Changes in Social Media Affect, Disclosure, and Sociality
for a Sample of Transgender Americans in 2016's Political Climate

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Abstract

In the wake of 2016's divisive political climate in the US, media reports indicated that vulnerable people, such as the transgender population, may be experiencing lower than normal rates of emotional wellbeing. To test these claims, we analyzed social media linguistic markers of affect, disclosure, and sociality in late 2016 as compared to the same month a year prior in a sample of US Tumblr blogs documenting people's gender transitions. We find that negative affect, and words related to anger in particular, increased for trans people in 2016. At the same time, social words used to describe family decreased, indicating that trans people may have interacted less with family and friends in late 2016. Self-disclosure decreased for trans women in 2016, potentially indicating increased political language vs. personal content, or self-censorship in response to a hostile political environment. Results highlight ways large-scale external political events may impact how people communicate and disclose on social media. Additionally, our results indicate that social media data could be used to identify those most in need of mental wellbeing resources in response to a hostile political climate.

Introduction

In recent years, transgender[1] Americans have celebrated both increased visibility (David 2017) and gains in rights protections (U.S. Equal Employment Opportunity Commission). Yet, at the same time, trans Americans continue to face substantial discrimination and harassment, and as a result are almost eight times more likely to suffer from psychological distress and almost nine times more likely to attempt suicide than the general population (James et al. 2016). Several key factors had potential to increase these numbers even more in 2016: the election of a vice president with a strong record of opposition to LGBT rights (Tourjee 2016); the sharp increase in hate crimes (Southern Poverty Law Center 2017; Teng 2016); reduced rights in using public restrooms in several states (National Conference of State Legislatures); and the continued troubling levels of harassment both online and off, particularly for marginalized races

and genders (Landsbaum 2016; Newmark 2016). 2016 involved substantial increased attention to trans people, often in hostile ways.

To test how these factors were associated with trans participation and content on social media, we applied computational linguistic methods to a sample of 199 Tumblr "transition blogs," a genre of blog through which trans people document their gender transitions. We compared word use in a one-month period in late 2016 to the same month in 2015. We found significant differences in linguistic characteristics between the two time periods. Trans people's language showed increases in negative affect and angry words. At the same time, social words related to family decreased, implying that people may be interacting less with family and in late 2016, or at least reflecting on and documenting those interactions less. While trans men's levels of self-disclosure increased, for trans women we found a significant decrease in self-disclosure. This leaves open questions about how people communicated their emotions while potentially self-censoring content, replacing personal content with political content, or vice versa.

We show how large external political factors may have significantly impacted a group of marginalized Americans, as portrayed via their personal lives and wellbeing on social media. Social media content can be used to infer people's mental wellbeing (De Choudhury et al. 2013). Thus, we examine how external events and the increased hostile attention the trans population received in 2016 may have impacted this group's mental wellbeing.

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[1] Transgender is a term that refers to "people who move away from the gender they were assigned at birth, people who cross over (trans-) the boundaries constructed by their culture to define and contain that gender" (Stryker 2009). Importantly, a person's relationship to their gender is what matters here, not necessarily physical characteristics or changes. We use "trans" for the remainder of this paper to refer to the broad transgender population.

[2] Non-binary refers to people who identify as one or more of the following: neither male nor female; having several genders; having fluid gender; with a term such as agender, genderqueer, or demigender.

Background and Related Work

We first provide background on transition blogs, then discuss research on trans identity and politics on social media.

Transition Blogs

Transition blogs are a genre of Tumblr blog in which people document their gender transition. Commonly, these blogs include diary-like entries discussing physical and mental changes, medical procedures such as hormone replacement therapy and gender reassignment surgeries, and discussion of the coming out process and resulting acceptance, support, rejection, harassment, and/or discrimination. Many transition blogs include photos and videos documenting changes over time, though in this work we only analyze text content. Transition blogs also often include personal day-to-day anecdotes not related to gender transition or trans identity. Though blogs resemble diaries in some ways, blogs are different because they are inherently social (Nardi, Schiano, and Gumbrecht 2004); the bloggers in our dataset exist within a network of other bloggers, many of whom follow and interact with each other.

Trans Identity and Social Media Sites

On social media sites like Facebook that forbid pseudonymity and multiple accounts, gender transition is often difficult (Haimson, Brubaker, et al. 2015). Presenting oneself online using a post-transition gender, name, and appearance often requires mass trans identity disclosure (Haimson, Brubaker, et al. 2015). However, such platforms are challenging to those who need to engage in experimentation and exploration to find their new gender identity (Haimson, Bowser, et al. 2015). Even after transitioning, digital footprints representing a past gender, name, and appearance may remain on one's profile (Haimson et al. 2016).

