Recovery Efforts.” *Journal of Marketing* 66, no. 4: 57–71. <https://doi.org/10.1509/jmkg.66.4.57.18512>.
- McShane, L., E. Pancer, and M. Poole. 2019. “The Influence of B to B Social Media Message Features on Brand Engagement: A Fluency Perspective.” *Journal of Business-to-Business Marketing* 26, no. 1: 1–18. <https://doi.org/10.1080/1051712X.2019.1565132>.
- Meire, M., K. Coussemant, A. de Caigny, and S. Hoornaert. 2022. “Does It Pay Off to Communicate Like Your Online Community? Evaluating the Effect of Content and Linguistic Style Similarity on B2B Brand Engagement.” *Industrial Marketing Management* 106: 292–307. <https://doi.org/10.1016/j.indmarman.2022.09.006>.
- Meyers-Levy, J., and A. M. Tybout. 1989. “Schema Congruity as a Basis for Product Evaluation.” *Journal of Consumer Research* 16: 39–54. <https://doi.org/10.1086/209192>.
- Milfeld, T., and M. Pittman. 2024. “Altercast Framing With Assertive Sustainability Messages: How Dominant Brands Can Motivate Non-Green Consumers.” *International Journal of Advertising* 43, no. 1: 173–201. <https://doi.org/10.1080/02650487.2023.2219150>.
- Miller, S., P. Menard, and D. Bourrie. 2024. “I’m Not Fluent: How Linguistic Fluency, New Media Literacy, and Personality Traits Influence Fake News Engagement Behavior on Social Media.” *Information & Management* 61, no. 2: 103912. <https://doi.org/10.1016/j.im.2023.103912>.
- Mousavi, R., B. Kitchens, A. G. Oliver, and A. Abbasi. 2026. “From Lexicons to Large Language Models: A Holistic Evaluation of Psychometric Text Analysis in Social Science Research.” *Information Systems Research*. Ahead-of-print. <https://doi.org/10.1287/isre.2024.1143>.
- Mulki, J. P., F. Jaramillo, S. Malhotra, and W. B. Locander. 2012. “Reluctant Employees and Felt Stress: The Moderating Impact of Manager Decisiveness.” *Journal of Business Research* 65, no. 1: 77–83. <https://doi.org/10.1016/j.jbusres.2011.01.019>.
- Neckel, S., and M. Hasenfratz. 2021. “Climate Emotions and Emotional Climates: The Emotional Map of Ecological Crises and the Blind Spots on Our Sociological Landscapes.” *Social Science Information* 60, no. 2: 253–271. <https://doi.org/10.1177/0539018421996264>.
- O’Neill, S., and S. Nicholson-Cole. 2009. “Fear Won’t Do It.” *Science Communication* 30, no. 3: 355–379. <https://doi.org/10.1177/1075547008329201>.
- Paliwoda-Matiolańska, A., and A. Nakayama. 2024. “Sustainability Strategic Framing in Corporate Communication: Contextual Semantics of Twitter in the Energy Sector.” *Profesional de la Información* 33, no. 3: e330304. <https://doi.org/10.3145/epi.2024.0304>.
- Pennesi, A., and M. Giuliani. 2025. “Social Media and Sustainability Reporting: A Literature Review.” *Sustainable Development* 33, no. 5: 7314–7335. <https://doi.org/10.1002/sd.3524>.
- Pezzuti, T., J. M. Leonhardt, and C. Warren. 2021. “Certainty in Language Increases Consumer Engagement on Social Media.” *Journal of Interactive Marketing* 53, no. 1: 32–46. <https://doi.org/10.1016/j.intmar.2020.06.005>.

