

Changing Channels?

A comparison of Fox and MSNBC in 2012, 2016, and 2020

Authors:

Kevin Lanning¹, Geoffrey Wetherell², Evan A. Warfel and Ryan L. Boyd³⁻⁵

¹ Wilkes Honors College, Florida Atlantic University

² Department of Psychology, Florida Atlantic University

³ Department of Psychology, Lancaster University

⁴ Security Lancaster, Lancaster University

⁵ Data Science Institute, Lancaster University

Abstract

We compare the contents of Fox and MSNBC weekday evening telecasts using natural language analysis with the Linguistic Inventory Word Count (LIWC) and sociopolitical dictionaries tapping into moral foundations, values, grievances, and personality. Across time, the two networks differed substantially across many constructs, particularly those from the LIWC. The core of the difference between the networks was captured by a four-component measure which we labeled *Personalizing vs. Formal* speech. Scores on this measure were particularly volatile during 2019 and 2020, a period which included Trump's first impeachment, the beginning of the COVID pandemic, and the 2020 presidential campaign. In comparison with prior presidential election years, only MSNBC showed a drop in positive emotions in 2020, while both networks increased in the use of communal and analytic language. Contrary to our expectations, the language style of the two networks did not demonstrate increasing divergence over time.

Keywords: Fox, MSNBC, LIWC, United States, text analysis, news media

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The social psychology of American politics is manifest in the personalities of political elites (Hammack, 2010; Winter, 2013), the actions of political masses (Jordan et al., 2018; Nickerson & Rogers, 2010), the nature and timing of shifts in presidential regimes (Skowronek, 2011), as well as in our own identities as persons and citizens (Huddy et al., 2015). The social psychology of presidential elections is manifest, too, in the words that connect, inform, influence, and persuade us. In the present study, we examine the social psychology of the 2020 US presidential election through the lens of language. Specifically, we compare the social psychology reflected in two cable news networks using natural language analysis by quantifying key psychosocial and sociopolitical markers found in the transcripts of each network. We scaffold our understanding of the social psychology of the 2020 U.S. presidential election by comparing it with results from the two prior presidential elections in 2012 and 2016.¹

The importance of Fox News and MSNBC

Two of America's major cable news networks — Fox News and MSNBC — anchor opposing ends of the political spectrum and, as a consequence, are the focus of the present study. The audiences of each of the networks is highly partisan: Some 93% of those who identify Fox News as their main news source identify or lean Republican, while 95% of those who primarily rely on MSNBC identify or lean Democratic (Pew Research Center, 2020). The messages broadcast on these networks can be expected to resonate with their respective audiences (Iyengar & Simon, 2000). The distinctiveness of the Fox and MSNBC audiences, the resonance of their messages with their viewership, and the prominence of cable news as a primary information source, have all helped drive our deepening partisan divide (Stecula, 2018).²

Despite this seeming symmetry in the audiences of Fox and MSNBC, Fox News has a greater impact on the American political landscape. This impact is seen among both mass publics and political elites. The greater impact of Fox on the masses occurs both because its viewership is typically larger (Johnson, 2021) and because the news buffet available to those on the ideological left is typically more heterogeneous than that available on the right (Dempsey et al., 2021; Hoewe et al., 2020). Consequently, more people rely on Fox than on MSNBC as a primary news source: Roughly 1 in 6 Americans self-identify as a Republican who relies primarily on Fox, while 1 in 25 is a Democrat who relies primarily on MSNBC (Pew Research Center, 2020). These differences in numbers lead to a greater impact of Fox on American attitudes: For example, viewership of Fox, but not of MSNBC, predicts popular beliefs about climate change and attitudes towards a US–Mexico border wall (Hoewe et al., 2020).

Among political elites, the impact of Fox News can be seen in all three branches of American government. U.S. counties with higher Fox viewership elect judges who impose harsher sentences (Ash & Poyker, 2019). The advent of Fox has increased the number of Republicans in Congress (Arceneaux et al., 2016; Martin & Yurukoglu, 2017). During the Trump regime, the relationship between the network and the Presidency became entwined, even symbiotic (Enrich, 2020; Yglesias, 2018).

The language of media influence

Broadcast media shape the public's political attitudes and behaviors in many ways. While perhaps the most salient of these is through simple persuasion, or by telling people *what to think*, this constitutes only one avenue of media-facilitated influence. Critically, the media also shape public and political consciousness through agenda-setting, that is, by presenting us with a diet of information which steers *what we think about* (Houghton, 2014). Beyond this, the form and

content of news and opinion media additionally guide *how we think*, that is, the extent to which we are informed by rumor, anecdote, dialogue, and scientific evidence. The media have the potential to shape attitudes implicitly as well as explicitly, through discourse built from bricks of family metaphors, moral foundations, values, motives, grievances, and personality. Finally, there are patterns of grammar and language use which may differentially resonate with the Left and Right, constructs which we are increasingly able to assess objectively with tools such as the Linguistic Inquiry and Word Count (LIWC, Pennebaker et al., 2015). In the following paragraphs, we briefly introduce several of these building blocks of media discourse and explore how they may be related to and influence political psychology.

Family metaphors. Lakoff (1995) argued that the political messages of the Left and the Right could be understood in terms of moral metaphors rooted in the structure of the traditional family. Conservative messaging emphasized themes of toughness and strength and could be summarized in terms of a “strong-father” metaphor. Liberal messaging was less coherent and loosely centered on a “nurturant-parent” metaphor.

Several studies have examined Lakoff’s themes in political texts. Moses and Gonzales (2015) focused on the extent to which Lakoff’s parenting themes were characteristic of language used in television ads. Using transcripts of ads from nine presidential campaigns which were coded by human judges rather than algorithmically, these investigators found that ads for Republican and Democratic candidates differed particularly in the nurturant parent category. McAdams et al. (2008) examined two facets of each of Lakoff’s metaphors, and found that two strict father themes (“rules” and “discipline”) were more characteristic of stories produced by self-described conservatives; the themes of “nurturance” and “empathy” were both more characteristic of liberals. Nieman et al (2016) created narrow-bandwidth dictionary measures of

these four themes, then examined their presence in samples of texts from Democratic and Republican speeches and news telecasts. These investigators reported significant effects in the predicted direction for “rules,” (with words such as *abide*, *assign*, and *authority*) and for “nurturance” (*adopt*, *advice*, *aid*). These dictionaries included an average of 41 terms; they reported null results for the shorter discipline and empathy dictionaries (which averaged just 17 words).

Moral foundations. Moral foundations theory (Graham, Haidt & Nosek, 2009) suggests that human morality is based on a number of psychological systems that express themselves across human institutions and societies. Liberalism should be associated with ‘individualizing’ moral foundations of fairness and harm/care, and conservatism with the ‘binding’ foundations of authority, purity, and loyalty. The foundations of fairness and harm/care describe a sensitivity towards and dislike of pain in others, as well as the desire for equality (particularly among liberals) and proportionality (particularly among conservatives; Skurka et al., 2020). These predicted relationships have been largely supported in studies using questionnaire measures (Graham et al., 2011) and, to a lesser extent, in studies of moral language as well. For example, in an analysis of Unitarian and Baptist church sermons, Graham and colleagues (2009) found that Unitarian sermons were more characterized by language associated with fairness (*balance*, *bias*) and harm/care, and Baptist sermons by language of authority (*abide*, *agitate*) and purity. For loyalty, results ran counter to predictions, as Unitarian sermons were more characterized by language associated with this moral foundation. These results, including the finding that Unitarians were more rather than less likely than Baptists to invoke language associated with loyalty/ingroup, were successfully replicated by Frimer using a revised set of moral dictionaries (2020). However, these results did not extend to other religious denominations, and the extension

of these analyses to various political texts led to only mixed results (Frimer, 2020). Two other studies which examined political texts using the original Moral Foundations Dictionary each reported null results (Neiman et al., 2016; Padfield & Buchanan, 2020). The inconsistency in these results suggests that the relationship between morality and language is complex and is perhaps partially moderated by ideology. Liberals, for example, are more likely to use language associated with quantification when they talk about injustice (Dehghani et al., 2014).