Thus, many trans people turn to Tumblr, a site that allows pseudonyms and multiple accounts, and where one's network is not necessarily linked with one's pre-transition network, to experiment with and express their newly-formed trans identities. Previous work has examined Tumblr as a unique platform for people in marginalized or subcultural populations to "be themselves," build community and group identification, and find resources (Dame 2016; Oakley 2016; Renninger 2015). Renninger (2015) explored the affordances that make Tumblr a welcoming place for sexual minorities, and found that the ways people used pseudonymous and multiple accounts made self-expression possible in ways often not possible on identified sites like Facebook. Fink and Miller (2014) argued that Tumblr is a space where those belonging to trans and queer subcultures can represent their identities and cultures on their own terms, rather than relying on the mainstream media to represent them. Additionally, the site de-incentivizes harassment by making comments (called "replies" on Tumblr) less visible than on other social media sites, making the site a relatively safe space for marginalized populations (Renninger 2015). These and other features lead to an openness in discussing stigmatized issues (Premack 2016; Seko and Lewis 2016), which likely influences the prevalence of transition blogs on Tumblr.

Tumblr is not the only platform trans people use to document their transitions; many use YouTube (Dame 2013; Raun 2015), and people also increasingly use Instagram for this purpose. Tumblr is unique because many transition blogs contain substantial text content, unlike transitions as documented on YouTube and Instagram which include primarily visual content.

Politics and Social Media

Political sentiment on social media often closely corresponds to the political climate more broadly, both in the context of elections (Tumasjan et al. 2010) and more specific political issues like reproductive rights (Morgan et al. 2016). After the Iran elections in 2009, Elson et al. (2012) found that pronoun words and swear words on Twitter predicted when large-scale protests would erupt. Similarly, Al-Ani et al. (2012) found that in blogs during the Egyptian revolution, linguistic content related to revolution corresponded with revolution events, while at the same time personal content decreased. Public mood and emotion modeled via Twitter also changed around the 2008 US presidential election (Bollen, Mao, and Pepe 2011). This work and others indicate ways the broader political climate can impact a population's aggregate emotion, as we further illuminate here in the case of a particular marginalized group.

Methods

We collected and analyzed data from 199 Tumblr transition blogs to understand how linguistic markers of emotion, disclosure, and sociality changed over time. This study was approved by our university's Institutional Review Board. Two bloggers from our sample reviewed the paper and provided feedback, which we incorporated into the paper.

Data Collection

Using Tumblr's API (Tumblr 2016) and the PyTumblr API client (PyTumblr 2016), we collected text data from 241 transition blogs starting with each blog's first post (some beginning as early as 2009 and some as late as 2016) and ending on December 14, 2016. We selected our blog sample by first searching on Tumblr using the tags "transition blog," "transition," "mtf transition," and "ftm transition," and then searching using relevant tags that emerged within this initial sample, such as "girlslikeus," "hrt blog" (hormone replacement therapy), "hrt transition," "my transition," "nonbinary transition," "personal," "tpoc" (trans person of color), and "transition timeline." We selected blogs that met the following criteria: having posts with text content more than 10 words long (to enable meaningful text analysis) and focusing on the person's gender transition or on personal content,

rather than being a blog by a trans person about another topic (e.g., fashion, politics). We excluded blogs by people who stated they were younger than 18. Using the first author's Tumblr account, we then "followed" each blog currently in the sample. We examined all blogs listed in this account's list of "recommended blogs" to follow. The recommendation algorithm gave mostly accurate and relevant recommendations, and we added all recommended blogs that met our criteria to the sample. We continued this process for approximately one month before settling on a final sample of blogs. Different blogs were active and inactive during different time periods throughout 2009-2016.

Because of the sensitive, often deidentified, and public nature of the content, we used an opt-out approach to data collection. We messaged each blogger using Tumblr's messaging system, briefly described the study, and asked them to respond and specify if they wished to opt out of data collection. We attempted to message a total of 257 bloggers. 119 (46%) bloggers responded: 104 (40%) of the total initial sample explicitly gave permission to collect their data, 16 (6%) opted out, and three (1%) asked for more information but did not opt in or out. We answered all questions that bloggers asked about the study and data collection. We collected data from the 241 people who did not explicitly opt out of data collection. For this paper's sample we removed 31 blogs that explicitly stated they were from non-US countries (because this paper is focused on the US political climate), and 11 blogs that did not include sufficient text content. This resulted in 199 blogs and 64,787 total posts.

Tumblr users can post content in nine ways: text, photo, quote, link, chat, audio, video, answering a question asked of that blogger by another user ("asks"), and as a "reblog" of another user's post. We collected text content associated with these post types if it was more than ten words long: text content from text, chat, and quote posts, answers from asks, photo and video captions, text accompanying links and audio clips, and text annotating a reblog. We did not collect photos, images, or visual content of any kind.

