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Social Media and Mental Health: The Public Health Impact and Future Policy Directives

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Social Media and Mental Health: The Public Health Impact and Future Policy Directives

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Public Policy

by

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Abstract

The relationship between social media use among young people and the increasing concerns of mental health problems in the U.S. and globally is on systemic agendas. Furthermore, research on social media use and mental health indicate reasons to suspect a causal relationship, but more work needs to be done. Therefore, this three-article dissertation seeks to explore (1) associations between social media use, personality, and depression; (2) associations between social media emotional support, anxiety, and personality; and (3) the relationship between social media use and mental health using Deborah Stone's causal stories framework. Findings from this study provide an improved understanding of the relationship between social media use and mental health and suggest ways in which public health professionals and policy makers can begin to address the policy problem.

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Acknowledgements

This dissertation was inspired by my past experiences I have shared with close friends and loved ones who had problems with depression and anxiety and were impacted by the nature of social media use. My objective is to inform the public of the multifaceted impact social media has on our lives and the realization that we can begin to take steps to build healthier relationships with kindness and understanding. Media literacy with a focus on empathy would be a step toward improving our social media experiences and understanding how policy impacts us daily can improve future solutions.

The completion of this dissertation would not have been possible without the many experts and professionals who helped facilitate my growth. First, I would like to express my sincere gratitude to Dr. Brian Primack, whose mentorship, encouragement, and support lead to my intellectual success and growth as an emerging scholar. I appreciate and admire you very much, Dr. Primack.

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Finally, this life achievement would not have been made possible without all the loving support of my family and close friends – I love and appreciate you all.

Dedication

In loving memory of my mother, Kelley D. Merrill. My mother's life was a true testimony of mercy, grace, compassion, and love. I would not be successful today without her loving guidance and encouragement throughout my life.

Table of Contents

Chapter I.....	1
1. Introduction: Purpose of Research	1
Chapter II	3
Abstract	3
1. Introduction	4
2. Method	8
3. Results	11
4. Discussion	17
5. Limitations	21
6. Conclusion	22
Chapter III.....	28
Abstract	28
1. Introduction	29
2. Method	33
3. Results	35
4. Discussion	38
5. Limitations	40
6. Conclusion	41
Chapter IV	47
Abstract	47
1. Introduction	48
2. Research Design.....	52

3. Findings.....	59
4. Limitations	79
5. Discussion-Conclusion	79
Chapter V	84
1. Conclusion: Summary of Research, Future Research, and Policy Recommendations	84

List of Tables

Table 2.1. Bivariable associations and sociodemographic characteristics	13
Table 2.2. Bivariable and multivariable associations for depression.....	16
Table 3.1. Means and standard deviations of social media emotional support.....	36
Table 3.2. Regression coefficients of the predictors and interaction terms	38
Table 4.1. Newspaper Articles Analyzed	55
Table 4.2. Narrative Topics and Themes	57

List of Figures

Figure 3.1. Social media emotional support, personality, and anxiety40

List of Published Papers

- Chapter II Merrill, RA, Cao, C, & Primack, BA (2022). Associations between social media use, personality structure, and development of depression. *Journal of Affective Disorders Reports, 10*, 100385. <https://doi.org/10.1016/j.jadr.2022.100385>

Chapter I

1. Introduction: Purpose of Research

The purpose of this research is to further explore the relationship between social media and mental health among young adults. Contributing to both the public health and policy literature, each chapter explores either a health or policy component that evaluates the current landscape of social media and its relationship to the mental health of young people. Findings from these studies may help public health professionals and policy experts develop recommendations that will improve not only the social media experience in young users and their families, but create a valuable foundation for further inquiry.

Chapter II analyzes the associations between social media use, personality, and the development of depression among a national sample of young adults. How these associations differ among people with various personality characteristics is not completely understood. Logistic regression is used to investigate the development of depression over time. Specific personality characteristics demonstrated different risks for depression, for agreeableness and neuroticism respectively. Social media use is also strongly associated with depression regardless of personality.

Chapter III further explores these relationships by utilizing the same longitudinal dataset to investigate the associations between social media emotional support, anxiety, and personality. The mechanisms between social media use and anxiety have been rather limited in the scholarly literature. Factorial analysis of variance (ANOVA) and multiple regression are used to examine relationships between social media use and anxiety. Social media emotional support may be linked with a reduction in anxiety, and this relationship appears to be more pronounced in

females. Specific personality traits may also be linked with differences in perceived social media emotional support.

Chapter IV focuses on public policy. This is the first study to apply Deborah Stone's causal stories framework to the relationship between social media use and mental health using media-related sources to analyze narratives during a time of growing public concern and governmental attention. Directed content analysis is used to analyze newspaper articles from 2018-2023. Findings show a construction of competing stories. Proponents of government regulation use an intentional/complex causal narrative to emphasize that major social media companies are to blame for harmful content that leads to mental health problems among young people. Opponents of government regulation use an inadvertent/complex causal narrative that deemphasizes intentional behavior on the part of social media companies while emphasizing the benefits of social media and the benefits of self-regulation.

In closing, Chapter V summarizes the findings, makes suggestions for future research, and provides policy recommendations.

Chapter II

Associations between social media use, personality structure, and development of depression

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Abstract

Background: While longitudinal studies demonstrate associations between social media use and development of depression, it is not clear whether these associations differ among people with various personality characteristics.

Methods: Data were obtained from a national sample of 978 individuals ages 18-30. Measures used included the Patient Health Questionnaire assessing depression, the 10-item Big Five Inventory assessing personality, and self-reported use of the top 10 social media platforms. Logistic regression determined associations between each personality characteristic (openness, conscientiousness, extraversion, agreeableness, and neuroticism), social media use, and development of depression over 6 months.

Results: In multivariable analyses that adjusted for all covariates, compared to people with low agreeableness, those with high agreeableness had 49% lower odds for developing depression

(OR=0.51, 95% CI=0.33, 0.80). Compared to people with low neuroticism, those with high neuroticism had more than double the odds for developing depression (OR=2.46, 95% CI=1.57, 3.87). For each personality characteristic, increased social media use was significantly associated with developing depression. Interaction terms showed that associations between social media use and developing depression did not vary according to any of the personality characteristics.

Limitations: Because we assessed young adults ages 18-30, inferences cannot be made to other age groups.

Conclusions: The fact that agreeableness and neuroticism were associated with different risks for developing depression may help practitioners target high-risk populations. Because social media use was strongly associated with development of depression for all personality characteristics, it may be useful for interventions to target reduction of social media use overall regardless of personality type.

1. Introduction

Depression is at epidemic levels in the United States, and it is now the leading cause of disability (World Health Organization, 2020) and mortality (Walker et al., 2015) worldwide. About one in six people develop depression within their lifetime, and average age of onset appears in the late teens to mid-20's (Wilson et al., 2015). Depression increases the risk for multiple other psychological conditions, including anxiety (Mineka et al., 1998) and suicide (World Health Organization, 2020). It has also been connected to worsening of physical conditions such as heart disease, cancer, and diabetes (Moussavi et al., 2007; Scott et al., 2016). Depression is influenced by many factors, including life circumstances (Fergusson and Horwood, 1987; Kendler et al., 1999), hormone levels (de Kloet et al., 2005), inflammation

(Setiawan et al., 2015), and heredity (Kendler et al., 2006). Therefore, it is especially important to further understand the underlying effects of this condition.

Recently, studies also have connected depression with social media use (SMU). Average SMU in the U.S. is 2-4 hours per day (Primack and Escobar-Viera, 2017), and use is especially high among young adults, who are still developing (Pew Research Center, 2021). In fact, the emotional and cognitive regions in the frontal and temporal areas of the brain continue to develop until early adulthood (Lebel and Deoni, 2018), and personal identity development and self-esteem may promote healthy transitions across the lifespan. One national longitudinal study recently found that people who used the most social media were three times as likely to become depressed over the subsequent 6 months compared with people who used the least social media (Primack et al., 2021). There are multiple possible reasons why social media and depression might be connected. For example, large amount of time spent on social media might supplant more valuable human face-to-face contact (Whaite et al., 2018). Social media also may encourage problematic social comparison (Lee, 2014). Finally, the milieu of social media may increase miscommunications resulting in relationship difficulties and subsequent risk for developing mental health problems (Mazer and Ledbetter, 2012).

Although numerous factors pertain to the development of depression, personality has been an important area of study for understanding and predicting human behavioral conditions, with one's environment playing a key role in its development (Winne and Gittinger, 1973). Additionally, it is unknown how social media may impact personality development. It may be that social media may become a catalyst for promoting personality awareness. Currently, studies have shown that personality traits have been in the past related to both depression (Kotov et al., 2010) and patterns of consuming media (Finn, 1997; Özgüven and Mucan, 2013; Gil De Zuniga

et al., 2017; Brailovskaia and Margraf, 2018). Personality traits are also related to psychological processes that may mediate associations between SMU and depression, such as sensitivity to miscommunications or social comparisons (Correa et al., 2010; Mark and Ganzach, 2014; Hakulinen et al., 2015; Gil De Zuniga et al., 2017; Allen et al., 2018).

The Five-Factor Model (FFM) is a widely accepted theory of personality and includes five broad dimensions: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (McCrae and Costa Jr., 2008) – each of these key traits has been associated with other psychological factors and behaviors (Klein et al., 2012). For example, neuroticism has been associated with mental health concerns (McCrae and Costa Jr., 2008; Kotov et al., 2010; Watson and Naragon-Gainey, 2014; Speed et al., 2019). Extraversion may act as a protective factor against specific certain mental health conditions (Kotov et al., 2010; Watson et al., 2015; Watson et al., 2019). Openness to experience, an understudied trait (Shiner, 2007; Khoo and Simms, 2018) generally has not been positively or negatively related to depression in prior studies (Malouff et al., 2005; Kotov et al., 2010). Agreeableness is connected with prosocial emotions, cognitions, and behaviors (Habashi et al., 2016) and has been related to lower risk for emotional conditions such as depression (Mongrain et al., 2018). Finally, Conscientiousness may be negatively correlated with depression (Kotov et al., 2010; Bartley and Roesch, 2011; Allen et al., 2018).

