



Elections Have Consequences for Student Mental Health: An Accidental Daily Diary Study

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Abstract

Polling suggested that the 2016 United States presidential election affected citizens' mood and stress levels. Yet, polling often fails to employ repeated measurement designs that can capture pre- and post-levels of change within the same person. In this study, undergraduate students ($N=85$) completed a 14-day daily diary where mood, stress, and mental health outcomes were assessed before and after the election. Multilevel modeling revealed an immediate upsurge in anxiety, stress, and poor sleep quality the day after the election, followed by a recovery period indicating these effects were short-lived. Other reactions (anger, fear, marginalization, and experiencing discrimination) evidenced a significant upsurge without a significant recovery. We consider how daily diary research designs like this one could be integrated into college settings to inform counseling center resource allocation, and we also comment on the promise of the daily diary methodology for political research.

Keywords

2016 presidential election, anxiety, discrimination, ecological momentary assessment, identity, mental and physical health, mental health, self-esteem, self-worth, social perceptions

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Introduction

The 2016 presidential election elicited significant reactions from citizens in the United States and around the world. For months and even days prior to the election, most prominent polls suggested that the Democratic candidate was more likely than the Republican candidate to win the presidential election (Helmut, 2017; Katz, 2016; Rothschild, 2016; Silver, 2016). Consequently, for some, the election was an unexpected pleasant event, while for others, an unexpected disappointment. Student reactions may be particularly important since many will have voted for the first time. Whether their candidate won or lost, college settings should aim to socialize students into having productive reactions and provide resources for individuals who are struggling. These aims would be facilitated if they could be guided by data. The present research is the first study to our knowledge that examines the psychological impact of an election in participants' daily life by making use of a daily diary methodology. We consider how such data can inform mental health centers on college campuses allocate resources and also discuss the potential of the daily diary methodology to understand nuanced political trends.

Approaches to measuring the psychological impact of an election

One method of quantifying the short-term impact of the 2016 presidential election is through nationally representative surveys. The Gallup-Healthways well-being index survey routinely collects information from Americans on their mood and stress levels (roughly 500 Americans sampled per day). A recent report (Davis, 2016) noted that while the average level of being in a bad mood (experiencing a lot of stress or worry without a lot of happiness and enjoyment) was at 11% since January 2008, this level rose to 19% on the day of and the day after the 2016 presidential election (5% margin of error at 95% confidence interval). This increase was larger than the increase seen in the previous two elections (3% to 6% increase), although within seven days, the bad mood level recovered to 12% (as it had in the previous two presidential elections).

Examining a longer timescale of months (early November 2017 to February 2017; Davis, 2017), levels of worry increased 4.1% following the 2016 election (0.52% margin of error), higher than the 0.9% increase observed following the 2008 election (0.38% margin of error). That increase led to an overall worry rate of 33.3%, the highest monthly average recorded since September 2011 (events that month included the U.S. debt ceiling crisis and downgrading of the U.S. credit rating). In this particular sample, stress increased following the election (1.1%) at a comparable rate to the 2008 presidential election (1.2%). These data are in accordance with the American Psychological Association (2017) survey on emotions and stress conducted in January 2017, which indicated that stress was significantly higher compared to earlier sampling timeframes.

Large polling surveys typically sample new individuals each day, leading to some amount of error in detecting change across time (e.g., has the average American become more worried or did the later surveys happen to oversample Americans who are more prone to worry generally). One method to account for this is to have a repeated-measures design, where participants serve as their own control. For instance, participants assessed before and after learning their presidential candidate was defeated demonstrated changes in objective stress (measured by changes in cortisol levels) on the day of the 2008 presidential election (Stanton, LaBar, Saini, Kuhn, & Beehner, 2010). Another study asked participants to report on emotions three to five weeks prior to the election and two days after the 2008 presidential election. Participants whose preferred candidate won reported increased positive-activated emotions, while participants whose preferred candidate lost reported increased negative-activated emotions (Scheibe, Mata, & Cartensen, 2011). Of note, activated (vs. deactivated) emotions demonstrated stronger effects, and the effects were stronger for younger adults.