Data Description
Our full dataset included 64,787 posts, with average word count of 75.52 (median = 34, SD = 133.65). On average, each blogger posted 328 total text posts that met our data collection criteria (median = 86, SD = 696.60), had been blogging for almost two years (mean = 644.79 days, median = 521 days, SD = 499.87 days), and posted two or three times per week (mean = 0.40 posts per day, median = 0.21 posts per day, SD = 0.61 posts per day). The data analyzed to compare posts in November 2015 with those in November 2016 included 3,778 posts from 153 bloggers, and the data visualized in Figure 1 included all 199 bloggers.

Although we did not collect demographic data from bloggers, we found much of this information in their blog de-

scriptions. Most bloggers (95%) prominently stated or implied their gender and many (42%) their age. When placing each blogger into the most prominent gender category that they displayed on their blog (with the caveat that some identified as more than one gender, e.g. transwoman *and* non-binary) bloggers in the dataset were 47% female-to-male/FTM/trans men, 46% male-to-female/MTF/trans women, and 7% non-binary[2]. Like the Tumblr platform more broadly (Smith 2013), our sample skewed young, with 63% of bloggers in the 18-24 age range, 30% 25-34, 7% 35-44, and <1% 45 or over. Because most bloggers (93%) did not specify race or ethnicity information on their blogs, we do not report those demographics here. One limitation of this work is our inability to analyze relationships between race/ethnicity and affect over time.

The November 2015 data included 1,781 posts from 109 different blogs, while the November 2016 data included 1,987 posts from 125 different blogs. This is not an increase in posting over time, but rather is likely due to the fact that our blog sample was compiled in late 2016 and thus includes blogs that began after November 2015. 81 blogs were active during both November 2015 and November 2016. November 2015 posts were 51% from trans women, 43% from trans men, and 6% from non-binary people. November 2016 posts were 51% from trans women, 42% from trans men, and 7% from non-binary people.

Data Analysis
We analyzed data over time to understand how 2016's political climate may have influenced trans Tumblr bloggers' affect. We began by calculating the prevalence of particular emotions in each post using the LIWC (Linguistic Inquiry Word Count) 2015 lexicon, which was built in part using blogs and social media data (Pennebaker et al. 2015). LIWC enables researchers to use computational analysis to understand people's feelings and affect via text (Pennebaker et al. 1993). For each post, LIWC measured the proportion of words in that category out of all the words that appeared in that post. These methods allowed us to extract meaning from a large sample of blogs over a substantial period of time, a task that would not be feasible using qualitative methods. Table 1 shows example posts in our dataset from each of the LIWC categories of interest.

Given the wide ranging media reports of the emotional impact of 2016's political climate on trans Americans (e.g., Patterson 2016; Trans Lifeline 2016), we expected that we may be able to detect some of these effects from trans people's social media content. Although we did not test other groups, similar analysis could be conducted on blogs written by people more likely to be positively impacted by 2016's political events. We examined nine linguistic features related to emotional affect, disclosure, and sociality over time.

Category	Example words	Excerpts from example posts with high prevalence of category
Negative emotions	hurt, ugly, nasty	"Ugh I feel fucking repulsive today. Fuck this male appearance shit. Blaaah."
		"This is so goddamn ugly what the hell is wrong with society."
Anxiety	worried, fearful	"I'm a little worried trying not to freak out hoping she texts me soon."
		"When I think about dying, I panic. When I think about living, I panic."
Anger	hate, kill, annoyed	"Can someone please fucking castrate me. Fuck this shit."
		"It's fucking 2016, almost 2017. Can a bitch use whichever fucking restroom she really needs to go. Fuck you bigots, I hate you."
Sadness	crying, grief, sad	"I'm uncontrollably crying about lost childhoods and missed opportunities."
		"I apologize, so sorry to my friends I hurt when I was hurting."
First person singular	I, me, mine	"I got a new haircut this week, so I know I'll be looking nicer than I did last time, though I suppose I looked alright last time."
		"I'm disconnecting to the extent that my inevitable suicide is almost funny."
Positive emotions	love, nice, sweet	"Love is Love. Kiss someone you love every day! Love is Amazing!"
		"I do feel very happy, and really confident, it's great :D."
Disclosure	summary variable created by LIWC – dictionary not available	"Feeling trapped and exasperated with nothing and everything tonight. I know PMS is amplifying it, but even so, tonight it feels like my transition is disrupting my entire life."
		"I need physical touch (sexual or not) rn like Lindsay Lohan needs cocaine. It's been way too long since someone has touched their skin to mine."
Friend	buddy, neighbor	"Going on a double date with my adorable gf on my arm!!"
		"I'm afraid I won't be my best friend's best friend."
Family	daughter, dad, aunt	"Went on a hike with mom and the dog today."
		"My parents loved their son so much, they destroyed their daughter."