Social values. Schwartz has presented a theory of ten human values, each of which is associated with social and/or organismic goals which are manifest across situations. Schwarz's broad values are associated with narrower political attitudes such as law and order, are manifest across countries with varying political histories, and are associated with voting behavior (Caprara et al., 2006; Schwartz, 1994; Schwartz et al., 2010, 2014). Conceptually, the ten values can be represented in what has been termed a 'quasi-circumplex,' that is, a two-dimensional structure which is apparent using non-metric multi-dimensional scaling (MDS), but which is less well-represented using traditional tests of psychometric structure (Perrinjaquet et al., 2007). Two higher-order dimensions underlie this model, namely, Self-enhancement *vs.* Self-transcendence and Openness to Change *vs.* Conservation. These dimensions are related both to the constructs of Agency and Communion and to the Big Five traits of Extraversion and Agreeableness (Gurtman, 2009).

More recently, a separate set of investigators has developed a broader set of text analysis dictionaries for the Schwartz values: the Personal Values Dictionary (PVD; Ponizovskiy et al., 2020). The authors conducted a rigorous evaluation of personal values in natural language, including expert-based aggregation and data-informed refinement of value-relevant terms, paired with the analysis of some 180,000 texts ranging from social media posts to political blogs. As in

previous work, they found that the Schwartz values exhibited modest but coherent relationships with political orientation, with references to the values of power (*agency, conquer, strength*) being more frequent in conservative blogs and references of self-direction (*creativity, principles, reasoning*) being more frequent in liberal blogs.

Motivated social cognition. Jost and his colleagues have argued that individual differences in ideological orientation are deep-seated, based in motives to reduce uncertainty and threat, and give rise to attitudes towards the status quo and existing social hierarchies (Jost, 2017; Jost et al., 2003). Neiman and her colleagues (2016) created four dictionaries which were intended to measure motivated social cognition, including resistance to change, endorsement of inequality, threat, and uncertainty avoidance. In a study of the language of Republican and Democratic politicians, they found that the longest of these dictionaries (threat, with 42 words including *alarm, anarchy, and argue*) was found to be associated with political conservatism; the remaining measures showed results which were null or opposite to the predicted direction.

Grievances. The language of grievance is prominent in media discourse. People across the political spectrum air grievances, including grievances about perceived threats to traditional cultural mores as well as others about sentiments regarding the mistreatment of vulnerable groups. Understanding this language is particularly important given recent upheavals associated with perceptions of grievance. Dictionaries compiled by van der Vegt and colleagues (2021) capture the language of grievance and differentiate between threatening and non-threatening, abusive and non-abusive language, as well as neutral language and the language of extremists. These dictionaries are designed with the intent of capturing grievance-related language across the political spectrum. Global language associated with grievances (e.g., *assault, complain,*

complaint, despair) and specific categories of grievance (e.g., violence, desperation, honor) may each be characteristic of networks such as Fox News and MSNBC.

Linguistic style and structure: Noun use. The deeper structures associated with conservatism include a preference for order, closure, and simplicity, and because of this ideology may be reflected in grammar, particularly in noun use.

On the one hand, Lakoff (1995) argued that essentialism (e.g., *is an athlete* rather than *is athletic*) is characteristic of conservatives, suggesting a potential mechanism for a positive association between conservatism and noun use. Empirically, noun use is characteristic of both the speeches of Republican (over Democratic) American Presidents and the preferences of conservative (over liberal) Polish undergraduates (Cichocka et al., 2016 see also; Crawford, 2018; Karmannaya & de-Wit, 2021). In passing, it can be noted that the label *Democrat* (as opposed to *Democratic*) *Party*, which exemplifies both a noun-preference and the tendency to essentialize, has, since the 1940s, been used as a subtle but effective term of disparagement (Hertzberg, 2006; Siegal & Connolly, 1999).

Nevertheless, there is considerable reason to expect that liberals, rather than conservatives, should use relatively higher rates of nouns in everyday life. Liberals tend to use more “analytic” language in general (Faulkner & Bliuc, 2018), which is identifiable by its high rate of both nouns and noun-related parts of speech. The latter category includes determiners (*the, a, an*) that express the degree of specificity of nouns and prepositions (*over, between, before*) which can express relationships between nouns (see, e.g., Boyd et al., 2020; Jordan et al., 2019). This link between analytic verbal behavior and the use of noun-related particles suggests that nouns will be used at higher rates by liberals relative to conservatives.³

Personality and permeability. Of the personality traits that make up the Big Five, Openness to Experience has the greatest significance for political behavior (McCrae, 1993). Openness may be represented as a type of permeability, which is a parameter of boundaries (e.g., walls and membranes). Boundaries were the core concept in Lewin's topological psychology, delineating both the life space and psychologically salient concepts within it. (Lewin, 1936).

Boundaries and permeability, like Lakoff's concepts about strong fathers and nurturant parents, may be understood as metaphors which engage or galvanize political consciousness. The salience of firmness or impermeability to the Republican base has been reflected in the rhetoric of charismatic leaders including Barry Goldwater in 1964 ("Extremity in the defense of liberty is no vice"), and, more concretely, Donald Trump in 2015, who declared his candidacy for the presidential nomination by announcing that he would build a "great, great wall on our southern border," an idea that remained central in his successful 2016 US presidential campaign (Johnston et al., 2017) and through his subsequent term of office.

Boundaries are associated with personality and ideology in numerous ways. In surveys, Democrats have long valued flexibility and permeability, while Republicans have instead valued firmness and principle. In 2013, 85% of Democrats, but only 49% of Republicans, said that they preferred that their congressperson would "Compromise[s] to get things done" rather than "Stick[s] to their principles, no matter what" (YouGov, 2013). Eight years later, the same question provided nearly identical results: 79% of Democrats, but only 44% of Republicans prefer "compromise" over "principles" (YouGov, 2021). In political texts, the writings of Republicans are more likely to use language associated with the (bounded) biological self, and less likely to use language about the mind, than are Democrats (Robinson et al., 2017). Van Hiel

and his colleagues have claimed that liberals and conservatives differ in their boundaries ranging from art preferences to sleep habits (Van Hiel & Cornelis, 2006; Van Hiel & Mervielde, 2004).

The term ‘permeability’ can be disambiguated into three separate concepts based on the direction of information or impulse: Openness, Control, and Compartmentalization (Lanning, 2011, 2018). Each of these has relevance to political psychology. *Openness*, like the similar construct of absorption, may be represented as a semipermeable membrane which allows information to flow *into* the life space. Openness to experience has been described as important in "nearly every aspect of the individual's life," including affective, sensory, and cognitive systems (McCrae, 1993). Empirically, low scores on questionnaire measures of openness are associated with political conservatism (Osborne & Sibley, 2020; Van Hiel & Mervielde, 2004).

Control may be understood as a semipermeable membrane which operates in the opposite direction, allowing the relatively unrestricted *outward* expression of impulses in behavior (J. H. Block & Block, 1980). The ideological relevance of control is seen in the Blocks’ longitudinal study which found overcontrol in toddlers to be predictive of conservatism in young adults (J. Block & Block, 2006).

Finally, while openness and control describe a relationship between the person and the broader environment, *compartmentalization* may be thought of as a characteristic *within* the person, that is, as a property of cognitive or internal boundaries between different concerns in a person’s life, different social roles, and/or different interpersonal relationships.