- Pollock, T. G., R. Ragozzino, and D. P. Blevins. 2024. "Not Like the Rest of Us? How CEO Celebrity Affects Quarterly Earnings Call Language." *Journal of Management* 50, no. 4: 1198–1229. <https://doi.org/10.1177/01492063221150629>.
- Qureshi, A. A. 2024. "The Power of Social Media: Effects of CEO Tweets on Stock Performance." *Eurasian Business Review* 14: 779–805. <https://doi.org/10.1007/s40821-024-00251-0>.
- Reber, R., N. Schwarz, and P. Winkielman. 2004. "Processing Fluency and Aesthetic Pleasure: Is Beauty in the Perceiver's Processing Experience?" *Personality and Social Psychology Review* 8, no. 4: 364–382. https://doi.org/10.1207/s15327957pspr0804_3.
- Rehman, A. U., S. Kumar, R. Alghafes, L. Broccardo, and A. K. Patel. 2025. "Role of Greenwashing in Influencing Brand Attitude and Consumption: Identifying Sustainable Business Strategies." *Business Strategy and the Environment* 34, no. 6: 6686–6703. <https://doi.org/10.1002/bse.4300>.
- Rennekamp, K. M., and P. D. Witz. 2021. "Linguistic Formality and Audience Engagement: Investors' Reactions to Characteristics of Social Media Disclosures." *Contemporary Accounting Research* 38: 1748–1781. <https://doi.org/10.1111/1911-3846.12661>.
- Rooderkerk, R. P., and K. H. Pauwels. 2016. "No Comment?! The Drivers of Reactions to Online Posts in Professional Groups." *Journal of Interactive Marketing* 35, no. 1: 1–15. <https://doi.org/10.1016/j.intmar.2015.12.003>.
- Rust, R. T., and B. Cooil. 1994. "Reliability Measures for Qualitative Data: Theory and Implications." *Journal of Marketing Research* 31, no. 1: 1–14. <https://doi.org/10.1177/002224379403100101>.
- Ryan, M. K., S. A. Haslam, M. D. Hersby, and R. Bongiorno. 2011. "Think Crisis-Think Female: The Glass Cliff and Contextual Variation in the Think Manager-Think Male Stereotype." *Journal of Applied Psychology* 96, no. 3: 470–484. <https://doi.org/10.1037/a0022133>.
- Schanke, S., G. Ray, G. Adomavicius, and M. Wagle. 2024. "Content and Style of Firm-Generated Posts on Social Media: A Study of User Engagement on Hedonic and Utilitarian Product Pages on Facebook." *Journal of the Association for Information Systems* 25, no. 2: 341–361. <https://doi.org/10.17705/1jais.00838>.
- Spence, A., W. Poortinga, and N. Pidgeon. 2012. "The Psychological Distance of Climate Change." *Risk Analysis* 32: 957–972. <https://doi.org/10.1111/j.1539-6924.2011.01695.x>.
- Spence, M. 1973. "Job Market Signaling." *Quarterly Journal of Economics* 87: 355–374. <https://doi.org/10.2307/1882010>.
- Tannenbaum, M. B., J. Hepler, R. S. Zimmerman, et al. 2015. "Appealing to Fear: A Meta-Analysis of Fear Appeal Effectiveness and Theories." *Psychological Bulletin* 141, no. 6: 1178–1204. <https://doi.org/10.1037/a0039729>.
- Tellis, G. J., D. J. MacInnis, S. Tirunillai, and Y. Zhang. 2019. "What Drives Virality (Sharing) of Online Digital Content? The Critical Role of Information, Emotion, and Brand Prominence." *Journal of Marketing* 83, no. 4: 1–20. <https://doi.org/10.1177/0022242919841034>.
- Torelli, R., F. Balluchi, and A. Lazzini. 2020. "Greenwashing and Environmental Communication: Effects on Stakeholders' Perceptions." *Business Strategy and the Environment* 29, no. 2: 407–421. <https://doi.org/10.1002/bse.2373>.
- Tracy, E. M., J. Billingsley, J. M. Pollack, et al. 2021. "A Behavioral Insights Approach to Recruiting Entrepreneurs for an Academic Study During the COVID-19 Pandemic." *Journal of Business Venturing Insights* 16: e00287. <https://doi.org/10.1016/j.jbvi.2021.e00287>.
- Treen, K., H. Williams, S. O'Neill, and T. G. Coan. 2022. "Discussion of Climate Change on Reddit: Polarized Discourse or Deliberative Debate?" *Environmental Communication* 16, no. 5: 680–698. <https://doi.org/10.1080/17524032.2022.2050776>.