Table 1. LIWC dictionaries used in analysis. All quotes paraphrased to eliminate traceability.

In late 2016, the month after the presidential election, as compared to the same month in 2015, we analyzed prevalence of words related to: negative emotions, anxiety, anger, sadness, first person singular (a proxy for depression (Pennebaker, Mehl, and Niederhoffer 2003)), positive emotions, disclosure, and friends and family (measures of sociality) (see Table 1).

We conducted Wilcoxon tests to identify affect differences between time periods (see Table 2). Because the data is not normally distributed, we conducted nonparametric Wilcoxon tests rather than t-tests which should only be used for normally-distributed data. Specifically, for each linguistic feature, we tested whether prevalence in posts from November 9 – December 9 2016 (which we will refer to as "November 2016 data") was significantly different from affect in posts from November 9 – December 9 2015 (which we will refer to as "November 2015 data"). Conducting multiple Wilcoxon tests increases the possibility of Type 1 errors. Though some results were no longer significant after Bonferroni p-value adjustment (marked in bold but not italics in Table 2), we also conducted Tukey Honest Significant Difference tests on each of these variables and still found significant differences between the two time periods.

We considered several different time periods to compare with November 2016. We chose a comparative time period a year prior that was relatively devoid of politics but that included the same yearly events (e.g., Thanksgiving) as the 2016 time period. Figure 1 shows the variables of interest over time from 2013 – 2016, to give a larger picture of how affect, disclosure, and sociality changed over time.

Complexities of Analyzing Longitudinal Transition Data

Analyzing data over time is often tricky, but analyzing longitudinal data for people going through a major life transition introduces additional complexities. As people transition genders, their mental health is likely to improve (Budge, Adelson, and Howard 2013; Kozee, Tylka, and Bauerband 2012). Yet at the same time, beginning to present as trans and disclosing one's trans identity opens people up to rejection, discrimination, and harassment, which can have negative effects on mental health (James et al. 2016; Nuttbrock et al. 2012). With these complex factors at play in people's personal lives during transition, it becomes difficult to identify the effects of large external events on people's mental wellbeing. Thus, a within-subjects setup would not be appropriate for testing impacts of external factors. Specifically, a personal trajectory of improved mental wellbeing would influence any impacts of a specific event, either exacerbating that improvement or masking it. Thus, in this work, we use a large sample of trans people who are at different stages of their transitions in different time periods. In this sample, both November 2015 and November 2016 included people just starting their transitions, people in mid-transition, and people reaching the final stages of their transition (though we note that each person's transition is unique and involves different goals and trajectories, and may not proceed linearly (Horak 2014)). However, a limitation of our aggregate computational approach lies in our inability to specifically quantify how far along in their transition each person was in each time period.

In the interest of broadening discussion of the complexities of analyzing longitudinal transitional data, we briefly present results of a within-subjects approach. When analyzing posts from only those people who posted content in both

November 2015 and November 2016 ($N = 81$), we found that anxiety increased ($p = 0.01$), but there were no other significant differences in the linguistic variables of interest. This may signal that people's improved mental wellbeing due to gender transition progress could have masked some potential negative effects resulting from 2016's political climate.

Results

We find significant changes in affect in an aggregate sample of Tumblr transition blogs in November 2016 when compared to the same time period in 2015. Trans women's affect changed in different ways than trans men's. Specifically, in November 2016, trans women disclosed less, used more words conveying anger, and used fewer words related to sadness. Trans men disclosed more, used more negative and anxiety words, and used fewer words related to family. There were not enough posts from non-binary people to provide meaningful analysis of changes between the time periods, but non-binary people's posts are included in the full sample results reported in Table 2. These results highlight the important effects uncontrollable outside events may have, even on the content posted on a medium focused primarily on writing about personal life events, and how resulting mental wellbeing changes can be detected via social media. In this section, we present results describing how affect changed over time for the people in our dataset.

Figure 1 shows the variables of interest from 2013 – 2016, and is presented to visualize the findings we discuss here in a larger temporal context. For readability, these plots are smoothed curves fitted by Loess to scatterplots of daily averages, each with approximately one-month moving averages. Thus, the smoothed Loess curves may not accurately visually reflect the results presented in Table 2, as the months analyzed are visualized in the context of the data surrounding those months. While our statistical analysis involves only data from November 2015 and November 2016, we use Figure 1 to discuss trends over time in our larger dataset, visualized from 2013-2016.