Taken together, the existing research appears to focus on the constructs of emotions and stress following presidential elections. This research typically demonstrates an immediate upsurge of negative (activated) emotions and stress, followed by a gradual fall of these emotions and stress. Yet, much of this information relies on single-occasion surveys or repeated-measure designs with too few data points to evaluate nuanced patterns of change over time.

Daily diary assessment

Daily diary assessments (e.g., ecological momentary assessment and ambulatory assessment) are intensive repeated measurements that are completed in a participant's daily life over the course of time (typically a few days to a few weeks). For instance, participants may be asked to complete a nightly survey about the events of the day and their reaction to their day as a whole. These designs can minimize some forms of retrospective bias (e.g., errors related to memory biases, mood-congruent recall, belief of how events should have unfolded, etc.) and are said to be more externally valid because participants complete these measures in and about their daily life (Mehl & Conner, 2012). If an unexpected event occurs in the middle of such a study, researchers can evaluate the baseline levels for each participant and separately determine whether change has occurred immediately following the event as well as changes over time (e.g., Littleton, Grills-Taquechel, Axsom, Bye, & Buck, 2012).

The present study was designed to be a 14-day diary study, examining how personality affects psychological health in daily life. The study ran from 2 November until 12 December 2016, which happened to coincide with the 2016 presidential election on November 8. Although this study was not designed to

assess participant reactions to the election specifically, the fortuitous timing allowed for a fine-grained analysis of such reactions.

Consistent with previous research, we examined the outcomes of negative-activated/-deactivated emotions and stress. We anticipated an upsurge in these variables on the day after the election, followed by a recovery in the days following the election. We also examined other markers of psychological health (poor sleep quality and ineffective problem solving), social functioning (perceptions of being marginalized and being bothered by others), and discrimination to provide a broader spectrum of outcomes. We hypothesized a similar trajectory of next day upsurge of difficulties and a recovery in the days following the election.

Method

Participants and procedure

Participants were 85 students who completed at least one diary record on a day before and after the election. Participants were mostly female (80%) and college-aged ($M = 18.61$, $SD = 1.48$). The majority of the sample was white (75.3%), with lower rates of Hispanic (7.1%), Asian (7.1%), multi-racial (6%), African-American (2.4%), and other (2.4%).

Participants were recruited in person through introductory psychology courses. They emailed the researcher and were given a website link to complete the baseline survey. They then completed nightly diary records for 14 nights, with an email reminder each night containing the nightly diary website link. If participants missed a night, they would be emailed the next day to let them know they missed that record, and then the study was extended for them by one day so that they could meet the 14 diary record requirement. The participants completed 1122 records ($M = 13.20$, $SD = 3.98$) with 75.5% completing at least 14 records, and 90.6% completing at least 9 records. This study received institutional review board approval.

Measures

Daily outcome measures. Emotions were assessed on a -4 to 4 scale (including a zero point), with anchor points changing to reflect the emotions after asking, "Today I felt." The specific emotions were depressed (depressed vs. happy), emptiness (empty vs. excited), anxiety (anxious vs. calm), anger (angry vs. content), and fear (fearful vs. safe). Stress was rated as "How much stress did you experience today" ranging from 0 (none) to 8 (extreme). Sleep quality was rated as "How would you rate your sleep quality from last night" on a 1 (very bad) to 4 (very good) scale (item from Pittsburgh Sleep Quality Index; Buysse, Reynolds, Monk, Berman, & Kupfer, 1988). This variable was shifted back one day in the

dataset to correspond to the current night sleep quality. Ineffective problem solving was rated as “I was generally effective at solving the problems I faced today,” ranging from -4 (strongly disagree) to 4 (strongly agree). Marginalization was rated as “Today people made me feel,” ranging from -4 (marginalized) to 4 (empowered). Being bothered by others was rated as “Today I was bothered/annoyed/frustrated by other people,” ranging from -4 (strongly disagree) to 4 (strongly agree). Items were reverse scored so that higher scores indicated worse functioning (i.e., reverse scored emotions, sleep quality, problem solving, and marginalization). Discrimination that day was indicated using a dichotomous checkbox, “experienced race, gender, or age discrimination.”