- Tur, B., J. Harstad, and J. Antonakis. 2022. "Effect of Charismatic Signaling in Social Media Settings: Evidence From TED and Twitter." *Leadership Quarterly* 33, no. 5: 101476. <https://doi.org/10.1016/j.leaqua.2020.101476>.
- Um, C. T., S.-L. Guo, F. Lumineau, W. Shi, and R. Song. 2022. "The Downside of CFO Function-Based Language Incongruity." *Academy of Management Journal* 65, no. 6: 1984–2013. <https://doi.org/10.5465/amj.2019.0943>.
- United Nations. 2022. "Communicating on Climate Change." <https://www.un.org/en/climatechange/communicating-climate-change>.
- Villarroel Ordenes, F., D. Grewal, S. Ludwig, K. de Ruyter, D. Mahr, and M. Wetzels. 2019. "Cutting Through Content Clutter: How Speech and Image Acts Drive Consumer Sharing of Social Media Brand Messages." *Journal of Consumer Research* 45, no. 5: 988–1012. <https://doi.org/10.1093/jcr/ucy032>.
- Weber, E., K. Coussement, M. Büttgen, and P. Harrigan. 2026. "The Social Media Playbook for CEOs: How to Use Transformational Leadership-Oriented Language on Social Media Successfully." *Journal of Leadership Studies* 19, no. 4: e70021. <https://doi.org/10.1002/jls.70021>.
- Wu, T., J. Reynolds, B. B. Schlegelmilch, and J. Wu. 2025. "How CEOs Can Increase Public Engagement via Microblogs: The Role of CEO Gender and Content Orientation." *British Journal of Management* 36, no. 1: 130–144. <https://doi.org/10.1111/1467-8551.12830>.
- Yadav, H., A. Kumar Kar, S. Kashiramka, and N. P. Rana. 2024. "How Does Change in CEOs' Strategic Orientations in Their Social Media Communication Impact Firm Performance During Crisis? A Longitudinal Study." *Technological Forecasting and Social Change* 208: 123649. <https://doi.org/10.1016/j.techfore.2024.123649>.
- Yang, N., D. Dousios, N. Korfiatis, and K. Chalvatzis. 2024. "Mapping the Signaling Environment Between Sustainability-Focused Entrepreneurship and Investment Inputs: A Topic Modeling Approach." *Business Strategy and the Environment* 33, no. 6: 5405–5422. <https://doi.org/10.1002/bse.3748>.
- Yang, X., W. Meng, and S. Chen. 2025. "Do Images Help? The Impact of Proenvironment Photographs and Graphs in Environmental Disclosures on Investor Perceptions and Willingness to Invest." *Business Strategy and the Environment* 34, no. 1: 203–217. <https://doi.org/10.1002/bse.3992>.
- Yuan, S., and H. Lu. 2020. "'It's Global Warming, Stupid': Aggressive Communication Styles and Political Ideology in Science Blog Debates About Climate Change." *Journalism and Mass Communication Quarterly* 97, no. 4: 1003–1025. <https://doi.org/10.1177/107769902094521>.
- Yue, C. A., Y. J. Chung, T. Kelleher, A. Bradshaw, and M. A. Ferguson. 2021. "How CEO Social Media Disclosure and Gender Affect Perceived CEO Attributes, Relationship Investment, and Engagement Intention." *Journalism and Mass Communication Quarterly* 98: 584–607. <https://doi.org/10.1177/1077699020943521>.
- Yue, C. A., P. Thelen, K. Robinson, and L. R. Men. 2019. "How Do CEOs Communicate on Twitter? A Comparative Study Between Fortune 200 Companies and Top Startup Companies." *Corporate Communications: An International Journal* 24: 532–552. <https://doi.org/10.1108/CCIJ-03-2019-0031>.
- Zechiel, F., M. Blaurock, E. Weber, M. Büttgen, and K. Coussement. 2024. "How Tech Companies Advance Sustainability Through Artificial Intelligence: Developing and Evaluating an AI x Sustainability Strategy Framework." *Industrial Marketing Management* 119: 75–89. <https://doi.org/10.1016/j.indmarman.2024.03.010>.
- Zeidan, R. 2022. "Why Don't Asset Managers Accelerate ESG Investing? A Sentiment Analysis Based on 13,000 Messages From Finance Professionals." *Business Strategy and the Environment* 31, no. 7: 3028–3039. <https://doi.org/10.1002/bse.3062>.