Gender Differences
In our early stages of analysis, we found that trans people's affect over time was substantially different for the different genders in our dataset (trans women, trans men, and non-binary people), each of whom face different challenges and experiences (Budge, Adelson, and Howard 2013). In particular, trans men are more often perceived as men than trans women are perceived as women (James et al. 2016), and as a result, trans women (and women more broadly) often face more discrimination, harassment, and violence (Grant et al. 2011; Budge, Adelson, and Howard 2013), which influences mental wellbeing (Kessler, Mickelson, and Williams 1999). This may be one reason that we find different changes in

trans women's mental wellbeing over time than for trans men. Similarly, non-binary people are rarely perceived in the way that they desire (James et al. 2016), given that the world, from bathrooms to boxes on forms, is usually set up as a two-gender system. While the transgender umbrella certainly includes more than the three gender categories we analyze in this work, we separate the data into these three groups to make analysis tractable.

Negative Emotions
For trans people in our sample, the expression of negative emotions on Tumblr was significantly higher in November 2016 as compared to November 2015 (see Table 2). This change was most drastic for trans men. For trans women, negative emotions increased in 2016, but were not significantly different between November 2015 and November 2016. Negative affect in LIWC is a category that includes anxiety, anger, and sadness. Thus, the next three categories are sub-categories of this one, allowing us to more precisely understand what facet(s) of negative affect influenced the broader category's change over time.

Anxiety
Anxiety increased significantly over time for trans men in our sample. Given the precarious state of trans rights in the US in 2016, one might expect greater anxiety among trans women as well, though our analysis did not find significant differences for trans women. LIWC is often better at identifying more general emotions (e.g., positive or negative) than specific emotions like anxiety, anger, and sadness (Bantum and Owen 2009), so it may be that LIWC measures did not effectively pick up on anxiety indicators for some in this dataset.

Anger
Our Wilcoxon tests show that anger within posts increased significantly in late 2016 compared to late 2015, particularly for women (see Table 2). Over the larger 2013-2016 period use of anger words increased for both trans men and women, particularly in 2016 for trans women and in the latter half of 2016 for trans men (see Figure 1). Our results indicate that trans women and trans men may react to political events differently, with anxiety increasing for trans men while anger increases for trans women. To the degree possible, these hypotheses should be tested with additional data as both time and the political climate change.

Sadness
The relative sadness content in posts remained steady for trans men over time (see Figure 1 and Table 2). Surprisingly, sadness decreased in 2016 for trans women. The lack of an increase in sadness in our sample in 2016 may be because sadness is an emotion likely to be related to personal struggles and events, rather than external political events. It may also be that other emotions, such as anger, are more dominant in response to such events, overwhelming sadness expressions.

		Negative emotions	Anxiety	Anger	Sadness	1st person singular	Positive emotions	Disclosure	Friends	Family
		Mean (Standard deviation)								
Full sample	Nov. 2015	**2.27 (3.53)**	0.33 (1.15)	**0.76 (2.07)**	0.47 (1.37)	7.50 (5.80)	5.16 (5.42)	59.41 (35.70)	0.52 (1.51)	*0.55 (1.73)*
	Nov. 2016	**2.57 (3.72)**	0.39 (1.20)	**0.96 (2.38)**	0.43 (1.37)	7.53 (5.69)	5.09 (5.71)	59.64 (35.76)	0.47 (1.55)	*0.33 (1.34)*
	Difference	**	†	*	n.s.	n.s.	n.s.	n.s.	n.s.	***
Trans women	Nov. 2015	2.19 (3.48)	0.31 (1.11)	**0.70 (1.87)**	**0.52 (1.44)**	**7.81 (5.76)**	5.83 (5.65)	**61.20 (35.18)**	0.48 (1.52)	0.30 (1.22)
	Nov. 2016	2.48 (3.74)	0.32 (1.09)	**1.00 (2.49)**	**0.39 (1.23)**	**7.23 (5.55)**	5.60 (6.07)	**57.86 (35.86)**	0.49 (1.61)	0.29 (1.29)
	Difference	n.s.	n.s.	*	*	*	†	*	n.s.	n.s.
Trans men	Nov. 2015	*2.34 (3.57)*	*0.35 (1.19)*	0.81 (2.24)	0.42 (1.34)	**7.23 (5.84)**	4.61 (5.17)	**57.66 (36.15)**	0.55 (1.52)	*0.77 (2.06)*
	Nov. 2016	*2.75 (3.69)*	*0.52 (1.37)*	0.92 (2.20)	0.50 (1.61)	**8.06 (5.88)**	4.09 (4.83)	**62.31 (35.42)**	0.44 (1.43)	*0.41 (1.37)*
	Difference	***	***	n.s.	n.s.	**	†	*	n.s.	***
		† p < 0.10; * p < 0.05; ** p < 0.01; *** p < 0.001								

Table 2. Results of Wilcoxon tests showing changes in affect, disclosure, and sociality over time. Statistics reported are proportion of words in posts that fall into the column's LIWC category, averaged over all posts in that row's time period. Disclosure statistics are from LIWC's "Authentic" measure, which is not a word proportion; LIWC's calculation method for this variable is proprietary. Significant results are in bold. Results in italics were still significant at p = 0.05 after Bonferroni p-value adjustment. For those bolded results not italicized, we still found statistically significant differences between the two time periods in Tukey Honest Significant Difference tests.

