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Us vs. them: moral, cognitive and affective language in group identity tweets

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Highlights:

- Nonviolent groups used more trust and positive emotion language in group identity tweets than violent groups.
- Violent groups used more discrepancy-related cognitive language in group identity tweets, signaling dissatisfaction and aspirations.
- In group identity tweets, left-leaning groups used more care-related moral language than right-leaning groups.
- Right-leaning groups used more sanctity-related moral language in group identity tweets than left-leaning groups.
- Patterns in affective, cognitive, and moral language in group identity tweets vary based on violence and ideology.

Abstract

Ideological groups leverage Twitter (now X) to cultivate strong group identities that sustain membership and foster intergroup hostility. Their positions may differ on the left-right political spectrum and their propensity for violence. Although all ideological groups develop strong group identities, research suggests that the language used to develop these identities may vary across different types of groups. This study investigates the use of affective, cognitive, and moral language in group identity tweets – those tweets that include first- and third-person plural pronouns (e.g., "us", "them") – from diverse ideological groups. This study found that nonviolent groups use trust and positive emotions more than violent groups in group identity tweets, whereas violent groups use discrepancy to a greater extent. Left-leaning groups use care (virtue and vice) to a greater extent than right-leaning groups, and the latter use sanctity (virtue) more. Implications of these findings are discussed.

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1. Introduction

Extremism on social media platforms like Twitter (now X) has captured national and global attention, as ideological groups use the platform for purposes ranging from community-building to disseminating hate, radical beliefs, and calls for violence (Holbrook, 2015; The New York Times, 2022). Understanding how violent and nonviolent ideological groups differ in their online presence and influence is crucial, particularly as such groups target vulnerable populations with messages that perpetuate division and hatred (Connelly et al., 2016). The reach of these groups extends beyond their immediate followers, influencing the broader public and young people in particular, who are more susceptible to radicalization through exposure to extreme online content (Bene, 2017; Sugihartati et al., 2020). By exploiting individuals' psychological and social needs, such content can foster group membership tied to extreme ideologies and even incite offline violence (Gallacher et al., 2021; Ward, 2020).

While shared beliefs may initially attract individuals to these groups, they can cultivate strong group identities that sustain membership and foster intergroup hostility (Long, 2023). Group identity can deepen division, as members adopt an "us versus them" mindset, leading to prejudice and aggression toward out-groups (Mason, 2018; Rousseau, 1998; Merrilees et al., 2013; Rains et al., 2017). Ideological groups, regardless of their ideological orientation or propensity for violence are adept at leveraging this dynamic by emphasizing social identities through first- and third-person plural pronouns (e.g., "we," "us," "they," "them"), which intensify group affiliation and delineate out-groups (Eastman, 2016; Iyengar et al., 2012).

The linguistic cues employed with these pronouns also play a pivotal role in fostering group identity and perpetuating polarization (Long & Crabtree, 2024; Martinez-Ebers et al., 2021). Ideological groups strategically use emotional language to generate affective commitment, cognitive language to shape cause-and-effect narratives, and moral language to frame issues as matters of right and wrong (Ness et al., 2017; Sterling & Jost, 2018). However, violent and nonviolent groups on both sides of the ideological spectrum emphasize these language types differently, reflecting their distinct core values and strategies (Angie et al., 2011; Graham et al., 2009). In fact, experts have cautioned against treating "extremism" as a homogenous phenomenon, noting that different groups leverage social media in nuanced ways (Freelon et al., 2022; Jamte & Ellesen, 2020). It remains unclear whether differences in these linguistic patterns extend to group identity tweets that explicitly focus on identity formation through group-oriented pronouns and related language. Given the prevalent use of social identity language in these groups' messaging to promote social categorization (Tajfel, 1978; Eastman, 2016; Rousseau, 1998) and influence social media platform users (Jensen, et al., 2023), it is important to understand how the nuanced use of affective, cognitive, and moral language extends to these messages.

To address this gap, we explore how ideological groups use language to construct and communicate group identity on Twitter, examining differences in affective, cognitive, and moral language across two key dimensions: violence and political orientation. Specifically, we investigate how violent and nonviolent groups differ in using emotional appeals, reasoning strategies, and moral framing. We also assess how left-leaning and right-leaning groups vary in these same linguistic patterns. By analyzing these distinctions within group identity tweets, we aim to understand better the rhetorical mechanisms ideological groups use to engage audiences, foster cohesion, and reinforce ideological boundaries. This study offers practical insights into the nuanced linguistic strategies used by ideological groups to construct and communicate group identity online. By identifying how violent and nonviolent groups across both sides of the ideological spectrum differ in their use of affective, cognitive, and moral language, the findings can inform the development of tailored counter-narratives and interventions to mitigate polarization and prevent radicalization. Furthermore, focusing specifically on group identity tweets, this research highlights how ideological groups foster in-group cohesion and out-group hostility, providing a foundation for more targeted social media content moderation policies. These findings can also guide platform algorithms to detect and address harmful content better while supporting policymakers and educators in designing programs addressing the psychological and social needs these groups exploit to attract and radicalize members.

Ideological Groups and Social Identity

Ideological groups are individuals united by shared beliefs, values, and goals, which serve as frameworks for interpreting and responding to events (Angie et al., 2011; Van Dijk, 2013). These groups provide members with meaning, self-esteem, social identity, and certainty, fulfilling fundamental psychological needs (Aberson et al., 2000; Hogg, 2003). While some ideological groups promote prosocial goals, such as peace, social justice, and human rights, others advocate for exclusionary ideologies and, in some cases, support or justify the use of

violence to achieve their objectives. These violent ideological groups often target individuals based on demographic characteristics, contributing to the rise of hate crimes in the United States (Connelly et al., 2016; FBI, 2019; SPLC, 2021). For the purposes of this study, ideological groups were categorized as violent or non-violent based on publicly available materials and organizational designations from watchdog groups (e.g., SPLC, FBI), academic literature, and evidence of promoting or engaging in violence in pursuit of their aims.

Political ideologies, while multifaceted, are often organized along a left–right continuum, particularly in Western political contexts such as the United States, where this framework is commonly used to classify values and policy preferences (Jost, 2006). Left-leaning ideologies in the U.S. context generally emphasize equality, social justice, and progressive reform, including anti-capitalism, environmental advocacy, and anti-imperialism (Coopsey & Merrill, 2020). In contrast, right-leaning ideologies prioritize tradition, authority, and free-market principles, often highlighting nationalism, ethnocentrism, and the preservation of traditional social hierarchies (Graham et al., 2015; Jost et al., 2009). We acknowledge that these political terms are culturally dependent and context-specific, and our usage reflects their predominant meanings in U.S. sociopolitical discourse. Ideological groups on both ends of the spectrum use their ideological tenets to attract and engage members. Social media platforms like Twitter play a critical role in this process, providing a medium for disseminating narratives, fostering group identity, mobilizing demonstrations, recruiting members, and coordinating violent actions (Conway, 2017).