Appendix

Appendix 1: Exemplary CEO Posts

Language use	Examples of CEO posts from Global Fortune 500 companies
Certitude in language	@ChuckRobbins @Cisco @GM Likewise! I am confident our collaboration will help accelerate #EV and #AV development to create a better world. <i>Certitude in language (9.52)</i> <i>Anxiety in language (0)</i> <i>Climate-related post (0)</i>
Anxiety in language	We must do more to support the forgotten, future generation of this country. Alarming findings from @TimesEducation show that the pandemic will have a dangerously enduring impact on young people. We cannot write them off. #socialmobility #levellingup <i>Certitude in language (0)</i> <i>Anxiety in language (2.38)</i> <i>Climate-related post (0)</i>
Climate-related post	As the climate crisis accelerates, so must action to decarbonize. Building on 20+ years of climate action, we are now committed to achieve the Net-Zero Standard across our value chain by 2040—10 years ahead of the voluntary external standard. <i>Certitude in language (0)</i> <i>Anxiety in language (0)</i> <i>Climate-related post (1)</i>
Certitude in language in climate-related posts	#Sustainability is a business imperative and must be at the core of every company's strategy. It's crucial we work together to #MoveTheDate! <i>Certitude in language (7.14)</i> <i>Anxiety in language (0)</i> <i>Climate-related post (1)</i>
Anxiety in language in climate-related posts	The @AXA #FutureRiskReport 2022 describes a world where crises are stacked on each other and confirms underlying trends such as the fear of climate change. Insurers can contribute in terms of prevention and protection. @ianbremmer @EurasiaGroup <i>Certitude in language (0)</i> <i>Anxiety in language (2.17)</i> <i>Climate-related post (1)</i>

Note: LIWC category scores for Certitude and Anxiety reflect the proportion of words in each post that belong to the respective dictionaries. Observed values range from 0 to 33.33 (Certitude) and 0 to 10 (Anxiety).

Appendix 2: Coding Scheme

Task: Please label each post as climate related or not. Each annotation should be a 0 (non-climate-related post) or 1 (climate-related post) decision.

Label 1 (climate-related post)

Description

A post is labeled *climate related* if the post is about climate change (or climate crisis or similar climate-related topics), measures to prevent/slow climate change or to deal with the results of climate change, as well as about drivers for and the impact of climate change. According to the United Nations, anthropogenic greenhouse gas emissions (i.e., human-caused greenhouse gas emissions, such as carbon dioxide [CO₂]) have increased since the pre-industrial era, primarily driven by economic and population growth, and are now at an all-time high. Climate change is increasing the frequency and intensity of extreme weather events such as heat waves, droughts, floods, and tropical cyclones, aggravating water management problems, reducing agricultural production and food security, increasing health risks, damaging critical infrastructure, and interrupting the provision of basic services such as water and sanitation, education, energy, and transport.

Source: UN Environment Programme (<https://www.unep.org/explore-topics/sustainable-development-goals/why-do-sustainable-development-goals-matter/goal-13>).