First Person Singular

LIWC's first person singular category has often been used as a proxy for depression (De Choudhury et al. 2013; Pennebaker, Mehl, and Niederhoffer 2003). In particular, people who are depressed tend to use words like "I" and "me" more frequently than those who are not depressed (Rude, Gortner, and Pennebaker 2004). In our analysis we found that first person singular increased for trans men, indicating potential increases in negative emotions. However, we found that first person singular words *decreased* in 2016 for trans women (see Table 2). Given our data, we cannot know if these changes correlate to changes in depression itself, or if this measure is a poor indicator of depression on Tumblr in particular. Tumblr transition blog data also may not conform to the same linguistic conventions present in other types of writing (Bourlai and Herring 2014) in which first person singular pronouns correlate with depression. Additional work is required to understand the relationship between first personal singular and depression in Tumblr bloggers. Changes in use of first person singular words could also be related to the decrease in self-disclosure we saw in 2016 (described below).

Positive Emotions

In contrast to media reports (e.g., Patterson 2016) and our expectations, positive emotions did not decrease significantly in posts by trans people in November 2016 as compared to November 2015. There are several possible explanations for this change. Using positive language may be a coping mechanism (Andalibi, Ozturk, and Forte 2017) for some to communicate to their networks that they will be resilient in in the face of the hostile political climate, and to seek support. Many trans people are highly resilient to difficulties they face (Stryker 2009), and this effect is even stronger when people have social connections with other

trans people (Testa, Jiminez, and Rankin 2014), as the people in this sample do on Tumblr. Additionally, people may use positive words when providing social support to others in their networks, a type of discourse that may have increased in response to 2016's troubling events. It may also be that these people felt, and thus expressed, more positive emotions due to personal life events and changes.

Disclosure

LIWC 2015 includes a category called "Authentic" words, described as such: "higher numbers are associated with a more honest, personal, and disclosing text; lower numbers suggest a more guarded, distanced form of discourse" (Pennebaker et al. 2015). Because "authentic" is an imprecise, highly contextual, and socially constructed term (Haimson and Hoffmann 2016), we instead refer to this category as words related to self-disclosure. Disclosure words significantly decreased for trans women in November 2016 when compared with November 2015 data (see Table 2). At the same time, use of disclosure words increased significantly when only analyzing data from trans men in 2016. This indicates that some people in our sample became more guarded and shared less personal information on their Tumblr blogs, while others became less guarded and shared more. There are several possible explanations for decreases in disclosure language. It may indicate a tendency to self-censor one's content in response to a US political climate perceived as hostile. It may also be that in late 2016, people posted more political rather than personal content, in line with the inverse relationship between personal and political content found by Al-Ani et al. (2012).