Social identity is central to ideological groups' communication, recruitment, and retention strategies. These groups aim to develop a collective sense of belonging among members and create distinct boundaries between themselves and out-groups. Online communications, such as tweets referencing "we/us" to indicate in-group cohesion or "they/them" to delineate outsiders, are particularly effective in promoting group identity. We refer to these as *group identity tweets*. By priming individuals to think in terms of "we" and "they," ideological groups foster a dichotomy that strengthens in-group solidarity while reinforcing intergroup distinctions (Eastman, 2016; Fiol, 2002). Inclusive pronouns ("we/us") signal shared values and unity. In contrast, exclusive pronouns ("they/them") highlight division and potential antagonism, fostering positive attitudes toward the in-group and negative perceptions of out-groups (Brewer & Gardner, 1996; LeVine & Campbell, 1973).

Research shows that group identity formation is vital for attracting members who share aligned identities or experience identity uncertainty, characterized by confusion about who they are and how to behave. This process provides clarity and structure, particularly appealing to individuals in uncertain or transitional life phases (Hogg, 2003). While identification with a group does not inherently lead to violence, strongly identifying with a group under perceived threats can increase the likelihood of hostile behaviors toward out-groups (Fischer et al., 2010; Merrilees et al., 2013). Social identity thus shapes situational appraisals, emotions, and behaviors, becoming a powerful tool for intragroup cohesion and out-group antagonism, especially in conditions of perceived threat to the group (De Cremer & van Vugt, 1999; Iyengar et al., 2012).

Ideological groups across the political spectrum rely on group identity communication (i.e., via tweets) to engage their audiences, construct a collective identity, and mobilize support. This process is not confined to one end of the ideological spectrum or a particular level of violence; instead, it reflects a shared strategy to unify members, reinforce group boundaries, and amplify their ideological messages. By examining group identity tweets, this study explores how these groups employ language to foster social identity and maintain influence in online spaces.

Affective, Cognitive, and Moral Language in Group Identity Tweets

Affective, cognitive, and moral language are powerful tools to strengthen social identity and foster group cohesion. According to social identity theory, individuals derive a significant portion of their self-concept from their membership in social groups (Tajfel & Turner, 1979). This social identity can be strengthened through language that emphasizes shared values, goals, and group membership, as well as distinctions between "us" and "them" (Brewer & Gardner, 1996). Identity uncertainty theory suggests that individuals who experience uncertainty about their social identity are particularly susceptible to the influence of groups that provide clarity and structure (Hogg, 2007). By using affective, cognitive, and moral language, ideological groups create a sense of belonging, reinforce ideological boundaries, and reduce identity uncertainty for their followers. These strategies help shape individuals' perceptions of themselves as part of a larger collective, while simultaneously demarcating the in-group from out-groups.

The specific use of affective, cognitive, and moral language in ideological group messaging is expected to vary significantly based on the group's ideological orientation and propensity for violence. Violent groups are often motivated by a sense of existential threat and a desire to protect or advance their worldview through

forceful means, which may lead them to employ more emotionally charged, morally justified, and ideologically certain language (Matsumoto et al., 2012; Knight et al., 2022). For example, violent groups may use affective language to evoke anger or fear, cognitive language to justify their violent actions as a means of self-defense or cultural preservation, and moral language to justify violence as a moral imperative to protect the in-group (Byrne et al., 2013; Brownlow et al., 2020). Nonviolent groups, on the other hand, may focus more on positive emotional appeals, ideological clarity, and moral language that promotes justice and equality without resorting to violence (Scrivens et al., 2022). Similarly, left- and right-leaning groups emphasize different moral and cognitive frameworks to justify their actions and beliefs, with left-leaning groups typically stressing fairness and inclusivity, while right-leaning groups focus on loyalty, authority, and tradition (Graham et al., 2009; Hahn et al., 2019). Understanding how these ideological and violent distinctions manifest in group identity tweets is crucial for identifying patterns in extremist rhetoric.

Affective Language and Group Identity

Affective language refers to words that express or elicit emotion, serving to evoke responses such as anger, fear, or trust. Ideological groups use affective language to amplify engagement, reinforce in-group cohesion and evoke emotional reactions toward perceived out-groups. For instance, words associated with “disgust” or “pride” can powerfully shape group sentiment and boundary-making. Many ideological groups on the Internet take advantage of this emotional influence, using positive and negative emotional language to draw individuals closer to their causes and away from competing ideologies (Dunbar et al., 2014).

More extreme ideological groups, especially those sanctioning violence and hate, frequently use negative emotions such as fear, anger, and disgust in their online communication (Byrne et al., 2013; Ness et al., 2017). This emotional intensity serves to rally members and legitimize violent actions, framing them as righteous and necessary for group survival. Prior research suggests that violent extremists frequently use fear appeals and expressions of personal crisis or victimization to justify their violence, portraying their group as under siege (Knight et al., 2022; Byrne et al., 2013). These emotional appeals heighten group identification by creating a shared sense of urgency. Their expression increases immediately before acts of violence, suggesting that these emotions are instrumental in inciting groups to commit violence (Matsumoto et al., 2012).

In contrast, nonviolent ideological groups may use less aggressive forms of affective language, focusing more on feelings of injustice or exclusion rather than fear or disgust. These groups may evoke anger or resentment, but do so in a way that emphasizes ideological purity and the need for peaceful resistance (Scrivens et al., 2022). While they may still engage in emotionally evocative language, nonviolent groups typically avoid the more direct calls for violent action seen in their violent counterparts.

Research Question 1: How does affective language in group identity tweets differ between violent and nonviolent ideological groups?

Further distinctions in affective language may emerge across political orientations. Left-leaning ideological groups often use emotionally intense language to rally disadvantaged populations against perceived oppression and inequality, frequently expressing solidarity and collective resistance (Choi et al., 2023). These groups might emphasize themes of justice, equality, and collective action, using emotionally evocative language to inspire hope and mobilize for social change. Given their greater openness to experience and higher self-esteem, more positive themes may emerge in their communications (Jost et al., 2003).

Conversely, right-leaning ideological groups will likely frame their emotional appeals to defend traditional values, national identity, and social order. Their affective language may center more on fear of societal collapse or moral decay, evoking anger and anxiety over the perceived threats posed by out-groups (Schlenker et al., 2012). Fear may be particularly present in their online messaging given their higher death anxiety and greater fear of threat and loss (Jost et al., 2003).

Research Question 2: How does affective language in group identity tweets differ between left-leaning and right-leaning ideological groups?

Cognitive Language and Group Identity

Cognitive language involves terms that indicate through processes, including reasoning, explanation, uncertainty, and causal attribution. This type of language helps ideological groups structure narratives that interpret events in line with their worldview – often by attributing blame, highlighting certainty, or contrasting alternative viewpoints. Violent ideological groups often use cognitive language to rationalize their violent actions, framing them as necessary for the protection or advancement of the group’s ideology. These groups are likely to employ language that emphasizes certainty, moral superiority, and the justification of violence,

often framing their actions as a response to perceived existential threats (Brownlow et al., 2020; Kruglanski, 1989). Cognitive appeals may include claims of historical inevitability or the need for violent resistance to preserve the group's values, reinforcing a sense of certainty and resolve.

Nonviolent ideological groups, while still using cognitive language to promote their worldview, are less likely to frame their ideology in terms of violent resistance. Instead, they may focus more on ideological clarity and the need for peaceful action to address perceived injustices. However, cognitive language in nonviolent groups may still reflect strong ideological commitment, as they attempt to present a unified narrative about societal problems and solutions (Kruglanski, 2004). These groups may emphasize cognitive dissonance reduction, framing their cause as morally justified despite the lack of violent action.