Statistical analyses

Repeated measurement research designs violate the independent and identically distributed assumptions employed in many regression analyses. Multilevel modeling is an analytic method that can be used to accommodate such dependencies found within nested data (days nested within participants) while obtaining proper standard errors (Snijders & Bosker, 1999). We identified a within-person (level 1) random intercept and slope model that captured the prototypical trajectory expected by prior research.

$$\begin{aligned} \text{Outcome}_{di} &= \beta_{0i} + \beta_{1i}(\text{Nov}8_{di}) + \beta_{2i}(\text{Nov}9_{di}) + \beta_{3i}(\text{Days After}_{di}) + e_{di} \\ \beta_{0i} &= \gamma_{00} + u_{0i} \\ \beta_{1i} &= \gamma_{10} + u_{1i} \\ \beta_{2i} &= \gamma_{20} + u_{2i} \\ \beta_{3i} &= \gamma_{30} + u_{3i} \end{aligned}$$

where outcome refers to each outcome experienced by a person (i) on each day (d). Nov8 refers to the day of the election (coded as 1 on November 8, and zero on all other days). Nov9, similarly, was coded as 1 on November 9 and zero on all other days. The “days after” variable was coded as one on November 10, and then was coded sequentially in the days following this date. Because of this coding, the intercept (β_{0i}) can be interpreted as an individual’s baseline level of the outcome before the election, β_{1i} represents the association with outcomes on Election Day, β_{2i} represents the association with outcomes on the day after the election, and β_{3i} represents the association with outcomes in the days following the election. The fixed effects (γ_{00} – γ_{30}) quantify a single score that represents the average association in the sample, while the random effects (u_{0i} – u_{3i}) allow for individual differences around each average. Thus, this model extends previous research by considering multiple timescales (day after vs. days following) to quantify change.

All multilevel modeling was completed in SAS 9.4 (Littell, Miliken, Stoup, & Wolfinger, 1996) with missing data treated as missing at random. A variance component structure was used for level-2 effects. Continuous outcomes were modeled using SAS' PROC MIXED and the dichotomous outcome was modeled using SAS' PROC GLIMMIX.

Results

Descriptive statistics for variables used in this study are listed in Table 1. The intraclass coefficients ranged from 0.23 to 0.45 for the daily-level variables, suggesting that one-quarter to one-half of the variance is due to between-person differences, while the remaining variance is due to within-person changes and error. Because of this, a multilevel model is a reasonable statistical approach to simultaneously model variation at the between-person and within-person level.

Impact of the election on daily life outcomes

The impact of the election across various outcomes is presented in Tables 2 and 3 (see Figure 1 also). We hypothesized a significant upsurge on the day following the election (positive association), and then a subsequent recovery on the days after the election (negative association). For instance, anxiety at baseline was -1.13 (on a -4 to 4 scale), and the day following the election

Table 1. Descriptive statistics for variables in study.

	<i>M</i>	<i>SD</i>	Intraclass coefficient
Depression	-1.65	2.14	0.41
Empty	-1.40	2.17	0.44
Anxious	-1.34	2.40	0.42
Angry	-1.84	2.13	0.36
Fearful	-2.16	2.13	0.45
Stress	3.03	2.22	0.35
Bad sleep quality	2.09	0.77	0.23
Ineffective problem solving	-1.60	1.87	0.40
Marginalized	-0.76	1.65	0.43
Bothered	-1.30	2.61	0.38

Note: Means and standard deviations for all variables were calculated using the total observation sample size (roughly 1122 observations, with some small fluctuations due to certain variables having data missing at random). Daily variables on a 9-point scale ranging from -4 to 4 (depression, empty, anxious, angry, fearful, ineffective problem solving, marginalized, bothered), or 0 to 8 (stress). Sleep quality ranged from 1 to 4 .

(November 9) increased anxiety ($\gamma_{20} = 0.77, p = .0013$) and then began to slowly diminish across subsequent days ($\gamma_{30} = -0.05, p = .0061$). A similar pattern was found for the other negative-activated emotions of anger and fear, observing an upsurge on November 9. However, the recovery slope was not significant. Depression and emptiness were not significantly higher on the day following the election (though there was a decrease in emptiness in the days following the election). Both depression and emptiness are negative-deactivated emotions.