However, it is not yet sufficiently known how these various personality characteristics interact with associations between SMU and depression. Better understanding whether those with certain personality profiles are at higher risk for development of depression based on SMU could aid in the development of more effective tailored interventions to reduce the burden of depression.

It may be that people with certain personality characteristics are at particularly high risk for developing depression with increased SMU. For example, Whaite et al., (2018) found that for people who tested as conscientious, there was no association between increased SMU and perceived social isolation. However, for people who tested as lacking in conscientiousness, compared with those with low SMU, those with high SMU were three times likely to have perceived social isolation. Nevertheless, the data used in this study were cross-sectional, and to our knowledge published longitudinal studies have not examined associations among personality type, SMU, and development of depression over time.

Therefore, the purpose of this study was to assess associations between SMU, personality characteristics, and the development of depressive symptoms 6 months later in a national sample of young adults without depression at baseline. Better understanding these relationships will help public health practitioners and policy makers to develop and implement tailored and more effective prevention and treatment programs for depression. Based on prior work in different contexts in this area, including a large meta-analysis (Kotov et al., 2010) and a longitudinal study exploring predictors of depression (Noteboom et al., 2016), we expected that neuroticism would be associated with increased risk of developing depression within 6 months (**Hypothesis 1a**), that conscientiousness and extraversion would be associated with lower risk of development of depression within 6 months (**Hypothesis 1b and 1d**) and that there would be no association for agreeableness and openness to experience, respectively (**Hypotheses 1c and 1e**). Based on prior cross-sectional data, we expected that the association between SMU and development of depression would not significantly differ based on four personality characteristics (**Hypotheses 2a, 2c, 2d, and 2e** for neuroticism, agreeableness, extraversion, and openness to experience). However, based on the results of Whaite et al., (2018), we hypothesized that the association

between SMU and development of depression would differ according to conscientiousness, with non-conscientious individuals being more likely than conscientious individuals to develop depression based on similar levels of social media exposure (**Hypothesis 2b**).

2. Method

Research Design, Procedures, and Participants

Qualtrics Sampling Services was used for participant recruitment and engagement from March to September 2018. Participants were assessed twice; once at baseline and once approximately 6 months later. Prior research related to depression, as well as other related mental health conditions, has commonly used similar time frames (e.g., Angstman et al., 2012; Blomdahl et al., 2021; Craske et al., 2019). Examination of depression at 6 months is clinically supported. For example, the CMS (Centers for Medicare & Medicaid Services) specify in their Merit-Based Incentive Payment System (MIPS) that it is important to examine depression outcomes at 6 months (Centers for Medicare & Medicaid Services, 2019). Exact means and standard deviations were 170 days (5.7 months) and 51 days (1.7 months, respectively). Qualtrics partners with web-based panel providers and specializes in survey data collection among a diverse group of respondents (Ibarra et al., 2018). A “balanced start” sampling methodology was used for recruiting participants to represent the U.S. population in terms of age, sex, race, geographic region, education, and household income. Participants were required to be 18-30 years old, read English, and record their responses using an online interface. Informed consent was provided, and the research was approved by the University of Pittsburgh Institutional Review Board. Survey participants were compensated for their time with redeemable incentives, such as gift cards.

Measures

Depression. Depression was evaluated at baseline and follow-up using the 9-item Patient Health Questionnaire (PHQ-9), which asks about feelings and/or experiences of depression within the past 2 weeks, such as “thoughts that you would be better off dead, or of hurting yourself.” For all items, response options were “none” (0) to “all the time” (3) with two other categories in the middle. All 9 responses were then summed to create a scale that ranged from 0 to 27. Depression was categorized as yes or no using a previously-validated cut point of 10 (10 and above was categorized as depressed, 0-9 as nondepressed) (American Psychiatric Association, 2013).

Social Media Use. SMU was assessed by asking respondents how much daily time was spent on the top 10 social media platforms in hours and minutes for personal use. Participants were specifically instructed not to include time spent on social media for work. At the time of the study, the top ten social media sites were Facebook, YouTube, Instagram, Snapchat, WhatsApp, Twitter, Pinterest, Reddit, LinkedIn, and Tumblr, and so each of these was asked about separately to improve data quality. For the purposes of analysis, respondents were divided into quartiles based on SMU.

Personality. Personality was measured using the 10-item Big Five Inventory (BFI-10), which assesses the following personality traits: openness, conscientiousness, extraversion, agreeableness, and neuroticism (Gosling et al., 2003). Items were formatted as “I see myself as someone who...” followed by a characteristic of specific personality traits. Participants responded to 2 items for each personality trait on a 5-point likert scale (1=“strongly disagree”, 5=“strongly agree”). Five of the items were reverse coded so that a higher score represented a lower indicator of the personality trait. The sum of the two items of each personality trait ranged

from 2 to 10. The score of each item was 3 if the respondents answered “Neither agree nor disagree,” which was neutral. Thus, if the respondents provided a neutral answer to both items of the personality trait, the sum of the personality characteristics was 6. Therefore, we used 7 as a cut-off for having the trait (a sum of 7-10) or not having the trait (a sum of 2-6).

Covariates. Covariates for this study included age, gender, ethnicity, and household income. Age was divided into three categories (18-20; 21-24; 25-30) based on clinical implications of development within the field of public health. For example, 18-20 was in the same category—without 21—because 21 is an important marker for the legal age of alcohol/cigarette use. Participants self-reported their sex (male or female) and race/ethnicity (White, non-Hispanic; Black, non-Hispanic; Hispanic-Latino; Asian; or Other). Annual household income (less than \$25,000; \$25,000-\$50,000; \$50,000-\$75,000; or \$75,000 or above) was also assessed.

Data Analysis

Because we were interested in development of depression over time, analyses were restricted to respondents who were nondepressed at baseline. For primary analyses, the dependent variable for each analysis was the dichotomous variable indicating whether a participant had developed depression, defined as a PHQ-9 score of 10 or above by follow-up (American Psychiatric Association, 2013; Levis et al., 2019). Therefore, logistic regression was the appropriate analysis. The primary independent variable was SMU divided into quartiles (Q1=lowest SMU and Q4=highest SMU).

To examine potential interactions between personality traits and SMU, we conducted five separate logistic regression analyses, one for each personality trait. In each model, we included one of the personality traits (e.g., extraversion) as well as the relevant interaction term (e.g.,

extraversion x SMU). Because no interaction term was statistically significant, in subsequent multivariable logistic regressions interaction terms were not included. Analyses controlled for all measured sociodemographic variables, which included age, gender, ethnicity, and annual household income. Power calculations determined that our sample size of 978 should be sufficient to determine interactions with even small-to-moderate effect sizes.

In order to test the robustness of our results, we conducted three sets of sensitivity analyses, which were determined *a priori*. For the first, we used the depression cutoff of 11 instead of 10 because this has been used in some studies (Manea et al., 2012). For the second set of sensitivity analyses, we treated SMU as a continuous variable instead of an ordered categorical variable. Finally, for a third set of sensitivity analyses we included only covariates with bivariate associations with the outcome of $p < 0.15$ (instead of including all sociodemographic factors in all models).

We did not correct for multiple comparisons according to our *a priori* protocol because each analysis tested a specific hypothesis, even if we had corrected for multiple comparisons (using a Bonferroni or other similar correction), all results would have been similar in terms of level of significance.

All statistical analyses used Stata, version 15.0. Statistical significance was represented by a 2-tailed p-value of < 0.05 .

3. Results

There were 1289 individuals at baseline, but 311 were removed for meeting criteria for depression or for having incomplete data. Among the remaining 978 non-depressed individuals at baseline, 93 (9.5%) developed depression by the 6-month follow-up. **Table 2.1** provides the

sample descriptors and compares those who developed depression within 6 months to those who did not in terms of baseline SMU, personality traits, and other sociodemographic characteristics. The sample was 54.6% female, 71.1% White, 6.2% Black, 12.2% Hispanic, and 9.5% Asian, and the median age was 28 years. Overall, 12.5% of respondents reported an annual household income less than \$25,000, with 38.0% reporting \$75,000 or above.

Table 2.1. Bivariable associations with development of depression and sociodemographic characteristics from sample (N = 978)

Study Variables	Percent	Developed Depression within 6-Months ^a		P Value ^b
		No 885 (90.5%)	Yes 93 (9.5%)	
SMU^c				<.05
Q1 (0-120)	30.9	32.2	18.3	
Q2 (121-195)	29.2	30.0	22.6	
Q3 (196-300)	25.0	24.2	32.3	
Q4 (≥301)	15.0	13.7	26.9	
Personality Trait				
Openness				
Yes	47.0	47.0	47.3	
No	53.0	53.0	52.7	
Conscientiousness				
Yes	70.3	71.2	61.3	
No	29.8	28.8	38.7	
Extraversion				
Yes	31.0	30.9	32.3	
No	69.0	69.2	67.7	
Agreeableness				
Yes	58.5	59.9	45.2	
No	41.5	40.1	54.8	
Neuroticism				
Yes	32.4	30.4	51.6	
No	67.6	69.6	48.4	
Age, y				
18-20	3.6	3.3	6.5	
21-24	12.4	12.1	15.1	
25-30	84.1	84.6	78.5	
Sex				
Female	54.6	54.4	57.0	
Male	45.4	45.7	43.0	
Race				
White, non-Hispanic	71.1	71.8	64.5	
Black, non-Hispanic	6.2	6.2	6.5	
Hispanic-Latino	12.2	11.9	15.1	
Asian	9.5	9.2	12.9	
Other ^d	1.0	1.0	1.1	
Annual Household Income				
<\$25,000	12.5	12.1	16.1	
\$25,000-\$50,000	26.6	26.4	28.0	
\$50,000-\$75,000	22.9	22.6	25.8	
≥\$75,000	38.0	38.9	30.1	

Abbreviations: AOR = adjusted odds ratio; CI = confidence interval.