Compartmentalization is among the oldest constructs in political psychology, with roots that go back to Jaensch’s Nazi-era claim that synesthetes suffered from ‘disorganized thinking’ and Sanford’s later counter-claim that it was hyper-organization, in the guise of intolerance of

ambiguity, that was indicative of pathology (Adorno et al., 2019; Carney et al., 2008; Jaensch, 1938).

The mass media and partisanship

We live in a time of increasing political polarization (Valdesolo & Graham, 2016). This polarization is multiply determined, driven in part by formal properties of social groups (including social comparison and persuasive argumentation; Isenberg, 1986) or networks (e.g., the Matthew Effect, through which inequalities in social influence may be expected to grow over time; Barabási & Bonabeau, 2003), by correlated economic trends including increasing inequality, by generational change (Stoker & Jennings, 2008), and to some extent by active residential sorting (Martin & Webster, 2020; Motyl, 2014).

Though differences between the political parties are real, the animus between opposing partisans (Iyengar & Westwood, 2015) is greater than our actual differences in policy positions (Westfall et al., 2015). Felt differences among the masses have no doubt been encouraged by the words and actions of elites (Gervais, 2019; Webster & Abramowitz, 2017), but they are likely exacerbated by new media (Bail et al., 2018). The success of social media applications such as Twitter and Facebook depends upon the ability of these platforms to hold our attention with compelling, ego-syntonic content (Wu, 2017). The success of cable news networks similarly depends upon their ability to engage humans who are fallible, who seek affirmation as well as information, and who are particularly sensitive to perceived threats to their own group or tribe (Callaghan & Schnell, 2001; Schlueter & Davidov, 2013).

How, and how much, have cable news networks changed? The competitiveness of the cable news landscape, together with other forces driving polarization, suggests that differences between networks such as Fox News and MSNBC will increase over time. However, it is also

possible that the content of what is broadcast on the networks has changed qualitatively as well as quantitatively.

Since Trump's nomination in 2016, the Republican Party has become more explicitly linked with racism, populism, and incivility, and less with traditional libertarian beliefs and economic conservatism (Goethals, 2018). The changing face of the party can be seen in attitudes towards its standard bearers. As of early 2021, only a small minority of GOP voters (roughly 15%) had a negative opinion of 2016 and 2020 nominee Donald Trump; the preferred candidate of this group was 2012 GOP nominee Mitt Romney. These 'Never Trumpers,' once mainstream, are in some ways an anachronism in the modern Republican Party: They are more moderate, educated, suburban, and wealthy, are less likely to have a firearm in the home, and are more likely to endorse pro-choice policies. (Fabrizio, Lee & Associates, 2021).

The changing nature of the Republican Party has been echoed on Fox as, during his term in office, Trump and the network were linked in a mutually beneficial relationship, providing ratings for the network and safety, reinforcement, and exposure for the then-president. Since the 2020 election, this synergism has continued: Lacking the megaphone of the Presidency and the social media platforms from which he has, since the insurrection of January 6, 2021, been banned, Trump has been increasingly dependent on the network for exposure. Fox, for its part, has carried exclusive interviews with the ex-President, and has hired ex-Trump staffers and family members including Kayleigh McEnany, Larry Kudlow, and Lara Trump as paid hosts and contributors.

These developments in the Republican party, and in its relationship with Fox News, suggest accelerated changes in the content of Fox News transcripts between 2012 and the last two presidential election years. Although there have no doubt also been changes in the

Democratic party, and in media organizations such as MSNBC which are perceived to favor it, they are not as dramatic, as evidenced by the relative ideological and establishmentarian continuity in the party standard-bearers (Obama, Clinton, and Biden) across the last three Presidential elections.

Method

To examine how political discourse has changed over time, we collected all transcripts from MSNBC and Fox News Network telecasts for the period January 1, 2011 through March 21, 2021 that were available from the Nexis Uni[®] database (LexisNexis, 2021). We eliminated duplicates, providing an initial archive of 52,858 transcripts comprising over 283 million words.

In an attempt to make the Fox and MSNBC archives as comparable as possible, we coded broadcast programs as ‘news’ or ‘opinion,’ and examined these against daytime/evening and weekday/weekend dichotomies. This revealed imbalances — for example, our archive contained no transcripts for the weekend *Meet the Press* program (broadcast on MSNBC as well as on its host network of NBC), but it did include its analogue *Fox News Sunday*. Further, much of the daytime programming included titles (e.g., *MSNBC Special*, *Fox News Network Live Event*) with unspecified content. Accordingly, we restricted our sample to only transcripts of weekday late afternoon and evening shows (4 PM to Midnight). Finally, given the focus of the present *ASAP* special issue, we focused principally on the three presidential election years of 2012, 2016, and 2020. In this sample, there were more than twice as many Fox as MSNBC transcripts, but MSNBC transcripts were typically longer. As a result, the total amount of text available for the two networks was similar (see Table 1).

Measures. We used 22 scales from the LIWC (Pennebaker et al., 2015), which were non-overlapping and judged to be related to social or political content. Briefly described, the LIWC is

a widely-used text analytic tool that quantifies psychosocial processes in natural language data. The most recent version of the LIWC (LIWC2015) is comprised of ~90 “dictionaries” or lists of words that reflect various psychological dimensions, such as affect, social focus, and thinking styles. The LIWC application operates by scanning texts for words belonging to each psychological category, quantifying each of these metrics as a relative frequency. For example, the sentence “Natalie celebrated with friends yesterday” would be coded as 20% for positive emotions (“celebrated”), 20% social (“friends”), and 20% past oriented (“yesterday”). The LIWC dictionaries have been extensively validated across thousands of studies (see, e.g., Tausczik & Pennebaker, 2010) and are generally understood to be the “gold standard” of language-derived psychological measures.

Additional measures were derived using BUTTER (Boyd, 2020), a “sister” application to the LIWC. BUTTER is a text analysis toolkit for social scientists that is more open-ended than LIWC, but possesses many of the same capabilities and features. For the current study, we used two features from BUTTER: dictionary-based content coding (i.e., the same method used by the LIWC) and part-of-speech (POS) tagging. In both cases, all measures were calculated and, parallel to those described for the LIWC, are reflected as relative word frequencies (i.e.,

$$\frac{\text{\# of words captured by dictionary}}{\text{\# of words in transcript}} \times 100).$$

For the content-coding feature in BUTTER, we used dictionaries drawn from public domain and previously-published sources, including Neiman et. al’s (2016) measures of moral (family) metaphors and Motivated Social Cognition and Frimer et. al’s (2019) Moral Foundations Dictionary 2.0 (MFD-2). We also used measures of values (Ponizovskiy et al., 2020), agency and communion (Pietraszkiewicz et al., 2019), and grievances (van der Vegt et al., 2021). POS scoring was achieved by first tagging all words in each text for its respective POS

(e.g., nouns, verbs) using the CoreNLP framework (Manning et al., 2014). Each text, then, was quantified as a combination of relative frequencies across various syntactic categories. For example, the sentence “Kayla loves strong coffee” would be quantified as 50% nouns (Kayla, coffee), 25% verbs (loves), and 25% adjectives (strong).

Finally, we constructed new, additional dictionaries with the intent of capturing the high and low poles for the constructs of Openness, Control, and Compartmentalization. In each case, we began with a set of seed terms, then extracted synonyms from thesaurus.com.⁴ These lists were reduced by removing multi-word phrases and then removing duplicate terms within and between the lists. The length of these dictionaries ranged from 43 words (low Control) to 86 words (low Compartmentalization).