Friends

Words related to friends did not change significantly for trans people in our sample in 2016. Friends words in our dataset are often used to talk about time spent with friends and relationship partners in the physical world. While we
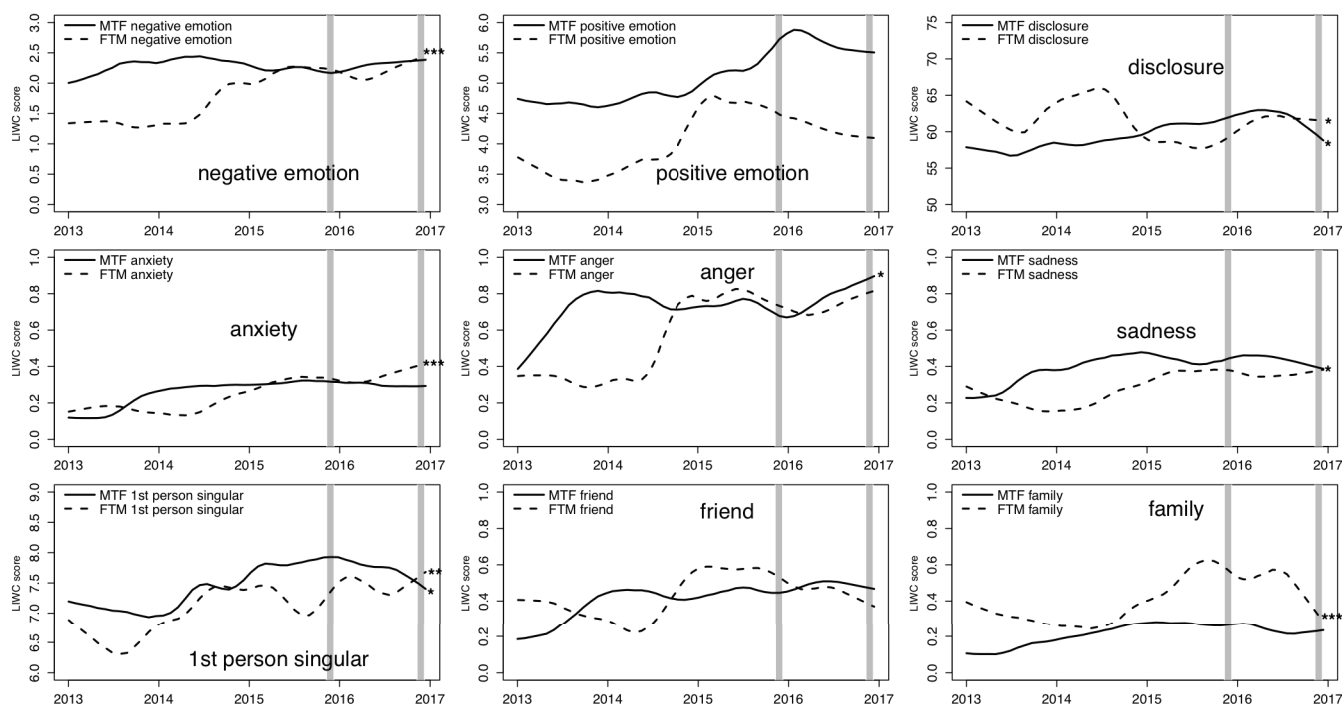
Figure 1. LIWC measures showing proportion of words signifying affect, disclosure, and sociality in Tumblr transition blogs over time, 2013 – 2016. Plots show smoothed curves fitted by Loess to scatterplots using R function loess.smooth, degree = 1, span = 2, with approximately a one-month moving average. Gray bars show comparison time periods. Please note different y-axis scales. MTF = male-to-female trans women, FTM = female-to-male trans men. There were not enough posts from non-binary people in the dataset to provide meaningful visualizations over time.

expected that friends words would increase as people reached out to each other to commiserate and to seek and provide support, this was not the case.

Family

People in our sample posted about family significantly less in November 2016 as compared to November 2015. In our dataset, family words are often used to talk about time spent with family or coming out to family members, but also to journal about difficulties with family. The decrease in family words may signal that people spent less time with and communicated less with family in late 2016 as compared to late 2015, perhaps because of political differences and to avoid hostile situations. After 2016's highly divisive election, many people avoided spending time with family, particularly around traditional family get-togethers like Thanksgiving (Tavernise and Seelye 2016).

Results Summary

We have detailed significant differences in linguistic markers of emotional affect, disclosure, and sociality in Tumblr transition blogs when comparing November 2016 with November 2015. In late 2016, trans women in our sample used more words conveying anger. At the same time, this population disclosed far less than a year prior, leaving open questions around the varying roles of self-censoring, political vs. personal posts, and emotion. Trans men used more words

signaling negative emotion and anxiety and had higher levels of disclosure, yet used fewer words related to family. Overall, people in our sample increased use of words related to negative emotions and anger, and decreases in family words.

Taken together, these results show that, for trans Americans, despite any ups and downs in their personal lives, the year 2016 was associated with changes in affect *en masse*. Facets of this population used more negative and angry words and disclosed less personal information. At the same time, in 2016's political climate, their use of social words referring to friends and family, and perhaps their sociality more generally, decreased.

Limitations

Computational linguistic methods have been found to be robust in identifying sentiment and emotions (Bantum and Owen 2009; Tausczik and Pennebaker 2010), but these methods are not without limitations. For instance, computational linguistic analysis ignores important language facets such as irony, sarcasm, and idioms (Tausczik and Pennebaker 2010), and often do not account for slang and emoticons, which are common on social media (Hutto and Gilbert 2014). Additionally, these methods may over-emphasize emotions (Bantum and Owen 2009).

Although we consider the 2016 US political climate as an impetus for the changes we see in affect, disclosure, and sociality, other factors may have impacted people as well. For instance, 2016 included widespread data hacks and celebrity deaths, which could have influenced the people in our sample. Other potential confounds include stage in transition, race/ethnicity, and age. Thus, we present our results as correlational without causal claims.

Discussion

2016 was a difficult year for many Americans, culminating on November 8 in the election of an administration perceived by many marginalized groups as particularly threatening, based both on past actions and campaign promises (Teng 2016; Tourjee 2016). Though we cannot make causal claims, the election itself may have contributed to some of the changes we saw in affect, disclosure, and sociality for trans people. In response to 2016's overall political climate, many people took to social media to vent and seek or provide social support, while others posted less and some even deleted their social media accounts due to conflicts with people in their online social networks (Lindner 2016; Selyukh 2016). Some reports indicate that the US political climate in 2016 impacted people's mental wellbeing (Majumder 2016; Sheehy 2016), a claim that we have empirically analyzed.