Research Question 3: How does cognitive language in group identity tweets differ between violent and nonviolent ideological groups?

Left-leaning ideological groups are likely to use cognitive language that emphasizes causality and insight to explain societal issues, particularly systemic inequalities and injustices. Their cognitive framing often highlights the root causes of societal problems, such as capitalism, discrimination, or environmental degradation, and uses language that stresses the need for structural change and collective action to address these issues (Choi et al., 2023; Pliskin et al., 2014). These groups are more likely to use tentative language when discussing potential solutions, emphasizing uncertainty and the need for continued dialogue and reform to achieve social justice. Cognitive language in left-leaning ideological groups may also highlight discrepancies in the current social system, identifying the gap between societal ideals and the realities faced by marginalized populations.

In contrast, right-leaning ideological groups often use cognitive language to emphasize the causes and consequences of perceived societal threats, such as the erosion of traditional values, national identity, or cultural heritage. Their cognitive framing tends to focus on certainty and the inevitability of conflict or societal collapse unless strong measures are taken to preserve the in-group and its values (Jost et al., 2003; Webber et al., 2018). Right-wing extremists are likely to employ more decisive and confident language, framing issues as clear-cut and stressing the need for strong action to protect the in-group from external and internal threats. They may also highlight discrepancies between the idealized traditional values and the perceived moral decay in contemporary society. This use of cognitive language reinforces a sense of urgency and in-group cohesion, as right-leaning ideological groups often portray themselves as the defenders of societal order and cultural purity (Graham et al., 2009).

Research Question 4: How does cognitive language in group identity tweets differ between left-leaning and right-leaning ideological groups?

Moral Language and Group Identity

Moral language frames actions, events, or groups in terms of right and wrong, justice and injustice. It draws on shared moral values (e.g., fairness, loyalty or purity) to legitimize the group's actions and condemn those of opposing groups. Unlike affective language, which targets emotion, or cognitive language, which targets understanding, moral language targets judgment and obligation, portraying behaviors or beliefs as virtuous or corrupt. Violent ideological groups often invoke moral language to justify violence, particularly by appealing to binding moral foundations like loyalty, authority, and sanctity (Coady, 2004; Graham & Haidt, 2012). These groups may downplay individualizing moral foundations such as care and fairness, instead emphasizing the moral imperative to defend the group and its values, even at the cost of violating ethical principles (Hahn et al., 2019). Moral language in violent ideological groups frequently portrays violence as a necessary evil to uphold cultural purity or societal order, often justifying harm to out-group members as a means of protecting the in-group (Hahn et al., 2024).

Nonviolent ideological groups, on the other hand, may still use moral language but are more likely to emphasize individualizing moral foundations, such as care, fairness, and justice (Paruzel-Czachura et al., 2023). These groups focus on framing their ideology as a morally superior alternative to mainstream societal norms, appealing to empathy and fairness to promote social change without violence. While they may still highlight out-group moral failings, the moral language in nonviolent groups typically focuses more on ideological purity and peaceful resistance than justifying harm.

Research Question 5: How does moral language in group identity tweets differ between violent and nonviolent ideological groups?

Across political orientations, left-leaning ideological groups are more likely to emphasize individualizing moral foundations, such as care and fairness, to justify their activism and critique of existing power structures.

These groups frame their cause regarding human rights, equality, and justice, often using moral language to highlight the importance of fairness and the rights of marginalized groups. In contrast, right-leaning ideological groups emphasize binding moral foundations, particularly loyalty and sanctity, which support their focus on preserving traditional values and resisting perceived threats to societal stability (Graham et al., 2009). Their moral language often stresses the importance of protecting the in-group from the moral decay and existential threats posed by out-groups.

Research Question 6: How does moral language in group identity tweets differ between left-leaning and right-leaning ideological groups?

By examining the use of affective, cognitive, and moral language in group identity tweets, this study provides insight into how different ideological groups—violent and nonviolent, left-leaning and right-leaning—employ language to construct social identities, mobilize support, and legitimize their causes. The differences in language use are critical for understanding the dynamics of online extremism and the role of social media in fostering group cohesion and ideological polarization.

2. Method

Sample

The sample consisted of 172 Twitter users representing 62 ideological groups. Among these, 124 were linked to nonviolent groups and 48 to violent groups; 45 were associated with left-leaning groups and 127 with right-leaning groups; and 53 group accounts, 39 leader accounts, and 80 prominent member accounts. The identification of the groups was based on information from the Southern Poverty Law Center's (SPLC) Hatewatch blog, a report on left-wing extremism prepared for the U.S. Department of Energy (Seger, 2001), the Counter Extremism Project, and the Armed Conflict Location & Event Data (ACLED) Project. From the SPLC and ACLED sites and searching news media, we identified these groups' leaders and prominent members. We searched for the Twitter accounts of the groups, their leaders, and prominent members, and each user downloaded the most recent 3,200 tweets, the maximum retrievable via the Twitter API, in January 2023 using Node XL (Smith et al., 2010). As a result, the tweet dataset spans from 2009 to late 2022, depending on each user's posting frequency. This period encompassed major sociopolitical events, including national elections, racial justice protests, and the COVID-19 pandemic, which likely influenced tweet themes and engagement.

Since our focus is group identity tweets, we retained only tweets that contained a score greater than zero for either "we" pronouns (e.g., we, us, our) or "they" pronouns (e.g., they, their, them) features of the Linguistic Inquiry and Word Count program (LIWC; Tausczik & Pennebaker, 2010). LIWC provides a proportion of words relevant to the "we" and "they" categories relative to the number of words in each tweet. This process reduced the dataset to tweets referencing collective identity and out-group distinctions. We calculated the aggregate LIWC score for "we" and "they" features at the user level across all qualifying tweets. Each user received a unique identification number, group affiliation code, and classifications for violence, ideological stance, and role (group, leader, or member), as described below.

Group Classification

Violence distinction was determined through a Factiva article search from 2016 to 2022 containing group names and a search string of 37 words indicative of violence (e.g., attack, kill, violence, armed). A set of 3 trained content coders read the articles and recorded the group's name, the article's date, the source of information, the violent event date, and the event description. Any group involved in at least one crime was classified as violent. Additionally, to determine the political position of these groups (right- or left-leaning), information from the SPLC and the Twitter accounts affiliated with the ideological groups was used.

Measuring Affective, Cognitive, and Moral Language

Affective language was assessed using the NRC Emotion Lexicon via the Syuzhet package in R, which classifies words according to Plutchik's (2001) eight core emotions: anticipation, joy, trust, fear, surprise, sadness, disgust, and anger. Each tweet was scored on the presence and intensity of these emotion categories. Tweets containing one or more emotion-related terms received non-zero values, indicating affective content.

Cognitive language was assessed using six cognitive process categories from LIWC: insight, causality, discrepancy, tentativeness, certainty, and differentiation (Tausczik & Pennebaker, 2010). These categories reflect the extent to which tweets contain language associated with reflection, reasoning, or contrasting perspectives.

Moral language was assessed using the Moral Foundations Dictionary (MFD; Graham et al., 2009), implemented in LIWC. This dictionary includes terms tied to five foundational moral domains—care, fairness, loyalty, authority, and sanctity—classified as either virtue (morally approved) or vice (morally condemned). Tweets containing one or more terms from these categories were scored based on their proportion relative to tweet length.