Table 2. Multilevel associations between election days and emotions.

	Depressed		Empty		Anxiety		Anger		Fear	
	Est.	SE								
Intercept, γ_{00}	-1.60	0.17	-1.16	0.17	-1.13	0.19	-1.83	0.16	-2.28	0.17
Nov8, γ_{10}	0.30	0.24	0.26	0.22	0.42	0.27	0.45	0.24	0.27	0.21
Nov9, γ_{20}	0.42	0.23	0.39	0.22	0.77	0.24	0.79	0.24	0.93	0.24
Days after, γ_{30}	-0.02	0.02	-0.04	0.02	-0.05	0.02	-0.02	0.02	0.00	0.02
Intercept variance, u_{0i}	1.91	0.34	2.04	0.36	2.47	0.44	1.64	0.30	1.92	0.33
Nov8 variance, u_{1i}	0.96	0.66	0.41	0.57	1.54	0.86	0.92	0.66	0.81	0.54
Nov9 variance, u_{2i}	0.89	0.63	0.46	0.56	0.66	0.69	1.23	0.69	1.99	0.71
Days after variance, u_{3i}	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.00
Residual variance, e_{di}	2.63	0.13	2.61	0.13	3.18	0.16	2.72	0.13	2.10	0.10

Note: Bold = $p < .05$. Est: Unstandardized estimates.

Table 3. Multilevel associations between election days and health/social functioning.

	Stress		Poor sleep		Marginalized		Prob. Solve		Bothered	
	Est.	SE								
Intercept, γ_{00}	3.43	0.17	2.16	0.05	-0.71	0.13	-1.60	0.14	-0.92	0.20
Nov8, γ_{10}	0.91	0.22	0.28	0.09	0.34	0.19	-0.08	-0.19	0.51	0.28
Nov9, γ_{20}	0.80	0.22	-0.02	0.10	0.61	0.17	-0.21	0.21	0.50	0.29
Days after, γ_{30}	-0.08	0.02	-0.02	0.01	-0.01	0.01	-0.01	0.01	-0.07	0.02
Intercept variance, u_{0i}	1.74	0.32	0.15	0.03	1.06	0.19	1.34	0.24	2.68	0.48
Nov8 variance, u_{1i}	0.10	0.56	0.05	0.09	1.01	0.42	0.24	0.41	0.79	0.90
Nov9 variance, u_{2i}	0.35	0.59	0.16	0.11	0.74	0.36	0.95	0.51	1.59	0.99
Days after variance, u_{3i}	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Residual variance, e_{di}	2.87	0.14	0.47	0.02	1.31	0.06	1.93	0.09	4.06	0.20

Note: Bold = $p < .05$. Est: Unstandardized estimates; Prob. Solve: ineffective problem solving.