^a Development of depression was measured using the 9-item Patient Health Questionnaire (PHQ-9) using a previously-validated cut off of 10. This variable represents the development of depression over 6 months, with non-depressed participants at baseline. Analyses controlled for sociodemographic variables represented within the model.

^b P value derived from chi square analyses.

^c Social media use (SMU) includes self-reported data and was divided into quartiles (Q1-Q4) based upon time (in minutes) per day.

^d American Indian/Native Alaskan, Native Hawaiian/Pacific Islander, and multiracial represent the other race category. Due to the very small sample size for each of these race categories, separating them was not necessary for the purpose of this analysis.

For each personality trait, there was a strong bivariable association between baseline SMU and the development of depression (**Table 2.2**). Increased SMU was strongly and linearly associated with development of depression. For example, compared with those in the lowest quartile of SMU, those in the highest quartile had odds ratios of 3.01 to 3.35 for developing depression (all $p < .01$). Interaction terms between personality traits and SMU were all non-significant, indicating that the strength of the association between SMU and depression did not significantly vary among people with or without each personality characteristic.

In multivariable analyses that adjusted for all covariates, compared to people categorized with low agreeableness, those with high agreeableness had 49% lower odds for developing depression (OR=0.51, 95% CI=0.33, 0.80). Compared to people with low neuroticism, those with high neuroticism had more than double the odds for developing depression (OR=2.46, 95% CI=1.57, 3.87). As shown in **Table 2.2**, there was no association between the other three

personality traits (openness, conscientiousness, and extraversion) and development of depression.

As noted above, to examine the robustness of our findings, several sensitivity analyses were conducted. All sensitivity analyses had results similar to those of the primary analyses in terms of levels of significance and effect size. Therefore, only the results from the primary analyses are included here.

Table 2.2. Bivariable and multivariable associations for depression based on social media use, personality traits, and sociodemographic variables

	AOR for Depression (95% CI)^a				
	Model 1	Model 2	Model 3	Model 4	Model 5
	Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism
SMU^b					
Q1 (0-120)	ref	ref	ref	ref	ref
Q2 (121-195)	1.35 (0.69, 2.63)	1.32 (0.68, 2.58)	1.35 (0.69, 2.63)	1.37 (0.70, 2.68)	1.28 (0.66, 2.52)
Q3 (196-300)	2.22 (1.18, 4.17)	2.18 (1.16, 4.10)	2.22 (1.18, 4.18)	2.28 (1.21, 4.30)	2.13 (1.12, 4.02)
Q4 (≥301)	3.25 (1.67, 6.34)	3.11 (1.59, 6.06)	3.25 (1.67, 6.34)	3.35 (1.72, 6.54)	3.01 (1.54, 5.89)
Personality Trait	0.97 (0.63, 1.51)	0.71 (0.45, 1.13)	0.99 (0.62, 1.58)	0.51 (0.33, 0.80)	2.46 (1.57, 3.87)
Age, y					
18-20	1.89 (0.74, 4.84)	1.92 (0.75, 4.91)	1.89 (0.74, 4.84)	1.93 (0.75, 4.97)	2.00 (0.77, 5.17)
21-24	1.12 (0.60, 2.09)	1.08 (0.58, 2.02)	1.12 (0.60, 2.09)	1.06 (0.57, 1.99)	1.05 (0.56, 1.98)
25-30	ref	ref	ref	ref	ref
Sex					
Female	1.04 (0.67, 1.63)	1.09 (0.70, 1.72)	1.04 (0.67, 1.63)	1.11 (0.71, 1.75)	0.90 (0.57, 1.42)
Male	ref	ref	ref	ref	ref
Race					
White, non-Hispanic	ref	ref	ref	ref	ref
Black, non-Hispanic	0.98 (0.40, 2.41)	0.97 (0.39, 2.39)	0.98 (0.40, 2.41)	1.03 (0.41, 2.54)	1.17 (0.47, 2.92)
Hispanic/Latino	1.13 (0.59, 2.15)	1.14 (0.60, 2.17)	1.13 (0.59, 2.15)	1.20 (0.63, 2.28)	1.12 (0.59, 2.14)
Asian	1.43 (0.73, 2.82)	1.40 (0.71, 2.75)	1.43 (0.73, 2.82)	1.45 (0.73, 2.86)	1.54 (0.77, 3.06)
Other ^c	1.00 (0.12, 8.27)	0.95 (0.11, 7.95)	0.99 (0.12, 8.20)	1.07 (0.13, 8.95)	1.20 (0.14, 10.07)
Annual Household Income					
Less than \$25,000	ref	ref	ref	ref	ref
\$25,000-\$50,000	0.82 (0.41, 1.64)	0.83 (0.41, 1.65)	0.82 (0.41, 1.63)	0.83 (0.42, 1.67)	0.88 (0.44, 1.78)
\$50,000-\$75,000	0.95 (0.47, 1.91)	1.00 (0.49, 2.03)	0.94 (0.47, 1.91)	0.95 (0.47, 1.92)	1.04 (0.51, 2.12)
≥\$75,000	0.70 (0.35, 1.40)	0.75 (0.37, 1.50)	0.70 (0.35, 1.40)	0.69 (0.35, 1.39)	0.72 (0.36, 1.44)

Note: Statistical significance (p<0.05) appears in boldface.

Abbreviations: AOR = adjusted odds ratio; CI = confidence interval.

^a Development of depression was measured using the 9-item Patient Health Questionnaire (PHQ-9) using a previously-validated cut off of 10. This variable represents the development of depression over 6 months, with non-depressed participants at baseline. Analyses controlled for sociodemographic variables represented within the model.

^b Social media use (SMU) includes self-reported data and was divided into quartiles (Q1-Q4) based upon time (in minutes) per day.

^c American Indian/Native Alaskan, Native Hawaiian/Pacific Islander, and multiracial represent the other race category. Due to the very small sample size for each of these race categories, separating them was not necessary for the purpose of this analysis.

4. Discussion

In a large representative sample of young adults, we found that neuroticism was associated with development of depression and agreeableness was associated with a lower risk of developing depression. However, there were no associations between the other three personality traits (openness, conscientiousness, and extraversion) and development of depression. We also found that increased SMU was associated with development of depression in each model that focused on one of the personality characteristics. Finally, interaction terms between SMU and personality characteristics were nonsignificant.

The fact that neuroticism was associated with a higher risk of developing depression supported **H1a**. This finding is consistent with prior studies that describe neuroticism as a strong predictor of depression (Kotov et al., 2010; Noteboom et al., 2016), and being associated with decreased life satisfaction and decreased positive affect (Jensen et al., 2020). It is useful to know that these relationships seem to be borne out in the longitudinal setting. Because these

relationships are well established at this point, it would be useful for public health practitioners to determine whether this knowledge can lead to meaningful improvements in identifying and treating individuals with depression.

Although we expected conscientiousness and extraversion to be associated with lower development of depression based on prior research (Kotov et al., 2010), we did not find this to be the case, contradicting **H1b and H1d**. One reason for this difference may be that most prior studies have been cross-sectional in nature, while the current study examined a different outcome—development of depression over the subsequent 6 months instead of simple co-occurring depression. Thus, it may be that conscientiousness and extraversion are indeed associated with a lower risk of co-morbid depression in the cross sectional setting but that it does not protect against depression over the subsequent 6 months. Future longitudinal work would be useful to confirm these findings and to determine if conscientiousness and extraversion protects against development of depression in different time frames, such as 1 year.

The fact that agreeableness was associated with a lower risk of developing depression contradicted **H1c**. Agreeable individuals tend to be more pro-social and to have increased empathy and concern for others (Finley et al., 2017). Thus, it could be that these individuals sustain more positive relationships over time that contribute to lower risk of depression. Interestingly, prior research has been mixed with regard to whether there is an association between agreeableness and depression (Bienvenu et al., 2004; Kotov et al., 2010; Naragon-Gainey and Simms, 2017). However, most work in the past has been cross-sectional. Therefore, it may be of particular interest that, empirically, higher agreeableness is related to lower subsequent development of depression in a longitudinal setting. It would be valuable for future

work to examine these factors qualitatively, because there is little high-quality qualitative work in this area.

There was no association between openness and development of depression, supporting hypothesis **H1e**. This result was consistent with most prior work, which has suggested little association between openness and depression (Kotov et al., 2010). However, some prior research suggests that high openness has been associated with higher likelihood of having depression (Bienvenu et al., 2004). Thus, clarification of associations with future examinations may be particularly useful for this characteristic.

The fact that social media was strongly associated with the development of depression regardless of personality characteristics is consistent with prior studies finding SMU to be associated with development of depression (Primack et al., 2021). This finding extends prior research because assessments using interaction terms showed that associations between SMU and development of depression did not vary according to any of the 5 personality characteristics. This finding contradicted **H2b**, which had been based on a prior finding that increases in SMU *were* associated with social isolation for low levels of conscientiousness but *not* associated with high conscientiousness (Whaite et al., 2018).