While these linguistic categories are not mutually exclusive and may co-occur within a tweet (e.g., a moral condemnation that also evokes anger), they serve distinct psychological and rhetorical purposes. Our analytic approach treats them as independent but not exclusive dimensions, enabling us to detect the primary emphasis of each tweet. To mitigate interpretive ambiguity, we apply lexicons validated in prior research and focus on patterns at the user/group level rather than isolated lexical choices. We also contextualized interpretation of scores by reviewing representative tweet samples to ensure that terms were used in ideologically consistent ways (e.g., "loyalty" invoked as a moral virtue vs. sarcastic critique).

Covariate – User Role

Prior research indicates that different roles within ideological groups behave differently, including in their online communication (Jasko & LaFree, 2020; Phadke & Mitra, 2021). Therefore, user roles, including official group accounts, leaders, and prominent members were categorized. Prominent members included any members with key roles other than group leader (e.g., legal counsel, VP of operations, speaker). The reason behind the exclusion of group followers is that we are interested in the linguistic strategies employed by organizations and/or their representatives.

3. Results

Table 1 provides a summary of research questions and key findings. Table 2 displays descriptive statistics for the study variables for the overall sample, as well as for violent and nonviolent affiliation, and right- and left-leaning groups, separately (see supplemental materials for correlations between study variables).

Table 1. Summary of research questions and results

Research Questions	Results
RQ1: How does affective language in group identity tweets differ between violent and nonviolent extremist groups?	Nonviolent: higher trust and positive affect scores
RQ2: How does affective language in group identity tweets differ between left-leaning and right-leaning extremist groups?	No significant differences
RQ3: How does cognitive language in group identity tweets differ between violent and nonviolent extremist groups?	Violent: higher discrepancy scores
RQ4: How does cognitive language in group identity tweets differ between left- and right-leaning extremist groups?	No significant differences
RQ5: How does moral language in group identity tweets differ between violent and nonviolent extremist groups?	No significant differences
RQ6: How does moral language in group identity tweets differ between left-leaning and right-leaning extremist groups?	Left-leaning: higher care scores Right-leaning: higher sanctity scores

Hierarchical linear modeling (HLM) was used to study the effects of role, violence classification, and political ideology while accounting for the clustered data structure (Raudenbush & Bryk, 2002). The dataset for this analysis had two levels: 172 users (level 1) nested within 62 groups (level 2). Each user had an average score for each language variable across all tweets scraped from their account, serving as the level 1 data. User role served as a level 1 covariate. At level 2, violence classification and political ideology served as group features. Statistical analysis was carried out using R 2024.04.0 (R Core Team, 2024), the *lme4* (*v*1.1-35.3; Bates, et al., 2015), the *GLMMadaptive* (*v*0.9-1; Rizopoulos, 2023) packages and the *r2mlm* package (Shaw, et al., 2023). Interclass correlations (ICC) were calculated for each social identity variable to assess the proportion of variance in the use of those languages accounted for by group membership. ICC ranges from 0 to 1, where a coefficient close to 1 means that a large proportion of the variation in the outcome can be explained by which group a person belongs to, rather than individual differences within the group.

Table 2. *Means* and standard deviations for study variables for the overall sample, users affiliated with nonviolent, violent, right- and left-leaning ideological groups

	Overall		Nonviolent		Violent		Right-leaning		Left-leaning	
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
We/us	3.57	1.45	3.51	1.34	3.74	1.71	3.45	1.40	3.93	1.55
They/them	2.09	1.11	2.00	1.05	2.30	1.23	2.23	1.19	1.69	0.72
Insight	1.39	0.76	1.36	0.80	1.46	0.64	1.40	0.84	1.38	0.48
Cause	1.32	0.66	1.32	0.58	1.32	0.84	1.37	0.71	1.17	0.43
Discrepancy	1.33	0.70	1.26	0.55	1.52	0.98	1.38	0.75	1.21	0.55
Tentativeness	1.55	0.75	1.54	0.76	1.55	0.71	1.49	0.74	1.71	0.74
Certainty	1.20	0.59	1.18	0.55	1.24	0.70	1.21	0.62	1.17	0.51
Differentiation	2.08	1.46	2.05	1.59	2.17	1.04	2.06	1.61	2.14	0.92
Perception	1.66	0.89	1.54	0.67	1.96	1.26	1.61	0.96	1.80	0.65
Anticipation	0.68	0.25	0.69	0.27	0.65	0.22	0.68	0.27	0.68	0.21
Disgust	0.32	0.20	0.32	0.19	0.33	0.21	0.33	0.21	0.31	0.14
Fear	0.76	0.34	0.77	0.34	0.74	0.34	0.74	0.37	0.83	0.22
Joy	0.53	0.26	0.54	0.26	0.51	0.24	0.54	0.28	0.51	0.17
Sadness	0.46	0.22	0.47	0.23	0.46	0.20	0.46	0.24	0.48	0.15
Surprise	0.31	0.14	0.32	0.14	0.28	0.14	0.31	0.15	0.30	0.12
Trust	1.04	0.46	1.09	0.48	0.92	0.40	1.05	0.51	1.00	0.28
Negative	1.02	0.43	1.03	0.44	1.00	0.40	1.00	0.48	1.08	0.27
Positive	1.49	0.59	1.56	0.62	1.33	0.46	1.47	0.62	1.55	0.50
Anger	0.58	0.28	0.58	0.28	0.58	0.31	0.56	0.31	0.64	0.18
Care virtue	0.51	0.44	0.50	0.36	0.55	0.60	0.46	0.33	0.65	0.65
Care vice	0.55	0.40	0.52	0.38	0.62	0.46	0.48	0.36	0.74	0.45
Fairness virtue	0.28	0.38	0.30	0.40	0.21	0.30	0.31	0.42	0.17	0.14
Fairness vice	0.15	0.18	0.14	0.17	0.19	0.20	0.16	0.20	0.13	0.09
Loyalty virtue	0.78	0.92	0.71	0.52	0.96	1.52	0.74	1.04	0.87	0.41
Loyalty vice	0.03	0.06	0.03	0.07	0.03	0.05	0.04	0.07	0.02	0.04
Authority virtue	0.66	0.43	0.69	0.45	0.57	0.37	0.68	0.47	0.61	0.30
Authority vice	0.17	0.26	0.18	0.25	0.15	0.30	0.19	0.30	0.12	0.08
Sanctity virtue	0.50	0.67	0.54	0.69	0.39	0.60	0.61	0.74	0.19	0.21
Sanctity vice	0.23	0.23	0.22	0.24	0.23	0.21	0.21	0.22	0.28	0.26

Note. Overall n = 172; Nonviolent n = 124; Violent n = 48; Right-leaning n = 127; Left-leaning n = 45.

For affective language, anticipation (ICC=0.184), disgust (ICC=0.404), fear (ICC=0.198), joy (ICC=0.233), sadness (ICC=0.191), surprise (ICC=0.218), trust (ICC=0.069), anger (ICC=0.303), general negative affect (ICC=0.385), and general positive affect (ICC=0.224) were evaluated. Providing insight on research questions one and two, violence classification significantly predicted the use of trust appeals (β = -0.219, p < .05, R^2_{fvm}=0.147) and general positive affect appeals (β = -0.323, p < .05, R^2_{fvm}=0.237), while the effect of role was controlled at level 1. The results suggest that nonviolent groups leverage trust (Figure 1) and positive affect (Figure 2) more than violent groups in their group identity tweets. Political ideology did not significantly predict affective language in group identity tweets. See Table 3 for full results.