Reduction of the set of measures. Descriptive analyses of our training data revealed some redundancies (e.g., the Schwartz value measures were assessed at both a basic level and were summed to provide higher-order levels) and that several measures (including Neiman’s measure of uncertainty avoidance, the new low Openness dictionary, and the Loyalty-Vice dictionary from the MFD-2) had little variation. We reduced the ten measures from the MFD-2 of moral ‘virtues’ and ‘vices’ to five moral foundations (e.g., *Moral Sanctity*), and summed the four Nieman measures of moral metaphor to two measures of *Nurturant Parent* and *Strong Father* Ideology. Similarly, we summed the four Nieman measures of *Motivated Social Cognition* into a single index, and the six measures of Permeability to two, associated with the high and low poles of the construct, which we labeled *Permeable* and *Restricted*, respectively. Details of the data reduction are provided in the supplementary materials and on our OSF page.

We simplified the 22 Grievance dictionaries (van der Vegt et al., 2021) on the basis of principal components analysis (PCA) with a direct oblimin rotation on the training data (Bryant

et al., 1996). We determined the number of components to retain based on parallel analysis, optimal coordinates, the acceleration factor, examination of the scree-plot, and interpretability of the extracted components (Raïche et al., 2013). We extracted four components, the first three of which we labeled *Overt Violent Grievances* (e.g., Hate, Murder), *Covert Social Grievances* (Frustration, Jealousy), *Obsessive Grievances* (Fixation, Planning). The fourth category includes concepts such as God, help, honor, and relationships; to the extent that these characterize ‘grievances’ we determined that these likely reflect a dimension of *Honor and (Dis)Respect*.

We combined the four higher order Schwartz Value Dictionaries (Ponizovskiy et al., 2020) with two measuring Agency and Communion (Pietraszkiewicz et al., 2019), then ran a second PCA with the same criteria used in the analysis of grievances. Here, we extracted two components which we labelled *Communion* and social-focus (e.g., Communion, Conservation, Self-transcendence) and *Agency* and self-focus (e.g., Agency, Openness to Change). This solution maps broadly on previous theory examining human motivation to both expand the self, for example, through mastery and personal control (Abele & Wojciszke, 2007). Details for these component analyses may be found in the supplementary materials and on our OSF repository for the current project.

On the use of machine learning. Our analyses included random forest analysis, a machine learning approach, which we used to assess the extent to which the archives from the three presidential elections and two networks could be distinguished, as well as the features which are most important in driving these effects (Breiman, 2001). Random forests are sets of automatically generated decision trees which are trained to predict or categorize outcomes. Each tree generates a decision rule based on a bootstrapped (randomly sampled with replacement) sample of the data, as well as a random selection of input features (independent variables). The

model is an aggregate built of the set of features which appear most frequently in these individual trees. Some advantages of the technique, including its relative robustness against multicollinearity and sensitivity to non-linear as well as linear effects, are described in IJzerman et al. (2018).

In random forests and other machine learning techniques, data are first split into two or more samples, including a training dataset upon which models are based and an independent test dataset upon which the accuracy or effectiveness of these models can be assessed. We used two separate random forest analyses to find the features associated with election year (2012, 2016, 2020) and network (Fox, MSNBC). In each case, we ran our analyses on the 9357 individual transcripts in the training data using the scikit-learn package in Python (Pedregosa et al., 2011).⁵ We used the default value of 100 for the number of trees or estimators but limited the depth of each tree to no more than 5 splits or levels and required that a minimum of 8 trees appear in each split of every node. Each of these latter decisions was undertaken to avoid overfitting, particularly because our interest was less in maximizing predictive accuracy via feature engineering than with extracting the most robust or important features in the data. Finally, because of class imbalances in the number of Fox and MSNBC transcripts, we report Cohen's Kappa as a measure of classification effectiveness on the test data.

Results

We describe our results in three sections: We begin with random forest analyses of the networks in the three election years. We then examine the primary dimension which differentiated the two networks across the entire decade of transcripts. Finally, we return to the three presidential election years and examine the effect size for year and network for each of the individual language measures.

Random Forest Analyses

To extract the features most associated with changes (across both networks) over time, we trained one random forest to distinguish between the 2012, 2016, and 2020 archives while being agnostic to the transcript source. This model obtained an accuracy score of .65 (kappa = .42). Here, six features accounted for just over half of the total relative feature importance in the model; these included *Moral Sanctity*, *Permeability*, *First-person plural Pronouns*, *Affiliation*, *Third-person singular Pronouns*, and *Anxiety*.

To assess cable network effects, we compared the Fox and MSNBC archives, combining all three years of data. This model obtained an accuracy score of .80 (kappa = .52). Just four of the 39 dictionaries accounted for over half of the total relative feature importance. These features were *Second-person Pronouns (You)*, *Analytic*, *Impersonal Pronouns*, and *Nouns*.

Comparing Fox and MSNBC on a single dimension of difference

We created a single measure which parsimoniously differentiated Fox and MSNBC by combining the four measures from the random forest analysis of cable network effects. This *Personalizing vs. Formal Index (PFI)* was computed by standardizing each of these measures, then summing the first (Second-Person Pronouns) with reverse-coded scores for the remaining measures (Analytic, Impersonal Pronouns, and Nouns), then restandardizing the composite.

We examined this score across the last ten years of Fox and MSNBC transcripts. For each weekday between January 2011 and March 2021, we computed a single score for each network from all available evening transcripts for that date. As can be seen in Figure 1, 21-day smoothed curves that depict PFI scores for each network across time are non-overlapping. Prior to 2015, the curves appear consistently and widely separated by approximately 1.5 standard deviations. During the 2016 and, in particular, the 2020 presidential campaigns, the trend lines are marked

by seismic shifts, indicating volatility in the use of Personalizing vs. Formal language for each network.

When examined on a week-by-week basis, Trump's first impeachment stands out as a force driving both divergence and convergence in the two networks. Two of the four weeks showing the greatest difference between the two networks occurred at the beginning of Trump's first impeachment in early December 2019.⁶ As the House hearings began, Fox News was particularly characterized by Personalizing language, and MSNBC by more Formal language. Conversely, the only two weeks during the decade on which Fox transcripts were more Formal and less Personalizing than those of MSNBC occurred during the Senate hearings on Trump's impeachment (January 2020) and during his subsequent acquittal (February).

The remaining four weeks showing the greatest convergence in Personalizing language were all associated with the 2020 Presidential campaign. These included the beginning of Trump's campaign and debates among the Democratic candidates (both June 2019), the second debate between Trump and Biden (October 2020), and the beginning of Trump's second 'campaign' to contest the election after Biden had been declared the winner (November). During each of these periods, Fox transcripts were marked by a more Formal, and less Personalizing tone, approaching the language characteristic of MSNBC. Summary scores for these weekly trends are included in the Supplementary materials and on the project OSF page.

Examination of individual measures

To consider the three election years more closely, we consider results for the 23 LIWC and grammar dictionaries followed by the 16 sociopolitical measures. In each case, we examine the standardized means for each measure by network and by year. In these analyses, we used the

date (rather than the individual program or transcript) as the unit of analysis, as this provided a common baseline for comparing the two networks.

LIWC dictionaries and Nouns. Table 2 includes standardized mean scores for each network for each LIWC dictionary for each year. The table is ordered by these implied difference scores in the last of the three election years under study: Measures in the top rows are dictionaries which were more represented in the Fox than in the MSNBC transcripts in 2020, while for those in the bottom rows, the converse is true. In the table, we highlight only those effects that are conventionally characterized as “large” ($|d| > .8$) and “medium” ($.8 > |d| > .5$; Cohen, 1988). It is important to note that these conventional labels are somewhat arbitrary and, in the context of most psychological research, conservative (Funder & Ozer, 2019).