This difference may reflect the fact that **H2b** was generated based on a cross-sectional study (Whaite et al., 2018), while the current study examined development of depression over 6 months. This difference may lead to different clinical recommendations. For example, based on the prior study, clinicians may have suggested to patients with high conscientiousness that they may not need to worry about use of increased social media being related to development of depression. Because we did not find these same relationships in the longitudinal setting, clinicians may wish to suggest that SMU may be a risk factor for development of depression

regardless of personality characteristics. However, it will still be useful for future research to examine these relationships for different lengths of follow-up.

As expected, the association between SMU and development of depression did not differ across neuroticism, agreeableness, extraversion, and openness (**H2a**, **H2c**, **H2d**, and **H2e**). While this is consistent with prior research, it is still a useful finding, because it suggests that SMU as an exposure may be useful to consider regardless of underlying personality structure. For example, because neuroticism has been associated with the development of depression, in prior studies and in the current study (**H1a**), it may be tempting to conclude that people with low neuroticism may not be at risk for development of depression, even if they have high social media exposure. However, because there was not a significant interaction term between social media and neuroticism, the association between social media exposure and development of depression seems to be consistent regardless of level of neuroticism.

In some ways, these findings may make intervention easier, because they suggest that intervention would be useful broadly. However, future research is still needed to confirm these associations and further understand the development of personality and depression across the lifespan. Therefore, it would be valuable for additional research to examine key contextual variables related to social media, including different social media sources, differing frequency of social media use, reasons for using social media (e.g., to obtain specific information vs. for no specific purpose), and social media content. Interventions could then be developed that focus on improving quality of relationships, shared meanings, and to help eliminate miscommunications or misperceptions that may vary by personality trait and use of social media.

5. Limitations

We assessed personality using only the Five-Factor Model. While this is an accepted assessment of personality, it may be useful in future work to use complementary personality measurements. It is also a limitation that we measured social media by self-report using surveys. It would be useful for future work to use more in-depth measurement of SMU, such as with automatic downloads of usage data.

For this initial assessment of interrelationships among social media use, personality traits, and development of depression, it was part of our *a priori* protocol to operationalize variables as categorical and dichotomous based on prior work, and it would be useful for future research to examine these variables in a finer-grained manner. For example, while the focus of the current analysis was to examine development of depression according to an established cut-off for the PHQ-9, resulting in a dichotomous variable, it may be useful for future work to examine more nuanced outcomes such as the magnitude of depression. Similarly, we established an *a priori* cut-off of 7 or above (on a scale of 2-10) to operationalize personality traits. However, now that these initial analyses have been completed, it would be useful for future research to include continuous and/or ordered categorical operationalization of personality variables to more deeply explore associations among personality variables, social media use, and depression. Longer and more intensive assessments of personality would also be useful.

It is also worth noting that the exposure focused on overall SMU rather than a more nuanced assessment of specific activities on social media. This was an unavoidable part of our protocol, because the questionnaire assessed overall SMU rather than asking for specific time spent on each of the different platforms. We made this decision explicitly, because in pilot studies participants had difficulty accurately assessing individual platform use, while overall use

was easier for participants to estimate. However, it would be valuable in future work to improve measurement according to specific platforms.

Finally, because the sample included only young adults ages 18-30, inferences cannot be made for other age groups.

6. Conclusion

This study used longitudinal data to investigate the associations between SMU, personality, and development of depression in young adulthood. Findings suggest that neuroticism was associated with a higher risk of developing depression and agreeableness was associated with a lower risk of developing depression. Strong and linear associations of SMU across personality characteristics suggests that future interventions should focus on reduction of SMU regardless of personality type.

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Chapter III

Associations between social media emotional support, anxiety, and personality in young adulthood

Abstract

Background: Longitudinal studies demonstrate meaningful links between social media use and anxiety. However, the mechanisms of this association are not completely understood. We aimed to fill this gap in the literature by assessing associations between social media emotional support, personality structure, and anxiety.

Methods: Data were obtained from a national sample of 2,403 individuals ages 18-30. Primary measures included the 10-item Big Five Inventory (BFI-10) assessing personality, the 4-item Patient-Reported Outcome Measurement Information System (PROMIS) scale assessing anxiety, and self-reported data pertaining to social media emotional support (SMES), age, and gender. Factorial analysis of variance (ANOVA) and multiple regression analyses were used to examine the effects and associations while controlling for age and gender.

Results: Social media emotional support was associated with decreased anxiety and was more pronounced among females. Our findings also reveal that the personality traits high openness, extraversion, agreeableness, and low conscientiousness were associated with increased SMES. However, there were no significant differences in neuroticism ($F(1, 2,399) = 0.35, p = 0.55$).

Limitations: Due to the cross-sectional research design and self-reported survey data, directionality could not be determined.

Conclusions: These findings suggest that there may be a link between social media emotional support and reduced anxiety, especially among females. Social media emotional support may

also be linked to specific personality traits. Future research should investigate these associations longitudinally.

1. Introduction

Anxiety is the second leading cause of disability (Whiteford et al., 2013) and mortality (Walker et al., 2015) worldwide. About 31% of adults in the U.S. will experience an anxiety disorder within their lifetime (Harvard Medical School, 2007) and median age of onset is 17 years (Solmi et al., 2022). Anxiety increases the risk for multiple other mental health conditions, including depression (Parker et al., 1999) and suicide (Lew, 2019). It has also been linked to numerous social, biological, and environmental factors, including stress-induced inflammation and mechanisms of the gut microbiome (Peirce and Alviña, 2019), sleep disruption (Chellappa and Aeschbach, 2022), migraine headaches (Peres et al., 2017), negative workplace culture (Rasool et al., 2020), maladaptive perfectionism and low self-esteem (Doyle and Catling, 2022). It also impacts academic performance (Barbosa-Camacho et al., 2022) and is associated with negative post-event rumination (Kashdan and Roberts, 2007). Therefore, further investigating the effects of this condition would be valuable due to its increased prevalence in young adulthood (Goodwin et al., 2020).

Recently, studies have connected anxiety with social media use. Time spent on social media has been significantly associated with anxiety when using more social media daily (Vannucci, Flannery, and Ohannessian, 2017). Problematic social media use (i.e., similar to patterns of addiction) was significantly associated with increases in social media social support and mental health “depression, anxiety, and social isolation” (Meshi and Ellithorpe, 2021). Specific patterns of social media use has also been a contributing factor. For example, Shensa et

al. (2018) found that high levels of social media use, problematic use, and emotional connection to the platform was associated with elevated anxiety and depression symptoms. Due to differences in how social support is received and perceived on social media platforms, it remains unclear how social media emotional support may be associated with anxiety.

Social support has been identified as a protective factor for both mental and physical health (Taylor, 2011; Thoits, 2011). Furthermore, receiving higher levels of social support has also been associated with improved mental health (Milner, Krnjacki, and LaMontagne, 2016) and lower levels for anxiety and depression (Zimet, 1988). Emotional support is a type of social interaction between individuals that focuses on caring and showing concern for one another through verbal and nonverbal processes (American Psychiatric Association, 2022). Social support is influenced by numerous factors, including heritability (Kessler et al., 1992). Therefore, it is critical to have a comprehensive understanding of social media emotional support on human behavior.

In fact, studies have connected type of emotional support with specific mental health conditions. Social media emotional support was associated with an increased risk for developing depression, with face-to-face emotional support having a lower risk (Shensa et al., 2020). Increased risk of anxiety and depression have also been linked with social isolation, and social support has been described as reducing the negative health risk (Evans and Fisher, 2022).

Although there are numerous factors that influence the risk of developing numerous mental health conditions and ways social and emotional support is received, how people use social media and receive emotional support may vary by personality type. High neuroticism has been found to be a main predictor for anxiety in past studies (Abdel et al., 2013; Brandes and Bienvenu, 2006). Other personality traits strongly related to anxiety disorders include those with

low extraversion and Cluster C disorder traits (Brandes and Bienvenu, 2006). Pentina and Zhang (2017) found that positive emotions on Facebook, including social support from friends, are related to the personality traits: extraversion, agreeableness, and conscientiousness. Furthermore, belonging and self-presentation on social media may affect specific personality traits more than others. A study using Facebook looked at these associations and found unique social media behaviors. Among the study findings, the tendency to express the true self was identified with the personality traits: neuroticism, agreeableness, and extraversion, with neuroticism also involving disclosing hidden aspects of the self (Seidman, 2013). Using social media on a diverse set of platforms has also been linked with specific personality traits: neuroticism, extraversion, and openness (Vaid and Harari, 2021), respectively.

Whaite et al. (2018) explored the associations of social media use, personality, and social isolation and found that people with low conscientiousness had an increased perception of social isolation when using more social media. Personality is unique for each individual. Therefore, personality may contribute to the type of emotional support that is received (i.e., positive or negative emotional support), which may help identify increased risk for the development of various mental and physical health problems.

There are numerous reasons why emotional support, personal identity, and anxiety are connected in our ever-advancing public health infrastructure. For example, various forms of neurotechnology and devices, therapeutics, diseases, and traumatic events may alter personal identity and character traits (Jotterand & Giordano, 2012). Due to the long-term effects and integration being unknown, it is unclear how social media may be used and impact valuable personal support, expression, and health. How individuals perceive messages and cope with their own feelings (that may be changing due to varying degrees of exposure) are likely to be a

contributing factor to specific public health outcomes and how social media will be used in general.

While studies have found meaningful links with social media and mental health (Merrill et al., 2022; Primack et al., 2021), to our knowledge, no study has examined the *associations of social media emotional support, personality structure, and anxiety* using a national sample of young adults. Understanding these differences can help tailor interventions with efforts of increasing perceived emotional support, which can then in-turn improve overall wellbeing. Therefore, the study aims were to: (1) determine if there is a link between social media emotional support and anxiety; and (2) assess if the association is different for personality structure.