For cognitive language, insight (ICC=0.319), cause (ICC=0.123), discrepancy (ICC=0.283), tentativeness (ICC=0.463), certainty (ICC=0.196), and differentiation (ICC=0.187) were evaluated. Addressing research questions three and four, violence classification significantly predicted discrepancy use (β = 0.374, p < .05, R^2_{fvm}=0.322) while the effect of role was controlled at level 1. This suggests that violent groups employ discrepant language (i.e., hedging language such as “would” or “could”) more than nonviolent groups in group identity tweets (Figure 1). Political ideology did not significantly predict cognitive language in group identity tweets.

Finally, for moral language, care virtue (ICC=0.243), care vice (ICC=0.604), fairness virtue (ICC=0.280), fairness vice (ICC=0.114), loyalty virtue (ICC=0.154), loyalty vice (ICC=0.310), authority virtue (ICC=0.131), authority vice (ICC=0.222), sanctity virtue (ICC=0.391), and sanctity vice (ICC=0.312) were evaluated. For some moral language features, the distribution was positively skewed, thus a gamma distribution was imposed where appropriate. Addressing research questions five and six, violence classification did not significantly predict moral language in group identity tweets. On the other hand, political ideology significantly predicted care virtue (β = 0.229, p < .05, R^2_{fvm}=0.248), care vice (β = 0.256, p < .05, R^2_{fvm}=0.601), and sanctity virtue (β = -1.18, p < .01, R^2_{fvm}=0.163) language. The results suggest that left-leaning groups use caring virtues (i.e., compassion; Figure

2) and vices (i.e., neglect) more than right-leaning groups in group identity tweets. Right-leaning groups use sanctity virtues (i.e. purity) more than left-leaning groups in group identity tweets. See Table 5 for full results.

Table 3. HLM results for emotion language

Variables	Anticipation			Trust			Joy			Surprise		
	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)	Model 5 (β)	Model 6 (β)	Model 7 (β)	Model 8 (β)	Model 9 (β)	Model 10 (β)	Model 11 (β)	Model 12 (β)
Intercept	**0.71****	**0.71****	**0.70****	**1.10****	**1.19****	**1.20****	**0.58****	**0.59****	**0.60****	**0.28****	**0.28****	**0.26****
Level 1												
Role	-0.02	-0.01	-0.01	-0.04	-0.05	-0.07	-0.03	-0.02	-0.03	0.01	0.02	0.02
Level 2												
Violence		-0.07			**-0.22***			-0.07			-0.04	
Ideology			-0.02			-0.12			-0.05			0.00
AIC	31.44	36.49	37.87	239.36	237.00	240.99	36.27	38.19	38.82	-172.96	-163.01	-161.95
BIC	50.25	32.14	53.52	258.18	252.65	256.64	55.08	53.84	54.46	-154.14	-147.36	-146.30
R^2_{fvm}	0.393	0.214	0.192	0.112	0.147	0.065	0.342	0.265	0.236	0.280	0.255	0.247

Note. N = 172. Role is coded 1 = group account, 2 = prominent member, 3 = leader; Violence is coded 0 = nonviolent, 1 = violent; Ideology is coded 0 = right-leaning, 1 = left- leaning. $^{**}p < 0.01$; $^{*}p < 0.05$. R^2_{fvm} indicates the total proportion of the variance in the DV explained by the model.

Variables	Disgust			Sadness			Fear			Anger		
	Model 13 (β)	Model 14 (β)	Model 15 (β)	Model 16 (β)	Model 17 (β)	Model 18 (β)	Model 19 (β)	Model 20 (β)	Model 21 (β)	Model 22 (β)	Model 23 (β)	Model 24 (β)
Intercept	**0.31****	**0.28****	**0.30****	**0.48****	**0.48****	**0.48****	**0.74****	**0.76****	**0.68****	**0.59****	**0.58****	**0.56****
Level 1												
Role	0.01	0.02	0.02	-0.01	-0.01	-0.01	-0.00	-0.01	0.02	-0.01	-0.01	-0.00
Level 2												
Violence		0.01			-0.01			-0.03			-0.03	
Ideology			-0.02			0.00			0.10			0.02
AIC	-67.69	-64.93	-65.34	-17.42	-14.46	-14.76	130.31	132.04	130.54	64.25	68.37	68.24
BIC	-48.88	-49.28	-49.69	1.39	1.19	0.89	149.12	147.69	146.19	83.07	84.02	83.89
R^2_{fvm}	0.484	0.409	0.412	0.188	0.208	0.207	0.228	0.212	0.201	0.421	0.321	0.312

Variables	Positive Affect			Negative Affect		
	Model 25 (β)	Model 26 (β)	Model 27 (β)	Model 28 (β)	Model 29 (β)	Model 30 (β)
Intercept	**1.67****	**1.75****	**1.62****	**1.02****	**1.04****	**1.00****
Level 1						
Role	-0.11	-0.10	-0.07	-0.02	-0.02	-0.02
Level 2						
Violence		**-0.32***			-0.05	
Ideology			0.02			0.05
AIC	314.75	312.28	318.72	204.09	204.54	204.26
BIC	333.57	328.28	334.37	222.90	220.19	219.91
R^2_{fvm}	0.317	0.237	0.218	0.389	0.399	0.397

Note. N = 172. Role is coded 1 = group account, 2 = prominent member, 3 = leader; Violence is coded 0 = nonviolent, 1 = violent; Ideology is coded 0 = right-leaning, 1 = left-leaning. $^{**}p < 0.01$; $^{*}p < 0.05$. R^2_{fvm} indicates the total proportion of the variance in the DV explained by the model.

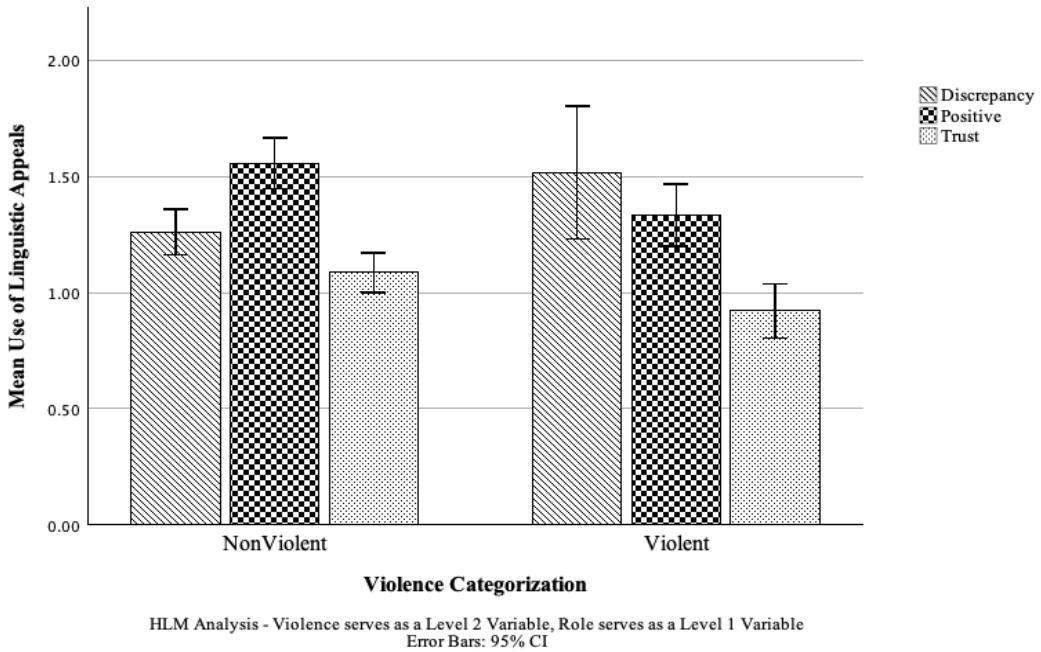

Figure 1. Use of Discrepancy, Positive Affect, and Trust Language in the Group Identity Tweets of Violent and Non-Violent Groups