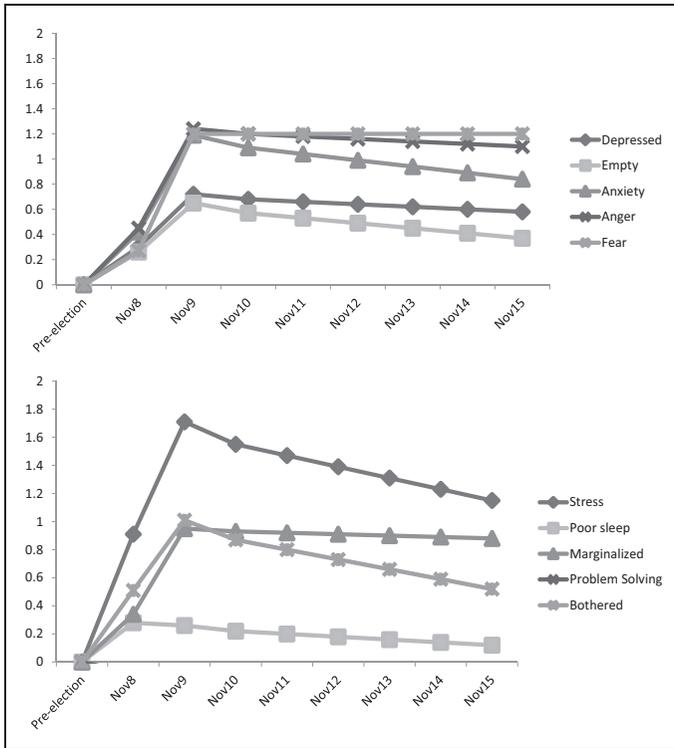


Figure 1. Model implied trajectories for outcomes across election days. Note. Intercept values not plotted, and instead each line begins at zero. Unstandardized beta weights used for November 8 and 9, and the model implied decrease in days following the election used to plot the remaining dates. The X-axis ended on November 15 for convenience. Most variables were on a 9-point scale (-4 to $+4$ for depressed, empty, anxiety, anger, fear, problem solving, marginalized; $0-8$ for stress), while sleep was on a 4-point scale (thus the magnitude appears smaller). The beta weights for problem solving were not significant, and since slightly negative, do not appear in the plotted area above.

Thus, the pronounced impact of negative-activated (vs. deactivated) emotions was consistent with our hypothesis and previous research using a different methodology.

Also consistent with our hypothesis, stress upsurged significantly on November 8 and 9, followed by a decrease (recovery) in the days following the election. Sleep quality problems upsurged on November 8, followed by a recovery. Marginalization upsurged on November 9, with no significant recovery. Being bothered by others did not upsurge on November 8 or 9, but did evidence a decline in the days following the election, and ineffective problem solving had no significant associations.

Discrimination was a dichotomous variable (29 incidents reported across 1122 records), with November 8 and 9 treated as fixed and random effects, but the “days after” variable treated only as a fixed effect to allow for model convergence. The overall baseline likelihood of discrimination was low (estimate = -6.78 , $SE = 0.46$, $p < .0001$), and was no different on November 8 (estimate = -1.04 , $SE = 1.46$, $p = .4749$) or the days since the election (estimate = $-.04$, $SE = 0.03$, $p = .1406$), but on November 9, there was a significant upsurge (estimate = 1.69 , $SE = 0.77$, $p = .0272$) reflecting an odds ratio of 5.44 times more likely to experience discrimination on the day following the election (1.21–24.40, 95% confidence interval).

Discussion

The present study examined how the election results influenced the psychological health of college students. The findings are largely in accord with Gallup poll research, which also showed a significant increase in negative (activated) emotions and stress on the day after the election. The current study also indicated poorer sleep quality on the night of the election, next day feelings of being marginalized, and a 5.44 times increased likelihood of experiencing discrimination the day after the election. Importantly, these findings control for an individuals’ baseline level, meaning that the upsurges represent changes in the participants’ daily life from their usual experiences. Taken together, the 2016 presidential election appeared to have a negative impact on the mental health of students in their daily life and across several areas of functioning.

The longitudinal design also permitted investigation of a recovery trajectory (negative association in days following the election). Some outcomes evidenced an upsurge followed by a recovery trajectory (anxiety, stress, and sleep), indicating these effects were short lived. Other outcomes evidenced an upsurge without a decrease in subsequent days (anger, fear, and marginalization), which could suggest longer term effects for these outcomes.

Implications for student mental health

Student mental health is an important issue, as 18- to 24-years-old represents both a typical college age and a sensitive period for higher rates of emerging psychiatric disorders (Kessler et al., 2005). The counseling literature has become increasingly concerned about a growing number of students with mental health problems (see Mowbray et al., 2006) and the existing capacity of resources on college campuses to provide support for students.