Across the three election years, differences on the LIWC between the networks were substantial. On a typical weekday evening in 2012, a Fox viewer would hear far more second person pronouns (*you*; $z = .94$) than would a member of MSNBC’s audience ($-.47$), for a difference of over 1.4 standard deviations. In 2016, this difference remained over 1.3 standard deviations. MSNBC transcripts were correspondingly greater in Analytical thinking (by 1.54 sd. in 2012 and 1.14 in 2016) and Nouns (1.48 and .98). In addition to these three measures in the Personalizing-Formal Index or PFI, Fox was also associated with a greater focus on the Present (*today, now*), First-person singular pronouns (*I, me*), and Cognitive Processes (*know, cause*). Each of these effects was more characteristic of the transcripts from 2012 and 2016 than of those from 2020. In addition, words related to Achievement (*hero*) were more frequent on MSNBC than on Fox, particularly in 2012.

In 2020, the distinguishing characteristics of language largely shifted. Fox was characterized by an increase in Third-person Plural Pronouns (*their*). MSNBC was characterized

by a drop in words associated with Positive Emotion (*nice*) and reward (*crave*), and an increase in Impersonal pronouns (*it*). Both networks used more Analytic language, and both showed an increase in First-Person Plural Pronouns — *we* — in the pandemic year.

Contrary to our expectations, differences between the two networks were, across the LIWC measures, typically smaller in 2020 than in prior election years.

Sociopolitical measures. Results for the sociopolitical dictionaries, including the measures of moral foundations, moral (family) metaphors, and component scores from the analyses of grievances and values, are shown in Table 3. In contrast to the results for the LIWC, no differences between the networks were ‘large’ ($|d| > .8$), though medium-size effects were found for some measures. Across the three election years, Fox was characterized more by Agency than MSNBC, though scores for each network dropped in 2020. In the last two election years, Fox was relatively characterized by language associated with grievances of both Disrespect and Obsessiveness. Over time, both networks showed similar (and typically large) effects for the moral foundations of Authority, Sanctity, and Care: Language associated with each of these dropped from 2012 to 2016, then increased from 2016 to 2020. Language associated with Communion and Permeability also increased in 2020.

As with the LIWC measures, overall differences between the networks were smaller in 2020 than in the previous election years. Additional tables which explicitly show year and source effects may be found on the project OSF page.

Graphical depictions of illustrative measures. Figures 2 and 3 each contain four plots emblematic of the patterns found in the LIWC and other measures. These plots demonstrate some of the key similarities and differences in language use between the networks across the three election years, including in 2020. Figure 2 depicts the convergence between networks for

Analytic language, Nouns, and Second-person pronouns across the three years, as well as a growing difference favoring MSNBC in Impersonal pronouns, especially in 2020. Figure 3 depicts the drop in Positive emotion language on MSNBC in 2020, in contrast to relative stability in Negative emotion language. Figure 3 also depicts the decline in Agency and the increase in Communion in the language of both networks in 2020. Plots for all 39 LIWC and dictionary measures are included in the Supplementary materials and on the project OSF page.

Discussion

During the last ten years, the United States has continued to fight in multiple wars abroad and has seen increasing economic inequality at home. There has been an increase in, or at least an increase in awareness of, hate crimes and racial injustice. Americans have suffered a spate of mass shootings in sacred spaces including public schools and places of worship. Climate-related natural disasters have increased in number and in severity (NOAA, 2021). Finally, America has, despite its technological and economic advantages, suffered more confirmed cases and deaths from the COVID-19 pandemic than any other country in the world (CNN, 2021).

Even against this backdrop, the year of the 2020 presidential election, together with the campaign and impeachment which preceded it and the lawsuits and insurrection which followed, stands out in the language of Fox News and MSNBC. The language of these two networks was never more distinct, and never more volatile, than during coverage of political events associated with the last presidential election. Yet the differences in language of the two networks was primarily in measures of linguistic style, including noun and pronoun use. Sociopolitical dictionaries largely tailored to assess left-right differences in language use, including moral metaphors and foundations, grievances, values, and personality, showed relatively modest effects (see also Kennedy et al., 2021).

The Personalizing-Formal Index. Our analyses of simple dictionary measures of natural language revealed that Fox and MSNBC news transcripts were largely distinct, and that the difference between them could be roughly captured by a simple four-variable composite which we labeled the *Personalizing-Formal Index* or PFI. Fox News transcripts are characterized by a greater density of Second-person pronouns, while MSNBC is characterized by Impersonal pronouns, Nouns, and Analytic content.

The “personalizing” pole of this dimension, that is, second-person pronouns (e.g., *you*, *you’re*, *your*, and *you’ll*) reflects language that is conveyed in a direct manner “to” another person or people, making it a particularly compelling marker of a direct social connection (Packard & Berger, 2020). Consequently, personalizing language requires that the speaker and audience have a shared understanding (Boyd et al., 2020b; Chung & Pennebaker, 2007; Stewart et al., 2019). The greater use of personalizing language on Fox News than on MSNBC is consistent with the finding that Fox serves a relatively tightly-knit and homogeneous audience (Dempsey et al., 2021; Hoewe et al., 2020).

The “formal” pole is instead marked by higher use of nouns, analytic language, and impersonal pronouns (*it*, *it’ll*, *it’s*). The use of nouns and analytic language tends to reflect formal language that is used to describe ideas and their inter-relationships, and is typically associated with reason and logic as opposed to intuition and anecdote (Boyd et al., 2020a; Boyd & Pennebaker, 2015; Jordan & Pennebaker, 2017). Similarly, the use of impersonal pronouns is generally associated with language that is generic, socially distant, and psychosocially mature (Lanning et al., 2018; Marshall et al., 2015; Weiner & Labov, 1983; cf., Pennebaker et al., 2014).

There is an apparent tension between our finding of greater noun use and formal language on (progressive) MSNBC than on (conservative) Fox and the reported association between

conservatism and noun use reported by some authors (Cichocka et al., 2016; Crawford, 2018). One possibility is that the frequency of nouns in a text may reflect several things, including the complexity of content (e.g., the “number-of-things-named”) as well as aspects of style such as a greater frequency of noun adjuncts or the use of nouns to stand in for adjectives (as in *Democrat* over *Democratic* party). This hypothesis notwithstanding, we agree with Crawford (2018) that the mechanism relating ideology to noun use remains unclear, and that future work should strive to shed light on this question.

Positive emotion. In 2020, a striking difference emerged between the networks in language associated with Positive Emotion, which dropped by approximately one standard deviation for MSNBC, but much less for Fox (see Figure 3). One possible source for this differential effect was the extent and nature of coverage of the COVID pandemic on the two networks: Fox News devoted fewer minutes to the pandemic and, when they did address it, was more likely to consider its effects on business and the economy, while MSNBC was more likely to stress public health concerns and the scale of the virus (Muddiman et al., 2020). Fully 79% of Fox News viewers, but only 35% of those of MSNBC, believed that coverage of the pandemic was exaggerated in the Spring of 2020 (Jurkowitz & Mitchell, 2020). The news of the pandemic was bleak, and it was more fully treated on MSNBC than on Fox; the greater drop in Positive Emotion on that network is consistent with this difference in coverage.

Convergence. Given trends and forces towards polarization and the competitive cable news environment, we anticipated that the contents of Fox and MSNBC transcripts would diverge across the series of the three presidential elections we have examined here. We found no evidence for this in our analyses. Rather, despite the finding for Positive Emotion, the overall

pattern of change in the networks from 2016 to 2020 indicated a trend towards rather than away from convergence.

Convergence between the networks occurred, in part, due to changes in the amount of Analytic content. In 2012, the two networks were separated by over 1.5 standard deviations. From 2012 to 2016, both networks dropped, perhaps reflecting the greater focus on scandal, impropriety, and anecdote which strongly characterized the 2016 presidential campaign. From 2016 to 2020, both networks increased, particularly Fox News. One possibility is that in 2020, as the reality of the pandemic reared its ugly head, the denial of science and logic that is the antithesis of analytical thinking simply became less tenable. Though the networks remain separated by .7 standard deviations in 2020, this is less than half of the gap that separated them eight years previously.