Table 4. HLM results for cognitive language

Variables	Insight			Cause			Discrepancy			Tentativeness		
	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)	Model 5 (β)	Model 6 (β)	Model 7 (β)	Model 8 (β)	Model 9 (β)	Model 10 (β)	Model 11 (β)	Model 12 (β)
Intercept	**1.27****	**1.33****	**1.37****	**1.14****	**1.09****	**1.24****	**1.53****	**1.41****	**1.73****	**1.91****	**1.90****	**1.91****
Level 1												
Role	0.04	0.02	0.01	0.09	0.10	0.06	-0.09	-0.08	-0.16	**-0.21***	**-0.19***	**-0.19***
Level 2												
Violence		0.08			0.10			**0.37***			0.00	
Ideology			-0.02			-0.15			-0.33			-0.02
AIC	356.43	406.56	406.46	351.90	359.82	359.06	371.54	371.30	373.25	366.74	371.79	371.52
BIC	375.24	422.21	422.11	370.71	375.47	374.71	390.35	386.95	388.89	385.55	387.44	387.17
R^2_{fvm}	0.753	0.330	0.333	0.269	0.190	0.119	0.363	0.322	0.300	0.588	0.466	0.465

Note. N = 172. Role is coded 1 = group account, 2 = prominent member, 3 = leader; Violence is coded 0 = nonviolent, 1 = violent; Ideology is coded 0 = right-leaning, 1 = left-leaning. **p < 0.01; *p < 0.05. R^2_{fvm} indicates the total proportion of the variance in the DV explained by the model.

Variables	Certainty			Differentiation		
	Model 13 (β)	Model 14 (β)	Model 15 (β)	Model 16 (β)	Model 17 (β)	Model 18 (β)
Intercept	**1.18****	**1.16****	**1.20****	**1.65****	**1.70****	**1.75****
Level 1						
Role	0.01	0.02	0.01	0.20	0.16	0.16
Level 2						
Violence		0.04			0.31	
Ideology			-0.03			0.12
AIC	316.59	323.83	323.60	543.26	628.40	628.86
BIC	335.40	339.48	339.25	562.08	644.05	644.51
R^2_{fvm}	0.242	0.208	0.212	0.806	0.237	0.214

Note. N = 172. Role is coded 1 = group account, 2 = prominent member, 3 = leader; Violence is coded 0 = nonviolent, 1 = violent; Ideology is coded 0 = right-leaning, 1 = left-leaning. **p < 0.01; *p < 0.05. R^2_{fvm} indicates the total proportion of the variance in the DV explained by the model.

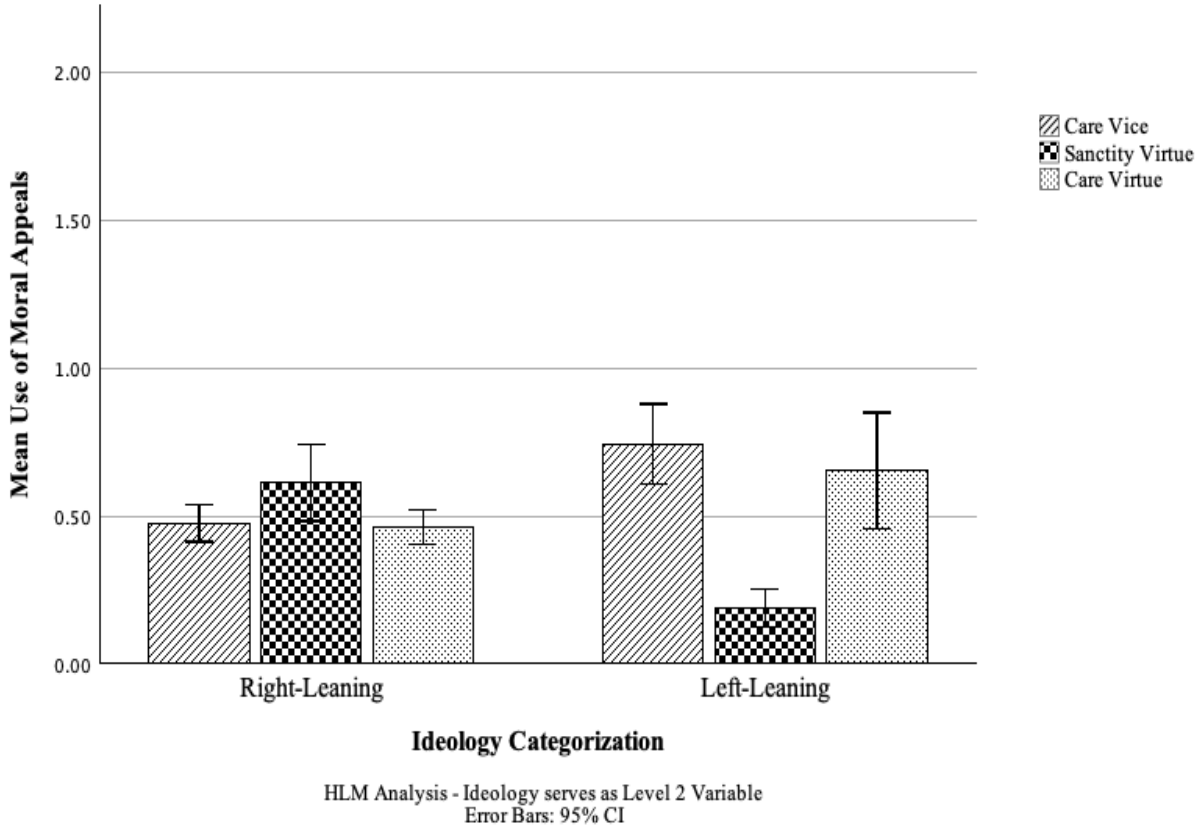

Figure 2. Use of Care and Sanctity Language in the Group Identity Tweets of Left and Right-Leaning Groups

Table 5. HLM results for moral language

Variables	Care Virtue (Care)			Care Vice (Harm)			Fairness Virtue (Fairness)[a]			Fairness Vice (Cheating)[a]		
	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)	Model 5 (β)	Model 6 (β)	Model 7 (β)	Model 8 (β)	Model 9 (β)	Model 10 (β)	Model 11 (β)	Model 12 (β)
Intercept	**0.66****	**0.66****	**0.45****	--	**0.61****	**0.48****	**-1.97****	**-1.84****	**-1.16****	**-1.95****	**-2.10****	**-1.82****
Level 1												
Role	-0.09	-0.08		--	-0.06		0.34	0.32		0.04	0.07	
Level 2												
Violence		0.03			0.16			-0.30			0.31	
Ideology			**0.23***			**0.25***			-0.61			-0.21
AIC	183.66	219.66	211.28	--	160.57	153.54	-780.10	-778.70	-780.40	-1002.30	-1000.90	-1002.50
BIC	202.48	235.31	223.83	--	176.22	166.08	-767.50	-763.00	-767.80	-989.70	-985.20	-990.00
R^2_{fvm}	0.618	0.226	0.248	--	0.620	0.601	0.042	0.053	0.056	0.001	0.015	0.010

Note. N = 172. Role is coded 1 = group account, 2 = prominent member, 3 = leader; Violence is coded 0 = nonviolent, 1 = violent; Ideology is coded 0 = right-leaning, 1 = left-leaning. a=Gamma Distribution imposed on positively skewed dataset. Model 4 failed to converge. **p < 0.01; *p < 0.05. R^2_{fvm} indicates the total proportion of the variance in the DV explained by the model.