Based on related prior research (Shensa et al., 2018; Shensa et al., 2020), we hypothesized that social media emotional support would be associated with elevated anxiety (Hypothesis 1a). Because prior research has found that social support is a protective factor for both mental and physical health (Taylor, 2011; Thoits, 2011) and for this behavior to likely mirror onto social media platforms, we expect using more social media in minutes would be associated with increased perceived social media emotional support (Hypothesis 1b). In terms of personality, based on prior related research (Seidman, 2013; Whaite, 218; Vaid and Harari, 2021), we expected increased social media emotional support to be associated with extraversion (Hypothesis 2a), agreeableness (Hypothesis 2b), neuroticism (Hypothesis 2c), openness (Hypothesis 2d), and low conscientiousness (Hypothesis 2e).

2. Method

Study Sample

Participants were recruited using Qualtrics Sampling Services between March and September in 2018. Qualtrics specializes in survey data, partnering with web-based panel providers to obtain a diverse group of respondents (Ibarra et al., 2018). A “balanced start” methodology that represented the U.S. population in terms of various factors (e.g., sex, age, and race) was used within the recruitment process. Inclusion criteria for the study included being 18-30 years old, read English, and submit responses using a digital interface. The University of Pittsburgh Institutional Review Board approved the study and informed consent was provided. Gift cards were given to compensate study participants for their time. The final sample was comprised of 2,403 individuals with complete responses. 68.2% were White, 7.6% Black, 14.4% Hispanic, and 8.4% Asian. Gender was approximately equal, with 50.8% being female.

Measures

Anxiety. The Patient Reported Outcomes Measurement Information System (PROMIS) four-item anxiety scale has been validated as an appropriate measure for screening patients with chronic pain (Kroenke et al., 2014) and this was used to evaluate anxiety. The 4-item questionnaire asked participants about their feelings of fear, threat, and stress (Dean, 2016) that had occurred in the past 7 days (Pilkonis et al., 2011). Each question followed a Likert-type scale of 1-5 (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always). The sum of the four items was then created as a composite score. Final measurement had a range of 4-20, with higher scores indicating more severe anxiety symptoms (Cella et al., 2019).

Social Media Emotional Support. Social media emotional support (SMES) was measured using a validated scale from previous research (Shensa et al., 2020). Four questions

pertaining to social media emotional support were administered to participants, such as “I have people on social media to listen to me when I need to talk.” Each question followed a Likert-type scale of 1-5 (1 = never, 2 = rarely, 3 = sometimes, 4 = usually, 5 = always). The sum of the four items was then created as a composite score. Final measurement had a range of 4-20, with higher scores indicating greater levels of SMES.

Personality. The 10-item Big Five Inventory (BFI-10) was used to evaluate personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism) (Gosling, Rentfrow, and Swann, 2003). Participants responded to 2 items for each of the five personality traits about how they were related to specific personality characteristics on a 0-5 scale (0 = strongly disagree, 5 = strongly agree). A previously-validated cut point of 7 was used to identify each personality trait as either yes (at or above 7) or no (below 6) (Merrill, Cao, and Primack, 2022).

Gender. Participants self-reported their sex as either female (1) or male (2).

Age. The developmental implications of public health were used to categorize self-reported age as 18-20, 21-24, and 25-30.

Data Analysis - ANOVA

Factorial analysis of variance (ANOVA) was used to examine the interaction effect of personality and gender on social media emotional support. Pairwise contrasts were examined for each personality trait on social media emotional support. A significance level (α) of 0.05 was used for all statistical tests and data was analyzed using SAS/STAT software, Version 9.4 (TS1M4) of the SAS System for Windows. Copyright © 2002-2012 SAS Institute Inc. SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc., Cary, NC, USA.

3. ANOVA Results

To analyze the effect of each personality trait and gender on SMES, a series of five, two-way factorial ANOVA's were performed. The interaction between openness and gender was not statistically significant ($F(1, 2,399) = 0.08, p = 0.78$). The main effect of openness ($F(1, 2,399) = 4.69, p = 0.03$) and the main effect of gender ($F(1, 2,399) = 8.26, p < 0.01$) was statistically significant. The interaction between conscientiousness and gender was not statistically significant ($F(1, 2,399) = 1.48, p = 0.22$). The main effect of conscientiousness was statistically significant ($F(1, 2,399) = 9.19, p < 0.01$). Similarly, the interaction between extraversion and gender was not statistically significant ($F(1, 2,399) = 2.61, p = 0.11$). The main effect of extraversion was statistically significant ($F(1, 2,399) = 20.72, p < 0.01$). The interaction between agreeableness and gender was not statistically significant ($F(1, 2,399) = 0.70, p = 0.40$), but the main effect of agreeableness was statistically significant ($F(1, 2,399) = 18.73, p < 0.01$). Regarding neuroticism, the interaction between neuroticism and gender was close to, but not statistically significant ($F(1, 2,399) = 3.53, p = 0.07$), and the main effect of neuroticism was not statistically significant ($F(1, 2,399) = 0.35, p = 0.55$).

In summation, the interaction between each personality trait and gender was not statistically significant. All the main effects of each personality trait except for neuroticism were statistically significant. Therefore, there was a difference between the participants' perception of SMES based on their personality trait except for neuroticism. The pairwise comparison of SMES based on personality and gender is presented in **Table 3.1**. Participants who are more open, less conscientious, more extraverted, more agreeable, and female tend to report higher SMES.

Assumptions of ANOVA analyses were also examined before any interpretations were made. In terms of normality, the univariate statistics of SMES was run and the results suggested

that the skewness and kurtosis both fell within the range of -1 and 1, indicating normality of the dependent variable. The homogeneity of variance assumption test had p values greater than .05, suggesting group variances and group sizes were homogeneous. In terms of independence, the participants were randomly selected, and they were all independent. Therefore, all the assumptions of ANOVA were met, and the results were trustworthy.

Table 3.1. Means and standard deviations of social media emotional support based on personality trait and gender from sample (N = 2,403)

Study Variables	SMES (Mean)	SMES (SD)
Personality Trait		
Openness		
Yes	10.58	4.74
No	10.17	4.74
Conscientiousness		
Yes	10.16	4.73
No	10.78	4.75
Extraversion		
Yes	11.01	4.72
No	10.07	4.73
Agreeableness		
Yes	10.73	4.84
No	9.89	4.56
Neuroticism		
Yes	10.44	4.56
No	10.32	4.85
Gender		
Female	10.64	4.68
Male	10.09	4.79

Data Analysis – Multiple Regression

To examine the relationship between SMES, frequency of social media use, anxiety, gender, and age, a multiple regression analysis with SMES as the dependent variable, and the other variables as independent predictors was conducted. Also, the interaction between anxiety

and gender, and the interaction between anxiety and age, were included in the model (see **Table 3.2**).

Multiple Regression Results

The ANOVA test of the model yielded a F statistic of 36.98 with a p value $<.001$, suggesting that the regression model was significant. The R squared was 0.09, indicating that 9% of the variability in SMES could be explained by the predictors.

Anxiety and social media emotional support was not significant ($p = 0.58$) when the interaction term was included in the model. The increase of social media time in minutes was associated with higher SMES scores ($p = <.001$). Being female was associated with an increase in SMES ($p = .01$). Younger people reported higher SMES, with one year increase in age being associated with 0.19 unit decrease in SMES ($p = .01$).

The regression coefficients as shown in Table 3.2 suggest that the interaction of anxiety and gender was statistically significant at an alpha level of .05. The interaction coefficient for anxiety and gender was -0.12, and the main effect of anxiety was -0.13. Therefore, for males, the main effect of anxiety was -0.13, while that for females was -0.25. This implied that for males, one unit increase in anxiety score was associated with 0.13 unit decrease in SMES, whereas for females, one unit increase in anxiety score was associated with 0.25 unit decrease in SMES. In other words, the effect of anxiety on SMES was more pronounced for females. The interaction coefficient for anxiety and age was not significant ($p = .14$).

Table 3.2. Regression coefficients: The predictors and interaction terms of SMES (N = 2,403)

Independent Variables	beta	t	p-value
Anxiety	-0.13	-0.55	0.58
Social Media (in minutes)	0.001	10.81	<.001
Female	1.13	2.67	0.01
Age	-0.19	-2.6	0.01
Anxiety*Gender	-0.12	-2.39	0.02
Anxiety*Age	0.01	1.49	0.14

4. Discussion

Among a large national sample of young adults, we found that anxiety was strongly associated with a decrease in perceived social media emotional support and the effect was more pronounced among females. Although this contradicted H1a, it could be explained by the fact that as mental health declines, it can impact body, mind, and spirit, and altogether, would impact actions such as valuable social support. However, we also know that expressing emotion is an important coping mechanism. In fact, Gomes et al. (2022) found that individuals who suppress their emotions report higher distress levels and having higher suppression of emotions when less social support is perceived. This may indicate that people with higher levels of anxiety are more vulnerable to negative effect due to the suppression of emotion. Social support has also been linked with age and gender in the past. Milner et al. (2016) found that higher levels of social support were among people under the age of 30 years old. Additionally, higher levels of social

support appeared to slightly benefit females more than males when measuring their overall mental health.

As expected, time using social media was associated with higher SMES scores and this was predominantly seen among the younger age participants, supporting H1b. The fact that younger generations have grown up with technology may impact how social support is perceived, becoming normalized. These results show similar patterns to a recent longitudinal study that explored the associations personality type, social media use, and development of depression (Merrill et al., 2022). It may be that people are showing a preference to use social media to obtain emotional support, communicate their feelings, and stay connected within their social networks during a time of technology transition and expansion.

Although we expected extraversion, agreeableness, neuroticism, openness and those with low conscientiousness (H2a, H2b, H2c, H2d, and H2e) to have increased SMES, the hypotheses held true for all traits except for neuroticism, contradicting H2c. One reason for this difference could be the impact of varying degrees of human biological exposures and traumas that can result in varying levels and changes in personality and character traits (Jotterand & Giordano, 2012).