In addition to the effect for Analytic thinking, partial convergence was forged, in part, by a pattern of common change in the two networks which included large drops in Agency (self-focus) and increases in Communion (social focus), and in language associated with three moral foundations. The increased social focus seen on the cable networks in 2020 is reminiscent of the increase in social focus seen in analyses of diaries following September 11, 2001 (Cohn et al., 2004). Moreover, the pattern of convergence between the networks in the face of the pandemic is consistent with the literary motif in which animosities and differences between factions are rendered frivolous in the face of a larger struggle (Moore et al., 2019), as well as the classic finding from the Robbers' Cave study that a superordinate challenge can distract from, if not reduce, tension between ideological tribes (Sherif, 1958).

The calculus of appealing to partisans versus the center. In an analysis of political actors, Downs (1957) argued that appeals to extreme voters in primary campaigns were an

effective strategy for securing party nominations, but could hurt candidates in general elections. Consequently, political rhetoric during general elections should turn towards the median voter. Downs's model is now seen as an oversimplification (Ebner, 2021), but it does serve as a reminder that political actors face different payoffs for appeals to the extremes and to the center.

That the same may be true of cable news networks is suggested, in part, by the evolving slogans or taglines of the two networks under study. Until recently, Fox has dominated the cable news landscape on the political right. This dominance has allowed it to use ostensibly centrist, credibility-focused slogans (*Fair and Balanced* and *We Report, You Decide*) without the risk of alienating their political base. During this same time period, MSNBC was in a battle with CNN for left-of-center viewers, and its slogans, including *The Power of Change* and *Lean Forward*, suggested an appeal to progressives. Beginning in 2018, the slogans of Fox (*Real News. Real Honest Opinion*) and MSNBC (*This is who we are*) appeared interchangeable, suggesting a playing field in which each network was striving for credibility to a broad audience. This balance was disrupted following the November 2020 election, when Fox, facing criticism from Trump and an increasing threat from networks on the right such as Newsmax and One America News, embraced a new slogan which parsimoniously integrated metaphors of fortitude, uprightness, and conservatism (Lakoff, 1995): Fox's new slogan is "*Standing Up For What's Right.*"

Both Fox and MSNBC are commercial networks which strive for advertising revenues as well as journalistic integrity. Their content, like their slogans, reflects a changing competitive landscape in which credibility, fostered by understatement and nuance, matters. Subtle messaging including "dog-whistles," aimed at resonating with their intended audiences, are likely to carry positive rewards for each network. An extensive empirical track record suggests that the LIWC is well-suited for assessing many of these subtle speech patterns (Boyd &

Schwartz, 2021) , and that it can outperform narrowly tailored dictionaries such as the MFD-2 (Kennedy et al., 2021).

Future directions. Future directions for research in the area can be described at three levels of analysis. First, with respect to the language of Fox and MSNBC, richer methods of analysis are available. We looked only at broad differences in the transcripts of daily programming and ignored the effects of individual programs and speakers. Further, our invocation of natural language analysis relied largely on the simple, brute-force technique of word-counting rather than more computationally intensive approaches such as word embeddings, which represent words in a high-dimensional space and, in their recent incarnations, are sensitive to the sequence of words in a document as well. Techniques such as these are likely to provide a richer understanding of the nature and impact of Fox News and MSNBC (Kennedy et al., 2021).

Second, with respect to the relationship between ideology and language use, we have already addressed the need for continued study of the nature and mechanism of relationships between noun use and liberalism/conservatism.

Finally, we note that the verbal channel is only a fraction of political communication. Though analyzing transcripts can reveal key differences, our methods are powerless to detect effects of linguistic elements such as affective prosody and speech cadences, as well as differences between telecasts in what is seen as well as in what is heard (Bucy & Grabe, 2007; Coleman & Wu, 2006). The first 1960 Nixon vs. Kennedy debate remains a canonical illustration of the power of images. Today, these extra-verbal aspects of television news have become far richer, comprising visual elements like backgrounds, chyrons, graphics, as well as sound effects including music. In other words, the language of Fox and MSNBC is only part of the way in which these networks differ.

Summary. We found that transcripts of Fox and MSNBC weekday evening telecasts differed substantially on a dimension which we labeled the Personalizing-Formal Index (PFI). This index is comprised of differences in measures of pronoun use (Second person vs. Impersonal), Analytic content, and Noun use. Across the last decade, Fox transcripts were substantially more ‘Personalizing’ than those from MSNBC. Scores on this index were volatile during the presidential campaigns of 2016 and, in particular, 2020. This volatility suggests that the measure may be a sensitive indicator of political communication during Presidential elections and in times of social turmoil.

In addition to these differences in Personalizing-Formal language, we also found that the networks also consistently differed on a number of additional measures, including Reward and Obsessive Grievances. Substantial effects were found for election year as well. In comparison with 2016, the pandemic year of 2020 was marked by increases of more than one standard deviation for both networks on indices including First-person plural pronouns (*we*), Affiliation, Communion, and Moral Sanctity. Taken together, these and other results provide a lens into the magnitude and nature of differences not just between the two networks, but also of a volatile and divided time in American social and political life.

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Footnotes

¹ This is an exploratory study which was not preregistered. Data were obtained from the proprietary Nexis Uni[®] database, which can be accessed at some 2,000 libraries (LexisNexis, 2021). Search parameters for data extraction, code, and supplementary materials, are available at our OSF page (<https://osf.io/qync7>).

² A third prominent cable network, CNN, also has an audience which is primarily viewed by Democrats, but is less partisan than MSNBC (Pew Research Center, 2020). Accordingly, had we focused on CNN rather than MSNBC we would likely have obtained a similar, though attenuated, set of results.

³ Analytic language can be an indicator of complexity (Erisen et al., 2018), but the measurement of complex speech is itself complex. On the LIWC, *cognitive* complexity has been measured in at least three different ways (Lanning et al., 2018). Research with the related construct of *integrative* complexity shows a more nuanced pattern, with evidence of a link between liberalism and complexity present in studies of political elites, though not in masses, when this construct is assessed by hand-scoring (Houck & Conway, 2019).

⁴ For Openness, the seed terms were *receptive, susceptible, and accessible*, and, at the negative pole, *impervious, unsusceptible, and inaccessible*. For Control, terms were *uncontrolled* and *expressive* versus *controlled, inexpressive, expressionless, and unexpressive*. For Compartmentalization these were *organized, tidy, well-defined, and clear* versus *disorganized, untidy, and vague*.

⁵ For those using R, see Rosenbusch et al. (2021) for a detailed introduction to the use of random forests and related techniques.

Table 1

Structure of Fox News and MSNBC archives from 2012, 2016, and 2020

Source and year	Training sample		Test sample		Full dataset	
	Words X 1000	Transcripts	Words X 1000	Transcripts	Words X 1000	Transcripts
Fox News						
2012	7731	3237	2514	1034	10245	4271
2016	8884	1407	3002	483	11887	1890
2020	11317	1683	3685	547	15001	2230
Total (Fox)	27932	6327	9201	2064	37133	8391
MSNBC						
2012	7225	936	2271	292	9496	1228
2016	5745	709	2094	262	7839	971
2020	11099	1385	3566	452	14665	1837
Total (MSNBC)	24069	3030	7931	1006	32000	4036

Note. Data represent the set of available transcripts for Fox News Network and MSNBC for weekday telecasts between 4PM and Midnight for the specified years. Full dataset excludes 1% of the sample (128 transcripts, 715K words) which were studied for anomalies, then discarded prior to analysis.