Relevant keywords regarding climate action (according to SDG Keyword Mapping)						
Climate	Climate change	Drivers of climate change	Impact of climate change	Actions to prevent/slow down climate change	Measures (and models) of climate change	Others
Climate, Regional Climate, Urban Climate	Climate Change, Climate Catastrophe, Climate Crises, Climate Variability/Climate Variation	Greenhouse Gas, Greenhouse Gas Emission(s), Greenhouse Gases Emission(s), GHG Emission, Atmospheric Carbon Dioxide, Atmospheric CO ₂ , CO ₂ equivalents (CO ₂ e), Carbon Emissions, Carbon Dioxide Emission(s), CO ₂ Emission(s), CO ₂ e Emission(s), Nitrous Oxide Emissions, N ₂ O Emissions, Climate Forcing/Radiative Forcing, Climate AND Consumption, Climate AND Production	Climate Change Impact(s), Climate Impact(s), Climate Change Effects, Climate Variation(s), Climate Change Risk(s), Climate Risk(s), Climate (Related) Hazards, Extreme Weather (Events), Climate Signal(s), Natural Disaster, Global Warming, Climate Warming, Atmosphere*, Ozone, Ocean Warming, Acidification AND Seawater, Ocean Acidification, Antarctic Cold Reversal (ACR), Anthropocene, Sea Level, Sea Level Change, Sea Level Rise, Rising Sea (Level(s)), Sealevel Rise (Slr), (Sea) Ice Loss, Ice-Ocean Interaction(s), Indian Ocean Dipole (IOD), Interdecadal Pacific Oscillation (IPO), La Niña, El Niño, El Niño-Southern Oscillation, El Niño Southern Oscillation, El Niño-Southern Oscillation, El Niño Southern Oscillation, ENSO, Nino Southern Oscillation, Nitrogen Cycle(s), Glacier Retreat	Climate Action, Impact Reduction, Climate Change Management, Climate Change Adaption (CCA), Climate Adaption, Change Adaption Strategies, Climate Adaptive Management, Climate Change Adaptation Measures, Climate Change Adaptation Planning, Climate Change Adaptation Policy (Policies), Climate Change Adaptation Strategy (Strategies), Change Adaption Strategy (Strategies), Change Mitigation, Climate Change Mitigation, Climate Change Mitigation Policy (Policies), Climate Change Mitigation Strategies, Climate AND Disaster Risk Reduction, Disaster Risk Reduction (DRR), Disaster Risk Reduction Strategies, Climate Change Planning, Climate AND Decision Making, Clean Development Mechanism (CDM), Climate Change Financing, Climate Finance, Climate Investment, Green Climate Fund, Climate Policy (Policies), Climate Change Policy (Policies), Climate Governance, Climate Justice, Climate Equity, Climate Feedback, Climate Service(s), Kyoto Protocol, Paris Agreement, COP 21, COP 22, United Nations Framework Convention on Climate Change (UNFCCC), The Sendai Intergovernmental Panel on Climate Change (IPCCC), Framework for Disaster Risk Reduction 2015–2030, Climate AND Energy Conservation, Carbon Capture/CO ₂ Capture, Climate Capitalism, Ecoclimatology, Eco-Climateology, Climate AND Bioeconomy, Climate AND Awareness, Environmental Education, Sustainable Development Education	Global Climate Model(s), GCM (GCMs), Climate Model(s)/Climate Modeling, Climate Modelling, (Average) Global Temperature/Global Modelling, Mean Temperature, Global Warming Potential (GWP), Sea Surface Temperature (SST), Acclimatization (ASTI), Carbon Footprint, Climate (Change) Early Warning, Climate AND Thermal Expansion, Climate Change Scenarios, Climate Prediction(s), Climate Tipping Point, Marine Isotope Stage (MIS), Regional Climate Model(s) (REGCM/Rcm(s)), Southern Oscillation Index (SOI)	Climate AND Food Chain(s), Climate AND Land Use, Climate AND Megacit*, Climate AND Island*, Climate AND Small Island Developing States

Label 0 (non-climate-related post)

Description

A post is labeled *non-climate related* if it is not about climate change or its impacts.

Note: A post is also labeled non-climate related if it focuses solely on renewable energy or other SDGs. If a post mentions renewable energy or other SDGs and is also climate related (as described above), it must be coded as climate related.

No specific keywords

Appendix 3: Experimental Design

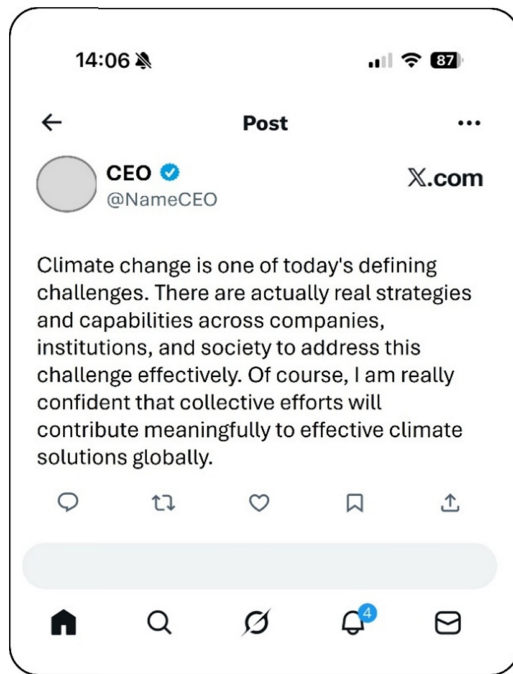
Please imagine the following situation:

You are scrolling through your feed on X. While doing so, you come across a post by the CEO of a company.