Variables	Loyalty Virtue (Loyalty)[a]			Loyalty Vice (Betrayal)[a]			Authority Virtue (Authority)			Authority Vice (Subversion)[a]		
	Model 13 (β)	Model 14 (β)	Model 15 (β)	Model 16 (β)	Model 17 (β)	Model 18 (β)	Model 19 (β)	Model 20 (β)	Model 21 (β)	Model 22 (β)	Model 23 (β)	Model 24 (β)
Intercept	-0.01	-0.17	-0.30	**-3.88****	**-3.80****	**-3.33****	--	**0.67****	**0.65****	**-1.66****	**-1.56****	**-1.64****
Level 1												
Role	-0.13	-0.09		0.21	0.19		--	0.00		-0.05	-0.07	
Level 2												
Violence		0.28			-0.18			-0.14			-0.20	
Ideology			0.16			**-0.65**			-0.05			-0.51
AIC	-21.90	-20.70	-21.70	-2374.50	-2372.70	-2375.50	--	216.10	212.19	-1245.10	-1243.30	-1246.30
BIC	-9.30	-5.00	-9.10	-2361.90	-2356.90	-2362.00	--	231.75	224.74	-1232.50	-1227.50	-1233.70
R^2_{fvm}	0.006	0.020	0.006	0.006	0.007	0.021	--	0.155	0.152	0.000	0.004	0.054

Note. N = 172. Role is coded 1 = group account, 2 = prominent member, 3 = leader; Violence is coded 0 = nonviolent, 1 = violent; Ideology is coded 0 = right-leaning, 1 = left-leaning. a=Gamma Distribution imposed on positively skewed dataset. Models 19 failed to converge. **p < 0.01; *p < 0.05. R^2_{fvm} indicates the total proportion of the variance in the DV explained by the model.

Variables	Sanctity Virtue (Sanctity)[a]			Sanctity Vice (Degradation)[a]		
	Model 25 (β)	Model 26 (β)	Model 27 (β)	Model 28 (β)	Model 29 (β)	Model 30 (β)
Intercept	**-1.36****	**-1.25****	**-0.49****	**-1.36****	**-1.36****	**-1.58****
Level 1						
Role	0.34	0.32		-0.07	-0.07	
Level 2						
Violence		-0.30			-0.00	
Ideology			**-1.18****			0.32
AIC	-486.60	-485.20	-493.00	-863.10	-861.10	-863.70
BIC	-474.00	-469.50	-480.40	-850.50	-845.30	-850.10
R^2_{fvm}	0.030	0.040	0.163	0.002	0.002	0.018

Note. N = 172. Role is coded 1 = group account, 2 = prominent member, 3 = leader; Violence is coded 0 = nonviolent, 1 = violent; Ideology is coded 0 = right-leaning, 1 = left-leaning. a=Gamma Distribution imposed on positively skewed dataset. **p < 0.01; *p < 0.05. R^2_{fvm} indicates the total proportion of the variance in the DV explained by the model.

4. Discussion

Before delving into the discussion, it is important to acknowledge several limitations of this study. First, our sample included only group identity tweets that employed first- and third-person plural pronouns. While these pronouns are a key marker of social identity, groups may use explicit labels to refer to themselves (e.g., "Americans") and members of the out-group (e.g., "radicals"). Prioritizing ideological diversity in our sample made compiling a comprehensive, generalized list of in-group and out-group labels across all groups challenging. We encourage future research to expand upon our work by including group identity tweets that explicitly reference such labels in addition to pronouns.

Second, categorizing groups as violent or nonviolent posed methodological challenges, and we decided to rely on media reports documenting violent actions. Future studies could explore whether our findings hold when employing alternative classification methods, given that some instances of violence may not be covered in the media.. Additionally, our approach treated all recorded violent acts—from verbal intimidation to homicide—as equivalent. While this approach offered a pragmatic starting point, future research could differentiate crime severity to examine whether the intensity of violence correlates with variations in messaging patterns. Finally, regarding scope, this study focused exclusively on Twitter, and future research should investigate whether similar patterns emerge across platforms with different user bases, content norms, and

communication styles. Addressing these limitations will enhance our understanding of the interplay between group identity messaging, ideological tendencies, and social media contexts.

Despite these limitations, we have noteworthy findings to discuss. This study found no significant differences in the use of negative affective language (e.g., anger, fear, disgust) in group identity tweets between violent and nonviolent ideological groups. This contrasts with earlier research indicating that violent groups generally employ more negatively charged emotional language than their nonviolent counterparts in online communications, such as websites and social media posts, which are not limited to group identity messaging (Byrne et al., 2013; Dunbar et al., 2014; Ness et al., 2017). Additionally, our findings differ from those of Scrivens and colleagues (2022), who reported that nonviolent groups tend to express more negative sentiment toward out-groups than violent groups. Instead, we observed that both violent and nonviolent groups exhibit similar levels of negative affective language when discussing themselves or out-groups, with these scores notably lower than their use of positive affective language. Taken all together, our results suggest that ideological groups across the political spectrum, whether violent or nonviolent, tend to convey a predominantly positive sentiment in group identity tweets. This trend is particularly pronounced among nonviolent groups, which used the highest levels of positive affective and trust-related language finding consistent with their broader emphasis on hope and positive emotions in general online communications (Jensen et al., 2024).

The reason for these contrasting findings is likely related to the corpus of social media posts used in this research design. Using group identity tweets as the basis of analysis allowed for a nuanced exploration of ideological group linguistic patterns within tweets that leverage a specific communication tactic: appeals to social identity and the engagement in social categorization. Given that social categorization is a foundational component of ideological group development, it is equally as important to understand these messaging tactics within a more nuanced set of data, as it is to understand how violent and nonviolent groups differ in general communications as past research has discussed (e.g., Byrne et al., 2013; Dunbar et al., 2014; Ness et al., 2017; Scrivens et al., 2022). Since social identity language has significant implications for group development and cohesion, member attitude development, and viewer dissemination intentions (Connelly et al., 2016; Jensen et al., 2023), it is critical to understand better the patterns of language used when social identity is salient and used as an influence mechanism. Therefore, it is theoretically and practically interesting to note that, while violent and nonviolent groups use different levels of negative affect in their general social media communication, they leverage similar levels when attempting to appeal to social identities. As such, positively affective language may be viewed as a more effective influence tactic when social identity and categorization are being discussed, highlighting the benefits of the in-group over the shortcomings of the out-group.