In this work, we have shown how people's manner of expressing themselves on social media changed substantially after events external to their personal lives. In particular, among a sample of trans Tumblr users, late 2016 involved increased negative affect and decreased self-disclosure for some. At the same time, use of social words related to family decreased for many, potentially signaling less contact with family.

The content trans women in our sample posted in late 2016 included significantly less self-disclosure than content from late 2015. Instead, we found the 2016 content to be more guarded and less open. This may signal a heightened awareness of the difficulties that trans people might face in an increasingly hostile environment, with uncertainties about trans rights and potentially less protection against discrimination and violence. The 2016 decrease in trans women's disclosure found in this work offers insight into disclosure behaviors online in the context of a political climate that is outwardly hostile to what one is disclosing. In addition to the elected administration, knowing that a substantial voter base elected such an administration may have also impacted people's social media content and posting behaviors. Knowing that some of these voters may be within one's personal network may have influenced people's social behaviors, as reflected in the decreased use of words related to family we found in this work. It may also be that post-election, people discussed political content more, in addition to or instead of personal content, which could explain the disclosure decrease. Future research should examine how people's personal vs. political social media content changes in response to their country's political climate.

Late 2016 content included significantly more negative affect and anger words for trans people. This may reflect difficulty coping with the country's changes and anger in response to what might come next; yet it may also be that using negative and angry language is itself a coping mechanism. Importantly, these changes in emotional affect were present even without posts being specifically written about political content (see Table 1). Most content was not *about* the US political climate, but the style in which it was written could have been *affected by* these factors. People continued to post about their lives and transition statuses, but these posts appear to have been tempered by larger outside forces.

Potentially troubling in this analysis is the decrease in social words related to family. Indicators in our data as well as outside reports signal that mental wellbeing challenges for this population were on the rise throughout 2016. However, rather than reach out to family, our data indicate that people may have turned away from these traditional support structures. It is possible that this turning away was therapeutic in light of friends and family who may not have provided such support, but it is equally possible that this choice was damaging from a mental wellbeing perspective. It could also be that, as found in previous work (Mehl and Pennebaker 2003), after a troubling external event people communicate more in dyadic face-to-face settings rather than in groups, which could explain the decreased social words in our dataset. A qualitative content analysis would be needed to investigate the nature of this decreased sociality. Specifically, such an analysis should examine whether and how communication shifts among family who share political views or do not after major political events.

Many of the fears trans Americans expressed in late 2016 (e.g., reduced healthcare access and bathroom rights) were in fact implemented in early 2017 (Peters, Becker, and Davis 2017). While the 2016 data we analyzed involves fears around potential policy changes, future research should analyze how social media affect changed in 2017 after the anticipated policies took effect and trans rights diminished.

Examining 2016 vs. 2015 Tumblr transition blogs gives insight into how social media affect changes in aggregate in response to a political climate outside of any individual poster's control. These changes may differ from the more personal transition milestones and retrogressions that occur in people's day to day lives as documented on their individual transition blogs, an analysis which we leave for future work. While in the course of one's transition much is uncontrollable (e.g., responses to disclosure, doctors' and psychi-

atrists' evaluations on readiness to transition, financial constraints, etc.), such upsets may feel more temporary and personally fixable than large external institutional changes.

These results can help both social media site designers and mental health professionals to build better mental wellbeing interventions to employ when outside factors affect large groups of marginalized people. While social services and online support communities already exist to help trans people with their personal transitions, and in dealing with issues such as trans health and coming out, few exist specifically to help people cope with the mental wellbeing effects of such large external factors. Social media data could signal when communities and individuals need help. In recent years, social media analytics have been used in unethical ways (Council for Big Data, Ethics, and Society 2016) and even possibly to impact 2016's election results (Grassegger and Krogerus 2017). Yet, if done ethically, analyzing people's emotions over time on an individual level, rather than in aggregate as we do here, could provide a way to offer support to those who most need it, when it may be most needed. Events like the 2016 election can serve as prompts to look for those who may most need help, and emotion over time can be employed as a metric to identify those most at risk. In this way, social media can be a powerful tool for helping those most at risk of mental wellbeing challenges.

Conclusion

We present the results of a study examining how social media word use related to emotional affect, disclosure, and sociality changed for a sample of trans people in 2016's political climate. For this particularly vulnerable group, negative affect and anger increased. At the same time, words related to family decreased, potentially indicating decreases in social interactions. Language indicating self-disclosure decreased for trans women in our sample, demonstrating that some may have begun self-censoring or substituting political content for personal content. Results highlight how large external events and the overall surrounding context can impact people's personal emotions and behaviors as communicated online.

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