Additionally, those who are more neurotic may perceive content on social media platforms negatively, with complicated relationships (e.g., romantic relationships - Asselmann and Specht, 2023), feelings of emotional burden, and personal inadequacy impacting how SMES is sent and received in its various forms. Therefore, support may not be instigated within one's social network and this could increase the risk for developing various mental health problems, such as anxiety.

Though intervention can be improved with new research, future work can enhance findings by focusing efforts of integrating both the technological and biological factors about personality, identity, and health outcomes to better understand its impact on humans and the environments in which they reside. Furthermore, online communication and society has changed drastically after the presence of the COVID-19 pandemic. It will be vital for public health professionals to create ways to improve well-being, especially among those who are sensitive to change. Improving perceptions, communication, feelings, and finding happiness is integral for achieving quality of life across the lifespan.

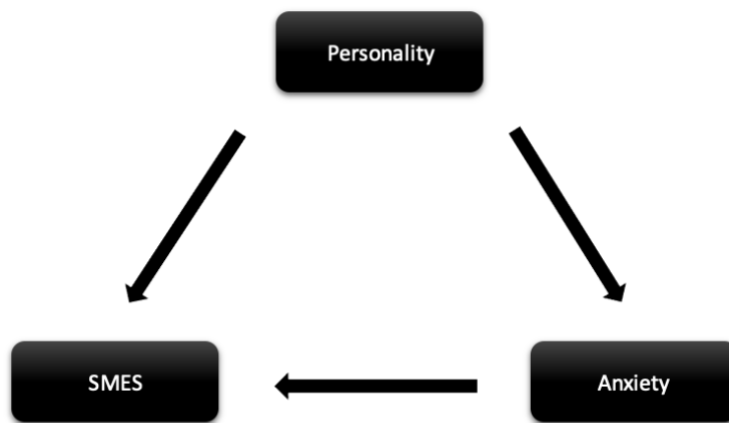


Figure 3.1. Social media emotional support, personality, and anxiety

5. Limitations

Several limitations warrant consideration. First, the study was cross-sectional and used self-reported survey data, therefore, directionality cannot be determined. Second, we assessed anxiety using only the 4-item anxiety scale. While this has been a validated measurement for

severity of symptoms, it may be useful for future research to follow up with varying levels of anxiety across time. Finally, a national sample of adults ages 18 to 30 were used for our sample; therefore, results cannot be generalized to children, adolescents, or adults above 30. It would be valuable for future studies to explore these associations across important lifespan milestones, due to these reasons.

6. Conclusion

This cross-sectional study used a national sample of young adults in the U.S. Findings suggest that social media emotional support may be a protective factor against anxiety, especially for females. Using more social media in minutes and specific trait characteristics may be linked to an increase in perceived emotional support. It would be valuable for future research to further explore these associations using longitudinal data utilizing a mixed-method research design.

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Chapter IV

Social media and mental health: an application of Stone's causal stories framework

Abstract

Background:

While prior studies have applied Stone's causal stories framework to numerous policy problems, no study has used the framework to analyze the relationship between social media use and mental health.

Research Design:

Directed content analysis is used to collect and analyze data from sixty-six liberal and conservative newspaper sources in the United States between 2018 and 2023. Articles are analyzed for content related to social media, mental health, and policy. Proponents and opponents for greater government regulation are identified using Stone's typology (accidental cause, intentional cause, mechanical cause, and inadvertent cause).

Results:

Analysis of newspaper articles reveals a construction of competing stories that describe the "causes" of negative mental health outcomes in young people using social media. Competing causal narratives involve defining the nature of the impact social media has on young people using an intentional/complex causal narrative on one side of the debate and an inadvertent/complex causal narrative on the other.

Conclusions:

Proponents of government regulation framed Big Tech accountability as a solution. Opponents framed concerns made by Big Tech executives, health professionals and researchers, lobbyists,

interest groups, and social media users to demonstrate a lack of need for increasing government regulation on social media platforms and as a strategy to stall action. Although the study confirms elements of Stone's causal stories framework, such as the process of using a combination of strong and weak positions; The model is limited by missing influences of government agencies, leadership, and funding mechanisms. These components would offer further insight to policy processes, as demonstrated in the analysis from this study.

1. Introduction

Scholarly research finds that there is a relationship between social media use and depression among young adults (Primack et al., 2021; Merrill, Cao, and Primack, 2022). Furthermore, the negative mental health impacts of social media use by young teens-adults, such as body image, depression, and suicide, is receiving greater attention in the media (Horwitz, 2021), suggesting that the problem is on both the systemic and government agenda (Kingdon, 1984). Despite the scholarly findings and increased media attention, the U.S. government has done little to address the problem. The issue has recently been debated in the public sphere and involved multiple agendas. Regulatory efforts have been limited.

The provisions in the internal documents from Facebook lead to various state actors holding hearings and this resulted in intense reactions from big tech companies, parents, and political actors in the U.S. and globally. The ongoing discussion has become complex involving parent responsibility and big tech accountability. The government has become increasingly aware of the impact social media has on young users and is making decisions to combat the growing problem.

This article explores the arguments for and against increased government intervention on social media platforms using a combination of liberal and conservative newspaper sources. Deborah Stone's causal stories framework is employed to analyze data from these sources to help understand how specific language had been used in discussions about social media use and mental health. Prior research has applied Stone's causal stories framework to numerous policy problems, such as teacher reform (Harrison and Cohen-Vogel, 2012), indoor environmental carcinogens (Scheberle, 1994), and contemporary land and resource management (Angstadt, 2020), to name a few. However, no study has applied the framework to the relationship between social media use and mental health. In addition to adding a new policy problem/issue to the policy literature, this research will provide insights to policymakers and other stakeholders. Specifically, findings from this study will allow for an improved understanding about how specific language is used to assign blame, responsibility, and accountability in social media and mental health narratives. Understanding how language is used by stakeholders can provide guidance to those who design public policies that focus on social media.

The Application of Causal Stories in the Era of Social Media

Stone (1989) contends that an important component of policy agendas is how conditions in politics become defined as a problem. "Problem definition is a process of image making, where the images have to do fundamentally with attributing cause, blame, and responsibility" (Stone, 1989, p. 282). Causal stories have also been used to influence specific types of policy solutions. For example, health-oriented frames in pressure group narratives that focused on the opioid crisis were effective but limited (El-Sabawi, 2019). Causal stories focus on situations and how they occur by the actions of humans and are amenable to interventions (Stone, 1989). Her framework is broad in nature and offers insight to a policy process that tends to be systematic.

There are four types of causal stories that focus on causality (accidental cause, intentional cause, mechanical cause, and inadvertent cause) the complexity of which can be used as a strategy to prevent blame or reform (Stone, 1989). There are also two dimensions within each narrative, an empirical and moral dimension. “On both levels, causal stories move situations intellectually from the realm of fate to the realm of human agency” (Stone, 1989, p. 283). The first two are strong positions (accidental and intentional causes) and the last two are relatively weak positions (mechanical and inadvertent causes) that are used in combination when struggling to achieve problem definition. Accidental causes are in “the realm of accident and fate” (Stone, 1989, p. 284). She describes politics focusing their attention on moving a situation away from this cause to one within the realm of human control due to the limitations that exist. Intentional causes involve the willful actions by humans leading to consequences that resulted from their initial behaviors. When the consequences of the actions are “perceived as good,” it is seen as rational; when “perceived as bad,” the stories focus on the “oppressors and victims” (Stone, 1989, p. 285). Mechanical causes “are designed, programmed, or trained by humans to produce certain consequences (Stone, 1989, p. 286). For example, manufacturers design various products to deteriorate with the notion that consumers will purchase new products in the near future. And lastly, inadvertent causes are described as the consequences being “predictable by experts, but unappreciated by those taking the actions” (Stone, 1989, p. 286). Stone provides an example of those with an illness may not have had the knowledge that overeating contributes to health conditions, such as diabetes or cardiovascular disease.

Narratives may also be described as complex, and these go beyond the model proposed by Stone due to the social processes involved in social systems. For example, state-level policy narratives may differ and influence policy development and implementation in various ways

(Mintrom and O'Connor, 2020), and this possibility must be considered when exploring causal narratives in various settings. Policy termination has also been studied using Stone emphasizing successful government action when using its own political resources (Frantz, 2002). The authors found that there were specific strategies that were successful for terminating policy at the National Hansen's Disease Center. These strategies involved articulating the goals in a skillful manner, describing the problems carefully, and offering a variety of valuable solutions to government (Frantz, 2002).

Ethical concerns may also be present in policy narratives, such as omitting details, lacking scientific evidence, and other biases (Fadlallah et al., 2019). A systematic review was conducted to determine how the use of narratives impact the process of health policy-making. The study found the evidence of its impact was of "very low certainty" (Fadlallah et al., 2019, p. 19). Additionally, though narratives may positively influence change in health policy, undesirable outcomes can occur. "For example, the case of childhood cancer where optimistic 'cure' or 'hope' stories were selectively used that ignored the negative realities" (Fadlallah et al., 2019, p. 19).