The present research indicated that the 2016 presidential election had an impact on student mental health. An efficient intervention would address the outcomes that appear more sustained. In this case, anger, fear, and

marginalization may be considered together as representing a core concern for students. This could be addressed in a processing group that helps the students to feel validated for their reactions, while also opening up a dialogue about productive ways to process their anger (e.g., effective/ineffective ways of expressing an opinion toward someone with an opposing view, etc.). Many factors contribute to the feeling of marginalization, and these factors are increasingly understood through multiple layers (individual, professional, organizational, and societal). Universities should strive to promote initiatives that can further a message of inclusivity through each of these layers (Sue, 2001; see also Simone, 2012). Providing resources regarding the exacerbation of student marginalization may be particularly important, given that an increasing number of students are coming from marginalized groups (Osborne, 1996). As well, providing more resources to cope with increased fear and anger following an election may hold importance given that these have been theorized to inhibit learning in the classroom (Perry, 2006). The present research suggested that generic interventions aimed at stress reduction, problem solving, sleep hygiene, or processing negative-deactivated emotions may not be as effective because these effects were relatively short-lived (or not significant), and such interventions come with an opportunity cost of limiting the resources directed at processing the longer lasting outcomes.

Ultimately, the usefulness of this research at our university was limited because it was not designed to rapidly examine the data in order to guide mental health resource allocation. But in future semesters, especially those with a known event occurring like a presidential election, universities could collect data more systematically and be prepared for quick implementation of trends. For instance, one benefit of collecting a more representative sample is that one can examine individual differences in these daily associations. If there is a group of students at a higher risk for negative outcomes, one could identify these groups and provide additional resources for them. This particular study did find that certain demographic characteristics amplified the upsurge of negative outcomes, but with such a small convenience sample, even statistically significant findings are viewed as too tenuous to report. Outside of a presidential election, there are likely other known events occurring on a college campus that researchers and counseling centers could collaborate on to inform mental health resource allocation.

Implications for political research

With a sample of 85 students, it is not possible to generalize these findings to the nation at large (though the results did largely accord with Gallup polling data). The main implication comes from our demonstration that a daily diary approach can provide a nuanced perspective into the real-life impacts of politics. With the correct data (e.g., representative sample, large enough data points per

participant), political researchers could examine within-person changes in a variety of interesting topics (viewpoints, candidate preferences, voting likelihood, support for legislation, etc.) as well as individual differences (e.g., demographics, district location, etc.) in these within-person changes. Thus, future political research may benefit from integrating the daily diary methodology into existing strategies of evaluating political topics.

Limitations

This study has several limitations, which can be organized by participant sample, variables, timescale, and analyses. Regarding participants, this was a reasonable sample size for a daily diary study, but a small sample size to generalize towards national reactions of an election. The Gallup poll information could also compare their 2016 sample with other election years to draw contrasts, while this sample is exclusively in the year 2016. Thus, in four years, we may find that these day-after upsurges and recoveries are not unique to the 2016 election, but are common for any election. Future research would benefit from replicating this study, and employing similar methodologies during known points of flux for Americans (e.g., elections, holidays, and transitions in work or life circumstances) to better understand the dynamics associated with these events.

Variables. It is disappointing that we do not know political affiliation, as Democrats may have had a more pronounced reaction compared to Republicans. While we do not know political affiliation in this study, open-ended optional text responses evinced 16 election-related comments, with only two being positive towards the Republican candidate.

Timescale and statistical analyses. With only 14 data points, more sophisticated time series analyses could not be conducted (e.g., dampened linear oscillator models). It is possible a more nuanced temporal modeling for the days following the election would have resulted in different (though more complex) findings. The daily timescale was appropriate to capture change as it was anticipated to occur (within a few days); however, different results may emerge (or be obfuscated) on a different timescale (e.g., hours, weeks, months, etc.). Finally, multilevel models rely on strong assumptions in specifying a homogeneous within-person model (even if individuals can differ in the strength of associations with those within-person parameters), and that between-person differences organize into a multivariate normal distribution. With more data-points, individualized models might be run to better understand the idiographic patterns of change and guide person-specific treatment interventions (Fisher & Boswell, 2016; Roche, Pincus, Rebar, Conroy, & Ram, 2014).

Despite these limitations, the existing research adds nuance to existing polling data that suggested a short-term negative outcome on psychological health following the election. We then discussed how this data could be linked to practical resource allocation in college health centers. We hope future studies can leverage the daily diary methodology to gain nuanced insights into daily processes, whether that focus is on national elections or college-level mental health.

Declaration of Conflicting Interests

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