Table 2

Mean LIWC and grammar measures by network and election year

Direction in 2020	Measure	2012		2016		2020	
		Fox	MSNBC	Fox	MSNBC	Fox	MSNBC
Fox > MSNBC	Third-person plural (e.g., <i>they</i>)	0.40	0.14	-0.14	-0.55	0.74	-0.64
	Positive Emotion	0.29	0.14	0.56	-0.03	0.12	-1.09
	Reward	0.33	0.12	0.36	-0.26	0.18	-0.74
	Second-person pronouns (<i>you</i>)	0.94	-0.47	0.73	-0.58	-0.06	-0.63
	Present focus	0.70	-0.39	0.62	-0.41	-0.04	-0.53
	First-person singular pronouns (<i>I</i>)	0.60	-0.41	0.88	0.06	-0.33	-0.81
	Future focus	0.08	-0.34	0.22	-0.07	0.27	-0.18
	Social	0.06	-0.02	0.62	0.22	-0.24	-0.63
	Negative Emotion	0.36	0.04	0.27	-0.27	-0.07	-0.37
	Cognitive Processes	0.41	-0.45	0.64	-0.04	-0.16	-0.42
	Authentic	0.31	-0.45	-0.14	-0.18	0.25	0.19
	Affiliation	-0.23	-0.34	-0.32	-0.57	0.72	0.68
	Past focus	-0.25	0.13	0.03	0.48	-0.15	-0.18
	First-person plural pronouns (<i>we</i>)	-0.07	-0.60	-0.30	-0.67	0.79	0.77
MSNBC > Fox	Anxiety	-0.13	-0.56	0.39	-0.24	0.23	0.27
	Clout	-0.52	-0.11	-0.04	-0.29	0.44	0.48
	Power	-0.07	0.58	-0.57	-0.06	0.04	0.09
	Risk	0.03	-0.34	0.04	-0.64	0.31	0.54
	Third-person singular pronouns (<i>she</i>)	-0.28	0.25	0.51	0.98	-0.86	-0.50
	Nouns	-0.52	0.96	-0.65	0.33	-0.22	0.18
	Achievement	-0.23	0.61	-0.28	0.01	-0.28	0.20
	Analytic	-0.66	0.88	-0.97	0.17	-0.03	0.67
	Impersonal pronouns	-0.17	-0.22	-0.21	0.24	-0.22	0.6
	Average absolute difference	0.60		0.57		0.42	

Note. The unit of measurement is the available text for a given date and network. Entries are z-scores for the combined test + training data. Rows are ordered by decreasing difference between Fox and MSNBC in 2020. Boldface and italicized values indicate **large** ($|d| > .8$) and *medium* (.5) effects for the difference between networks (Cohen, 1988). Nouns computed using BUTTER (Boyd, 2020). Other measures from the LIWC2015 (Pennebaker et al., 2015).

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Table 3

Sociopolitical measures by network and election year

Direction in 2020	Measure	2012		2016		2020	
		Fox	MSNBC	Fox	MSNBC	Fox	MSNBC
Fox > MSNBC	Disrespect	0.21	0.34	-0.03	-0.53	0.30	-0.35
	Obsessive Grievances	0.33	0.00	0.29	-0.48	0.18	-0.36
	Agency	0.50	-0.08	0.64	0.04	-0.34	-0.78
	Restriction	0.20	0.06	0.04	-0.26	0.13	-0.20
	Overt/Violent Grievances	0.12	0.04	0.26	-0.07	-0.07	-0.28
	Strong Father	-0.18	-0.11	-0.20	-0.39	0.51	0.32
	Moral Authority	-0.03	0.21	-0.73	-0.5	0.60	0.41
	Communion	-0.32	0.11	-0.39	-0.65	0.66	0.53
	Moral Fairness	-0.26	0.32	-0.08	-0.32	0.20	0.12
	Covert/Social Grievances	0.31	0.02	0.24	-0.24	-0.13	-0.21
	Moral Care	-0.13	0.12	-0.20	-0.66	0.44	0.38
	MSNBC > Fox	Motivated Social Cognition	-0.24	-0.57	0.25	-0.50	0.50
Moral Sanctity		0.03	-0.04	-0.53	-0.68	0.58	0.58
Nurturant Parent		0.23	0.33	-0.28	-0.56	0.07	0.16
Moral Loyalty		-0.36	0.17	-0.18	0.01	0.06	0.31
Permeability		-0.67	-0.24	-0.24	-0.24	0.44	0.92

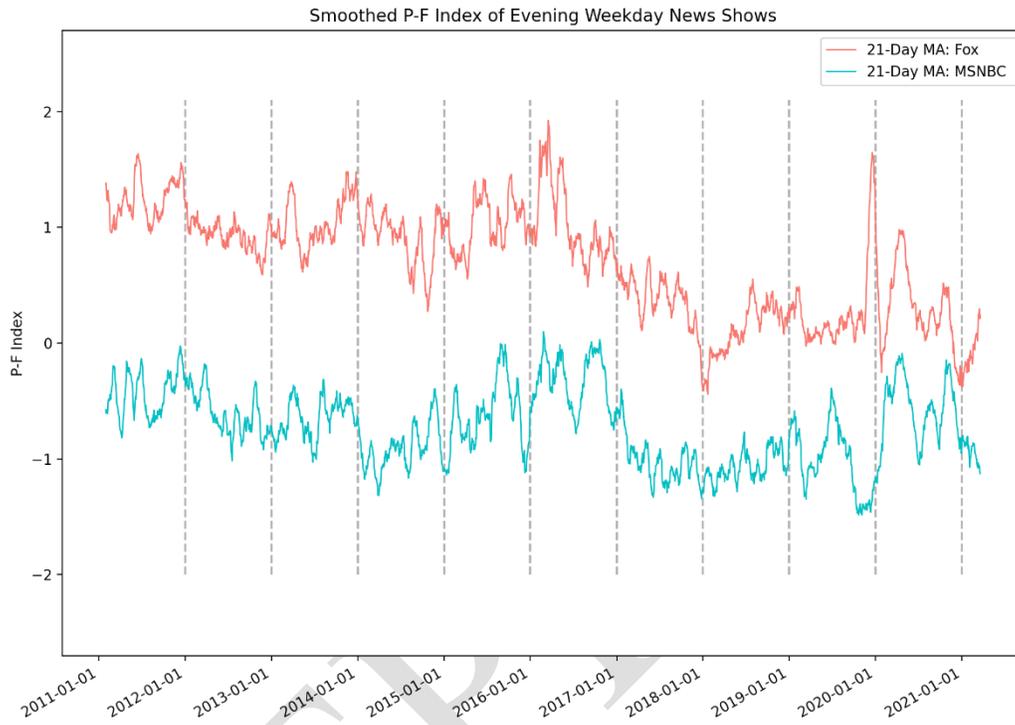
Average absolute difference	0.29	0.36	0.23
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Note. The unit of measurement is the available text for a given date and network. Entries are z-scores for the combined test + training data. Rows are ordered by decreasing difference between Fox and MSNBC in 2020. Italicized values indicate *medium* ($|d| > .5$) effects for the difference between networks (Cohen, 1988).