We can expect narratives similar to health policies that focus on childhood cancer (as described above) to be comparable to the era of social media and its emerging problems. The first social networking site "Six Degrees" was launched in 1997 and then evolved from there (Read, 2015). Research during that time found significant associations between increased internet usage and depression (Kraut et al., 1998), with limited media coverage. Furthermore, the scientific literature has grown significantly along with the number of platforms and user base. If any problems occurred among social media users in the past and were otherwise ignored, the issues have likely grown to a level that warrant consideration and action. In fact, previous

research examining the relationship between social media use and mental health among young adults has found that using multiple social media platforms is associated with symptoms of depression (Vannucci, Flannery, and Ohannessian, 2017) and anxiety (Primack, Shensa, Escobar-Viera, et al., 2017). Using more social media has also been linked to feeling more socially isolated and feeling socially isolated contributes to depressive symptoms (Primack, Shensa, Sidani, et al., 2017). Furthermore, depressive symptoms in young adulthood have been linked with media use during adolescence (Primack et al., 2009). The fact that having depression may impact behavior by focusing on negative communications, perceptions, and actions (Primack et al., 2018) adds to the importance of the issue involving social media use and mental health among young users. It may be that government is seeing a policy window of opportunity (Kingdon, 1984) to change digital settings by promoting policies that protect children and young people.

2. Research Design

Data, Methods, and Analysis

Text data has been used in prior research to provide estimates of the policy position of various actors (Izumi and Medeiros, 2021). “This kind of data and methods is fundamental for political scientists because written and spoken words are the main way that political conflict is not only expressed, but also built” (Izumi and Medeiros, 2021, p. 158). The current study uses directed content analysis (Hsieh and Shannon, 2005) to analyze data from selected newspaper sources between 2018 to 2023. Directed content analysis uses a theoretical framework to research phenomenon to further knowledge and/or validate prior theory (Hsieh and Shannon, 2005). We select 2018 as the beginning year of analysis due to two important published studies

in 2018 making particularly strong cases for a causal relationship (i.e., measurable effects were demonstrated by the amount of social media use and impact on overall mental health) (Walton, 2018). Prior to 2018, most studies of social media use and mental health among young adults demonstrated correlation, not causation. The first study to make a strong case for causation indicates that limiting social media to 30 minutes daily can significantly improve wellbeing (Hunt et al., 2018). The second study found that young adult women engaging with peers on social media who were perceived to be more attractive than themselves increased negative body image (Hogue and Mills, 2019).

Proponents and opponents of greater government regulation were identified using newspaper articles that covered discussions about state and federal legislation. Two liberal and two conservative newspaper sources were used to identify and evaluate causal stories and narratives relating to social media and mental health. The sources were retrieved from an extensive reference list of political positions from newspapers published by Boston University Libraries. Due to the subjective nature of these labels, the sources used in this analysis may be limited (Boston University, 2022). The liberal sources used in the analysis were *The New York Times* and *Washington Post* and the conservative sources were *The Wall Street Journal* and *Chicago Tribune* (Boston University, 2022). We chose these sources due to their overall impact and consumer base. Reaching a broad audience would affect how the narratives are portrayed and how the public responds; allowing us to analyze the content from multiple perspectives. Newspaper articles published between 2018 and 2023 were retrieved using US Newsstream and Nexis Uni. The following search terms were used to locate specific articles that pertain to the topic: “social media,” “mental health,” and “policy.” We read the article abstracts and included those that described social media and mental health impacts in users ages 12 to 30 and focused

on the phenomenon occurring in the U.S. A total of 109 articles were retrieved. The articles were then carefully reviewed for specific inclusion criteria for each of the primary search terms. For example, a source would only be included if it related to at least one criterion from each search term. Social media included any of the top 10 social media platforms in 2018 (i.e., Facebook, YouTube, Instagram, Snapchat, WhatsApp, Twitter, Pinterest, Reddit, LinkedIn, and Tumblr). After the initial review, we decided to generalize the search term due to articles describing newer platforms (e.g., Meta, TikTok, Discord, and Telegraph, to name a few). Mental health involved well-being, depression, anxiety, suicide, loneliness, addiction, or eating disorders. And lastly, policy included legislation, bill, regulation, solution, government, oversight, or lawsuit. If a newspaper article met the criteria detailed above, the article was documented into a table with the following details: title, source, and year of publication. A final total of 66 articles met the criteria and was included for data analysis (**see Table 4.1**).

Each article was then (1.) organized by year and analyzed for content related to Stone's (1989) typology and (2.) reviewed further for possible subcategories. Specifically, the empirical and moral dimensions of Stone's causal stories framework were used as priori codes. Descriptions of the relationship between social media use and mental health that characterize the process as *guided* or *unguided* comprised the empirical dimension. Descriptions of the relationship that characterize the process as *intentional* or *unintentional* comprised the moral dimension (Stone 1989; Harrison and Cohen-Vogel 2012). These codes helped identify how actors attempt to discuss social media and mental health in the context of proponents and opponents of government regulation. These dimensions were applied by examining the overall intent of the various actors. Newspaper article excerpts located in the findings section are identified in parentheses followed by an article and paragraph number. Article numbers can be

found in **Table 4.1**. Paragraph numbers indicate where the excerpt can be found within each referenced article.

Table 4.1. Newspaper Articles Analyzed

#	Title	Source	Date
1	Florida Shooter: When Social Media Foretells a Mass Shooting; Disturbing social-media posts apparently made by school shooter rekindle debate about tech companies' responsibilities to detect threats	<i>The Wall Street Journal</i>	02/16/2018
2	It's Time to Break Up Facebook	<i>The New York Times</i>	05/09/2019
3	To Curb Online Bullying, Instagram Has to Spot It	<i>The New York Times</i>	05/10/2019
4	When the Prescription for Teens Is More Social Media, not Less; Treatments for children with anxiety and depression increasingly push them to navigate Instagram, Snapchat to build relationships with peers	<i>The Wall Street Journal</i>	10/28/2019
5	Why Is Big Tech Policing Speech? Because the Government Isn't Feature	<i>The New York Times</i>	01/26/2021
6	How the Biden Administration Can Help Solve Our Reality Crisis	<i>The New York Times</i>	02/02/2021
7	Eating disorder activists hail Pinterest's ad ban	<i>The Washington Post</i>	07/13/2021
8	The Silent Partner Cleaning Up Facebook for \$500 Million a Year	<i>The New York Times</i>	08/31/2021
9	Facebook buries findings of internal probes, leaks show	<i>The Washington Post</i>	09/19/2021
10	Instagram is worse for kids than we thought. What can we do?	<i>The Washington Post</i>	09/23/2021
11	Facebook to Halt Instagram Kids Project Amid Pressure From Lawmakers, Parents Groups; Move follows concerns about the photo-sharing platform's effects on young people's mental health	<i>The Wall Street Journal</i>	09/27/2021
12	Instagram Is Adult Entertainment; Ross Douthat	<i>The New York Times</i>	09/28/2021
13	Facebook Grilled by Senators Over Its Effect on Children	<i>The New York Times</i>	09/30/2021
14	There's Nothing to Like in Facebook's Plans to Hook Our Kids; Greg Bensinger	<i>The New York Times</i>	09/30/2021
15	Facebook's Trials Aren't Everyone's Tribulations; Facebook appears to be particularly damaging to teens, even compared with other social networks. That could benefit its rivals.	<i>The Wall Street Journal</i>	10/02/2021
16	Facebook Accused Of Putting Profits First	<i>The New York Times</i>	10/04/2021
17	Facebook Whistle-Blower Urges Lawmakers to Regulate the Company	<i>The New York Times</i>	10/05/2021
18	Republican and Democrat Lawmakers Step Up Efforts to Adopt Tougher Tech Laws; Proposals to protect kids online, discourage harmful content gain traction in Congress after years of inaction	<i>The Wall Street Journal</i>	10/19/2021
19	The Facebook Files; A Wall Street Journal investigation	<i>The Wall Street Journal</i>	10/21/2021
20	Eating Disorders and Social Media Prove Difficult to Untangle	<i>The New York Times</i>	10/22/2021
21	Insiders: Zuckerberg chose growth over safety	<i>The Washington Post</i>	10/26/2021
22	Sites defend how they handle kids	<i>The Washington Post</i>	10/27/2021
23	Instagram's Effects on Children Are Being Investigated by Coalition of States; Move raises pressure on parent company Meta Platforms, formerly called Facebook, over the potential harms to its users	<i>The Wall Street Journal</i>	11/18/2021
24	Instagram says parental controls will arrive in March.	<i>The New York Times</i>	12/07/2021
25	Lawmakers urge the head of Instagram to better protect children.	<i>The New York Times</i>	12/08/2021
26	Tech Now Wants to Protect Children	<i>The New York Times</i>	12/13/2021
27	Alleging trauma, moderator sues TikTok	<i>The Washington Post</i>	12/29/2021
28	Facebook shutters highly touted cryptocurrency venture	<i>The Washington Post</i>	01/29/2022
29	Child Safety Is the New Tech Battleground; DealBook Newsletter	<i>The New York Times</i>	02/17/2022
30	Broad measure targets children's online safety	<i>The Washington Post</i>	02/17/2022
31	Lawmakers should reject Instagram's attempts to throw parents under the bus	<i>The Chicago Tribune</i>	02/28/2022
32	State attorneys general ask Snap and TikTok to give parents more control over apps.	<i>The New York Times</i>	03/29/2022
33	Online Privacy Protections Gain Traction With Lawmakers, Tech Industry; Disclosures of social-media harms to young people put pressure on Congress, tech companies to safeguard personal information	<i>The Wall Street Journal</i>	04/26/2022
34	Senator introduces bill that would give Big Tech its own federal watchdog	<i>The Washington Post</i>	05/14/2022
35	Fentanyl Tainted Pills Bought on Social Media Cause Youth Drug Deaths to Soar	<i>The New York Times</i>	05/19/2022