Second, similar to affective language, ideological groups across the political spectrum—whether violent or nonviolent—showed minimal differences in their use of cognitive language (e.g., cause, certainty, differentiation) in group identity tweets. Unlike affective and moral language, cognitive language lacks an established body of research exploring expected differences among ideological groups. This may be because such language cues are universally employed across ideological groups to construct narratives that interpret world events through their ideological lens. These cues often emphasize distinctions between in-groups and out-groups, contrast their narratives with alternative accounts, and strategically balance uncertainty with certainty, occasionally employing tentative language to challenge the status quo. Our study did, however, identify a significant difference in the use of discrepancy language, where violent groups employed it more frequently than nonviolent groups. Discrepancy cues, such as "would," "can," "want," and "could," often signal aspiration, dissatisfaction, or a call to action (Higgins, 1987; Pezzuti, 2023). These cues align with the rhetoric of violent groups, which frequently highlight perceived injustices or deficiencies in the current state of affairs to mobilize support. In group identity tweets, such language may focus on envisioning a transformed future or addressing grievances, reinforcing their calls for radical change. Moreover, discrepancy language can serve as a psychological mechanism to justify violent actions, framing them as necessary to bridge the gap between the present reality and their envisioned ideal. By employing this framing, violent groups may strengthen their narratives, galvanize followers, and create a heightened sense of urgency, distinguishing their rhetorical strategies from nonviolent groups.

Third, our findings reveal that the propensity for violence was not a predictor of moral language use in group identity tweets; instead, political ideology emerged as the primary driver. This suggests that the emphasis on moral issues in identity formation is shaped more by ideological beliefs than by offline violent tendencies. Specifically, we found that left-leaning groups emphasized care language more than right-leaning groups, while the latter used sanctity language more frequently in their group identity tweets. These findings align with previous research on moral language in broader online communications, which indicates that left-leaning

groups prioritize individualizing moral foundations (e.g., care, fairness), whereas right-leaning groups highlight binding foundations (e.g., loyalty, sanctity; Graham et al., 2009). For left-leaning groups, the use of care language likely reflects their emphasis on compassion, inclusivity, and addressing inequalities. By centering their identity on these moral values, they foster solidarity among their followers while advancing a transformative agenda aimed at systemic change and protecting marginalized groups. This focus on care resonates strongly with their ideological base, reinforcing their collective commitment to progressive ideals.

In contrast, the use of sanctity language by right-leaning groups in group identity tweets likely reflects their concerns about purity, tradition, and moral order. This language aligns with their focus on preserving cultural, religious, and societal norms, often evoking themes of protection—whether of cultural heritage, moral values, or national identity. By framing issues as a defense of sacred ideals against perceived threats, sanctity language reinforces in-group cohesion and appeals to a shared sense of moral duty and reverence for tradition. This rhetorical strategy allows right-leaning groups to tap into deeply held emotional and moral convictions, fostering unity and a collective sense of purpose among their followers. These findings offer important theoretical and practical implications. Theoretically, this research advances our understanding of social identity development in online messaging, particularly within ideological groups. The distinctions observed between violent and nonviolent groups and groups with differing political ideologies provide valuable insights into the psychological and social needs these groups leverage in shaping their online identities. These findings help refine existing theories by illustrating how groups strategically employ language to cultivate membership and mobilize support.

Practically, these results offer actionable insights for counter-messaging and deradicalization efforts. By recognizing the distinct patterns in messaging used by violent and nonviolent groups and left-leaning and right-leaning ideologies, practitioners can develop more targeted interventions to disrupt the narratives these groups promote. For example, counter-messaging strategies may be better tailored to address the moral foundations (e.g., care vs. sanctity) that resonate with different groups, ultimately aiming to reduce the appeal of extremist ideologies. Additionally, the patterns observed in group identity language may serve as diagnostic tools for identifying groups with a higher proclivity toward violence. However, further research is needed to confirm the predictive value of these indicators.

Statement of Researchers

Researchers' contribution rate statements

Conceptualization – all authors. **Data curation** – all authors. **Formal analysis** – JS, HS, ABL.
Funding acquisition – MJ, SC. **Investigation**– MM, DP, BS, ABL. **Methodology** – HS, JS, ABL. **Project administration** – MJ, SC, ABL. **Software** – JS, HS. **Supervision** – ABL, SC, MJ. **Writing – original draft** – MM, DP, ABL. **Writing – review & editing** – ABL, JS, CG.

Conflict statement:

The authors declare that they have no conflict of interest

Data Availability Statement:

The data that support the findings of this study are openly available in Open Science Framework at https://osf.io/9re56/files/osfstorage/67917d0b00d1c3f372b5395d

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Presentation(s) or Awards at a meeting:

This research extends posters presented at the APS Annual Convention (2022) and ENVISION (2022).

Ethical Considerations:

All data used for analysis was publicly available, no additional participant data requiring additional consent forms was collected.

The Authors' Biographies

Ares Boira Lopez earned her Ph.D. in Industrial-Organizational Psychology from the University of Oklahoma, with a minor in Quantitative Psychology. For over three years, she served as Research Grant Team Lead on a federally funded project examining ideological rhetoric and influence online, where she led the design of experimental studies, managed qualitative and quantitative data analysis, and translated findings into actionable insights for counter-messaging strategies. This work, funded by National Counterterrorism Innovation, Technology, and Education Center (NCITE), has contributed to multiple government reports, national conference presentations, and peer-reviewed publications. She now works as a Research Specialist at NCITE, where she leads the development and validation of psychological assessments to evaluate behavioral threat recognition and response in counterterrorism and targeted violence prevention programs. Dr. Boira Lopez's broader research interests include extremist organizations, AI-assisted creativity, collective leadership, and affect variability.

Joseph W. Stewart is a Ph.D. candidate in Industrial and Organizational Psychology at the University of Oklahoma. His research interests include leadership, emotions in organizations, ethics, personality, and ideological communication in online settings.

Hairong Song, Ph.D. is a Quantitative Psychology Professor at the University of Oklahoma. She does research in quantitative methods in two areas: (a) intensive longitudinal data analysis and dynamical system analysis, including (single- and multi-level) dynamic factor analysis and time series analysis, and (b) psychometric evaluation of behavioral measures with Frequentist and Bayesian approaches. Her current areas of substantive research focus on substance uses and (mental) health outcomes among children, adolescents, and young adults.

Dr. Marina Mery is driven to leverage her extensive education in I/O psychology and experience in research methodology to assist in the talent assessment process for employees and organizations. After earning her PhD in Industrial/Organizational (I/O) Psychology from the University of Oklahoma, she joined SKS Consulting Group. In her role as a talent assessment consultant, she has been able to apply I/O principles to strengthen personnel decision-making for organizations.

Divya Patel is the Senior Learning and Development Leader for North America Fabric Care at Procter & Gamble, where she leads efforts to build capability that drive business results. She specializes in designing impactful learning experiences that align with strategic priorities and enable employees to grow and perform at their best. Divya also brings deep expertise in leadership development and executive succession planning, with a focus on building strong, future-ready talent pipelines. She holds a Ph.D. in Industrial-Organizational Psychology from the University of Oklahoma, which informs her evidence-based approach to developing people and organizations.

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