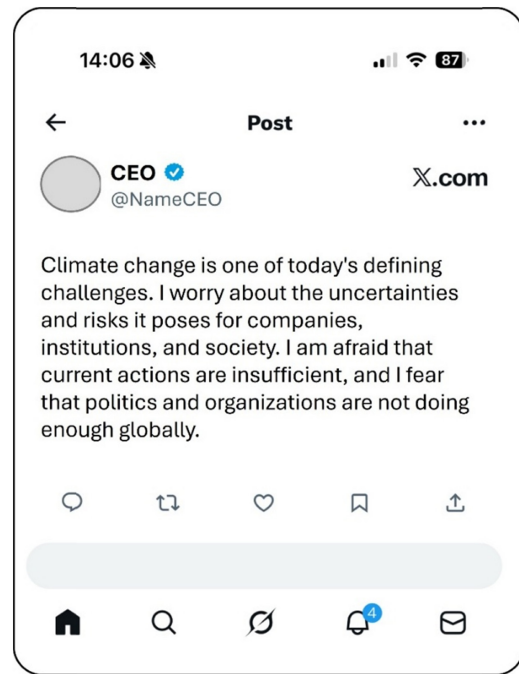
In this post, the CEO addresses topics related to climate change and the environment.

Please read the post carefully. Afterwards, you will be asked a series of questions about your perceptions of and reactions to the post.

Condition 1: Certitude in the CEO climate-related post



Condition 2: Anxiety in the CEO climate-related post



Appendix 3.1: Survey Items

Variable	Item	Scale
Attention check	Please specify the topic the CEO is posting about:	- Climate change - New product
Manipulation check	- The CEO communicates certainty in this post. - The CEO communicates in an anxious way in this post.	1 = <i>strongly disagree</i> , 7 = <i>strongly agree</i>
Attention	- This CEO's post caught my attention. - What this CEO says in the post caught my attention.	1 = <i>strongly disagree</i> , 7 = <i>strongly agree</i>
Public engagement (sharing intention)	I would <i>repost</i> the CEO's post that I've just read.	1 = <i>strongly disagree</i> , 7 = <i>strongly agree</i>
Company-related WOM	- I would say positive things about the company, run by this CEO, to others. - I would recommend the company, run by this CEO, to others. - I would recommend the company, run by this CEO, to someone who seeks my advice.	1 = <i>strongly disagree</i> , 7 = <i>strongly agree</i>
Investment intention	- I would be interested in investing in the company run by this CEO. - I would invest in the company run by this CEO	1 = <i>strongly disagree</i> , 7 = <i>strongly agree</i>

Variable	Item	Scale
Concern about climate change	- How concerned, if at all, are you about climate change, sometimes referred to as 'global warming'? - Considering any potential effects of climate change which there might be on you personally, how concerned, if at all, are you about climate change? - Considering any potential effects of climate change there might be on society in general, how concerned are you about climate change?	0 = <i>not at all concerned</i> ; 7 = <i>very concerned</i>
Frequency of X usage	How often do you use X (formerly Twitter)?	0 = <i>never</i> ; 7 = <i>frequently</i> (i.e., at least once a day)
Frequency of posting	How often do you post on X?	
Frequency of sharing	How often do you engage with content on X by <i>sharing</i> it?	
Age	How old are you? (in years?)	
Gender	Which gender do you identify with the most?	- Woman - Man - Non-binary - Prefer not to say
Educational level	What is your highest educational qualification?	- No formal qualification - Secondary school (e.g., high school diploma) - Vocational training/apprenticeship - Bachelor's degree - Master's degree - Doctorate/PhD - Other (please specify):