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Figure 1

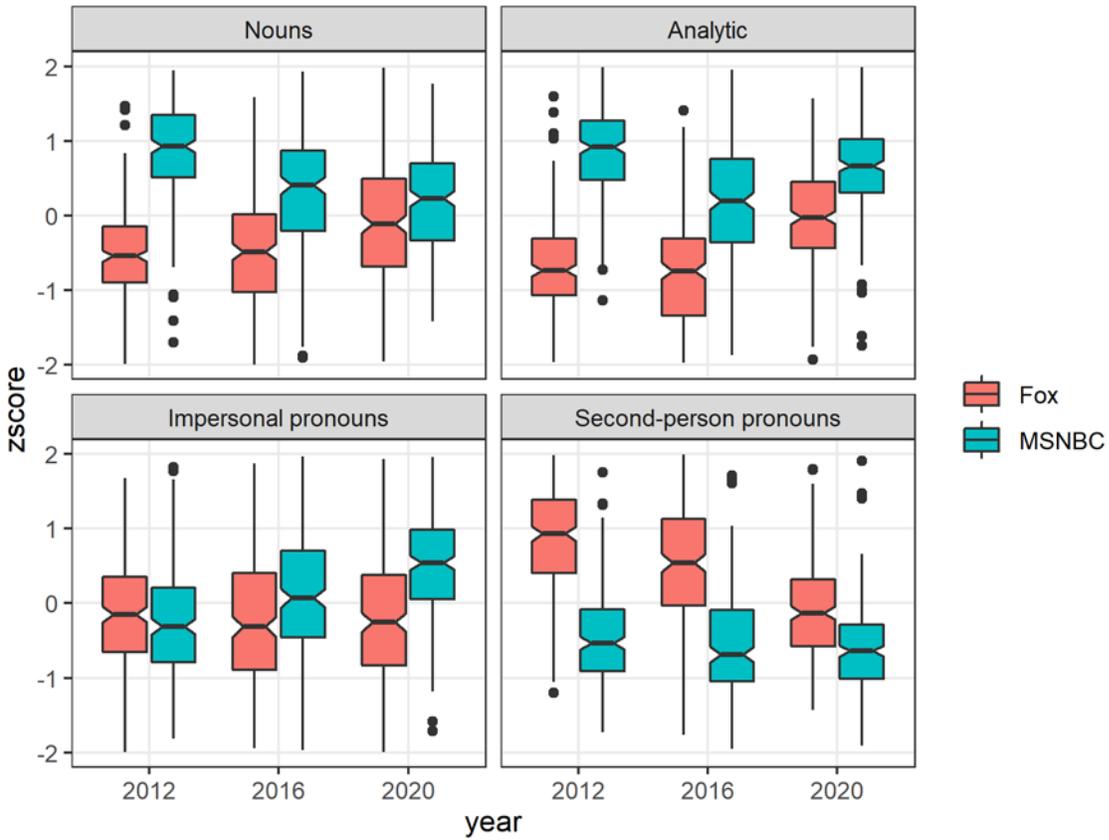
Personalizing vs. Formal Language on Fox and MSNBC over time



PRELIMINARY

Figure 2

Selected LIWC measures for Fox and MSNBC during three presidential election years



PRR

Figure 3

Agency, Communion, and Emotional tone on Fox and MSNBC during three presidential election years

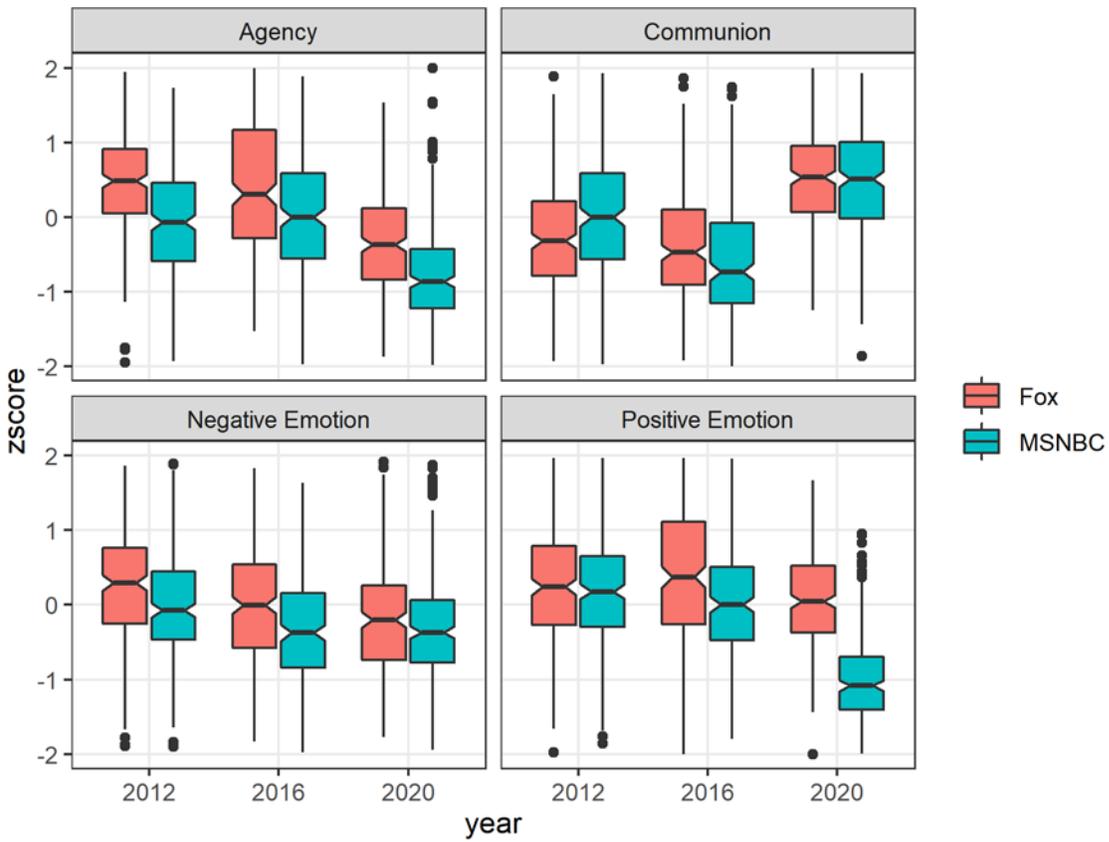


Figure captions

Figure 1. Scores on Personalizing vs. Formal speech for MSNBC and Fox News weekday evening telecasts between January 2011 and March 2021. Values along the y-axis reflect a standardized composite of the four key differentiating features identified by the random forest analysis: Second-person pronouns less Analytic, Nouns, and Impersonal pronouns. Values are computed for each network on a per-transcript basis and are smoothed by a 21-day moving average.

Figure 2. Notched box plots indicating scores on four language features for Fox News and MSNBC in three presidential election years. Notch width indicates 95% confidence interval for median (Wickham, 2016).

Figure 3. Notched box plots indicating scores on four language features for Fox News and MSNBC in three presidential election years. Notch width indicates 95% confidence interval for median (Wickham, 2016).

Author bios

Kevin Lanning is a Professor of Psychology and Data Science at the Wilkes Honors College of Florida Atlantic University. Lanning earned his bachelor's and doctoral degrees at UC Berkeley, specializing in personality and measurement. His current research interests include applying computational methods including text and network analysis to the study of psychology and social problems.

Geoffrey Wetherell is an Assistant Professor of Psychology in the Department of Psychology at Florida Atlantic University. He received his BA from San Diego State University and his Ph.D. from DePaul University in Chicago, Illinois. Dr. Wetherell's research focuses on stereotypes and prejudice in the context of United States Politics. Specifically, he examines the way stereotypes suggesting groups violate core values relate to support for public policies and discrimination across the political divide. He is also interested in our moral beliefs and convictions and how such beliefs provide a sense of meaning in life, potentially exacerbating morally relevant conflict.

Evan A. Warfel is a consulting data scientist whose academic research interests revolve around personality and language use. He received his BA in cognitive science from U.C. Berkeley, and is intensely curious about people.

Ryan L. Boyd (Ph.D., The University of Texas at Austin, 2017) is an Assistant Professor of Behavioral Analytics at Lancaster University in the United Kingdom, holding joint appointments in Security Lancaster and the Data Science Institute. His research generally aims to better understand how our motives are revealed in language — that is, how our everyday words provide clues to how we think, feel, and behave. Dr. Boyd's research spans topics ranging from personality to society, mental health, human sexuality, and storytelling. He has authored dozens

of free, open-source text analysis applications for social scientists, and he is a co-creator of LIWC2015. Dr. Boyd is on the editorial boards at *PLOS ONE* and *Frontiers in Artificial Intelligence: Language and Computation*, and is a member of the advisory board for *Psychology of Language and Communication*.

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