36	Two-thirds of popular apps spy on kids	<i>The Washington Post</i>	06/19/2022
37	It Was a Mistake to Let Kids Onto Social Media Sites. Here's What to Do Now.; Guest Essay	<i>The New York Times</i>	08/05/2022
38	Snapchat Introduces Its First Parental Controls	<i>The New York Times</i>	08/09/2022
39	Snapchat introduces parental controls [Corrected 08/12/2022]	<i>The Chicago Tribune</i>	08/11/2022
40	A Teen's Journey Into the Internet's Darkness and Back Again	<i>The New York Times</i>	08/22/2022
41	Facebook's Four Problems	<i>The New York Times</i>	08/22/2022
42	FTC's newest member wants to scrutinize how tech may harm kids	<i>The Washington Post</i>	08/29/2022
43	Sweeping Children's Online Safety Bill Is Passed in California	<i>The New York Times</i>	08/30/2022
44	Social-Media Firms Would Have to Consider Children's Health Under Bill Passed by California Legislature; New regulations opposed by tech industry come after an earlier bill that would have held them liable for harm to minors	<i>The Wall Street Journal</i>	08/31/2022
45	Indiana sues TikTok over concerns about child safety and data security	<i>The Washington Post</i>	12/09/2022
46	Researchers Report TikTok's Youngest Users Can Encounter Problematic Posts Within 30 Minutes	<i>The New York Times</i>	12/15/2022
47	Most Teenagers Have Seen Online Porn, Report Says	<i>The New York Times</i>	01/10/2023
48	Meta Board Advises Facebook to Update Nude Photo Rules, Citing Gender and L.G.B.T.Q. Biases	<i>The New York Times</i>	01/23/2023
49	After Teenager's Suicide, New Jersey Community Grapples With Bullying	<i>The New York Times</i>	02/14/2023
50	Congress finally wakes up to Big Tech's failure to protect kids	<i>The Chicago Tribune</i>	02/21/2023
51	Let's find common ground on policies to protect youths [Corrected 03/03/2023]	<i>The Chicago Tribune</i>	03/02/2023
52	Utah to Require Parental Consent for Children to Use Social Media; New laws will also require companies to block minors' access to accounts from 10:30 p.m. to 6:30 a.m.	<i>The Wall Street Journal</i>	03/24/2023
53	Lawsuits are piling up alleging that tech platforms harm kids	<i>The Washington Post</i>	04/03/2023
54	Mothers Power New Drive to Make Social-Media Firms Accountable for Harms; Group of women push Congress for laws forcing internet platforms to protect minors from harmful content	<i>Wall Street</i>	04/10/2023
55	Social-Media Platform Discord Emerges at Center of Classified U.S. Documents Leak; The company started as an online space for gamers to gather and has grown to attract a variety of users	<i>The Wall Street Journal</i>	04/10/2023
56	Don't Blame China and TikTok for Child-Rearing Failures; Proposals to ban the popular Chinese app or change its ownership are overbroad and needless.	<i>The Wall Street Journal</i>	04/18/2023
57	Echoes of History in New National Push to Shield Children Online	<i>The New York Times</i>	04/30/2023
58	Officials say social media hurts teens. But scientists say it's complicated.	<i>The Washington Post</i>	05/15/2023
59	Montana Governor Signs Total Ban of TikTok in the State	<i>The New York Times</i>	05/17/2023
60	TikTok Sues Montana, Calling State Ban Unconstitutional	<i>The New York Times</i>	05/22/2023
61	How Governments Are Trying to Keep Young Children Off Social Media, From Face Scans to ID Checks; Lawmakers in the U.S., Europe propose age-verification tools, sparking debate over digital rights	<i>The Wall Street Journal</i>	05/22/2023
62	Utah Law Could Curb Use of TikTok and Instagram by Children and Teens	<i>The New York Times</i>	05/23/2023
63	A Half-Century of Surgeon General Warnings	<i>The New York Times</i>	05/23/2023
64	Social Media Could Pose 'Profound Risk of Harm' to Young People's Mental Health, Surgeon General Warns; Advisory notes benefits of platforms, but urges action to limit any detrimental effects	<i>The Wall Street Journal</i>	05/23/2023
65	Surgeon General Warns That Social Media May Harm Children and Adolescents	<i>The New York Times</i>	05/25/2023
66	Why 16 Should Be the Minimum Age for Social Media; Doctors and policy makers say that 13 is too young for social media	<i>The Wall Street Journal</i>	06/10/2023

The narrative topics and themes can be found in **Table 4.2**. The findings section introduces the prevalent recurring topics for purposes of describing the phenomenon and

applying Stone’s framework across time. Therefore, all 66 articles are not described in-depth for these reasons. Furthermore, only four newspaper articles met the study criteria in 2018 and 2019. Narratives during this timeframe described school shootings, the Cambridge Analytica scandal, Anti-bullying efforts for Instagram, concerns with social media content, and how social media is beneficial for treating anxiety and depression in young people. There was no media coverage in 2020 and this could be explained by the presence of COVID-19. Starting in 2021, coverage on the issue drastically increased and patterns of communication could then be analyzed further.

Table 4.2. Narrative Topics and Themes

Article #’s	Details	Dates
1	school shooting; policing social media; mental health	02/16/2018
2	Cambridge Analytica scandal; Facebook privacy practices and problems; Mark Zuckerberg; Big Tech competitive market growth; regulation limited; Facebook deleted private messages about genocide; national security; China; government censorship; government solutions	05/09/2019
3	Instagram; anti-bullying efforts; artificial intelligence; human reviewers; Facebook; toxic/extreme content; misinformation; depression; anxiety; anti-vaccine misinformation; rampant hate speech/extremism	05/10/2019
4	social media is beneficial for anxiety and depressive disorders; Instagram; Snapchat; emphasis placed on benefits of social connections via social media; research on social media and teen mental health is “inconclusive”; TikTok; therapists and teen support	10/28/2019
5	Parler; Facebook; Twitter; YouTube; Instagram; free speech; rules more stringent; warning labels; misinformation; COVID-19; political posts; First Amendment rights; censorship; capital assault; Apple and Google remove Parler; banned users	01/26/2021
6	YouTube videos; inauguration hoax; QAnon group chats; Trump Administration; Biden Administration; martial law; national problems; conspiracy theorists; COVID-19 vaccine delays; false election fraud narratives; disinformation campaigns; violence; extremism; structural changes needed for tech platforms; audit algorithms; Twitter; Facebook; YouTube; other social media platforms; investigate human rights; social stimulus solution	02/02/2021
7	young adult eating disorder; anxiety; depression; personal stories; social media content; negative mental health impacts of social media; companies lack protection for users; Pinterest – the first platform to ban weight loss ads/testimonials; social comparison	07/13/2021
8	global consulting firm “Accenture”; content control (e.g., removing content related to suicides, beheadings, sexual acts from Facebook); worker mental health problems; lawsuit; payoffs; A.I. limitations	08/31/2021
9	Facebook; teen girls on Instagram; body image and mental health issues; internal research documents; Wall Street Journal investigation: “The Facebook Files”; whistleblower; competitive market	09/19/2021
10	Facebook knows about its harms toward teen girls; body image and mental health; social comparison; research is mixed on well-being; age; parent responsibility	09/23/2021
11	Instagram app for children suspended; lawmakers voice concerns on youth mental health; parent controls; Facebook’s internal research; teen girls and body image concerns; exempt high-profile users; age restriction; Senate commerce committee’s consumer-protection subcommittee and Facebook hearing; Facebook helps teens	09/27/2021
12	Big tech and social media is a problem; revenue based; lack accountability; protect children and adolescents; Wall Street Journal’s internal research on Facebook; Instagram and teen mental health; depression; anxiety; suicide; body image among teen girls; First Amendment protections; age restriction; protect childhood; algorithm concerns	09/28/2021
13	Senate Hearing: “Protecting Kids Online: Instagram and Reforms for Young Users”; lawmakers compare Big Tech to Big Tobacco; Facebook; hides research that show mental and emotional harm on Instagram; Senate hearing; Facebook executives; lawmakers; regulation; safety issues; data privacy; misinformation; research on positive teen experiences; Wall Street Journal Facebook files; paused Instagram kid app;	09/30/2021

	Facebook strengthens safety/privacy features; legislators limitations; researchers access to company data; antitrust issues; profits; toxic content; informed consent; manipulated news feeds	
13,14	Big Tech executives testify that their decisions and actions to improve their platforms prevent harm; directed attention to the positive research and experiences of its users	09/30/2021
15	suicide – numerous factors contribute to the behavior	10/02/2021
16	Frances Haugen, “The Facebook Whistleblower”; claimed spread of misinformation and harmful content was made available through the social media platform; Big Tech responds defending actions	10/04/2021
17	Facebook intentionally deceiving its users; misinformation spreading on social media platforms; market power; privacy concerns; difficult for legislators to address issues – bills on data privacy and changes to speech laws have stalled in Congress; data availability to researchers; COVID-19 related matters; Zuckerberg says news coverage had been misleading about the motives of company and the research was taken out of context	10/05/2021
18	the 1998 Children’s Online Privacy Protection Act; the 1996 Comprehensive Internet Regulations; important for Big Tech accountability; Section 230 protects internet platforms from liability; lobbying efforts from major tech companies described	10/19/2021
19	the Facebook files: a Wall Street Journal investigation	10/21/2021
20	eating disorders; non-profit sector describes research on specific types of disorders; problem for social media companies	10/22/2021
21	Mark Zuckerberg; Vietnam’s Communist Party; censor anti-government dissidents; Asian markets; free speech; social network annual revenue worth billions	10/26/2021
22	lawmakers improve how it verifies age of children online; TikTok; Snapchat; YouTube; protect children online; internal research; improve safety features; data collection on children; drug trafficking; parent groups; age requirements	10/27/2021
23	Instagram; coalition of States investigating effects of social media on children; techniques used by social media companies to increase user engagement; violates consumer protection laws; internal research describing harms	11/18/2021
24,25	lawmakers/Senate panel speak with Adam Mosseri; harmful content; internal research leak; Instagram says parental controls will arrive in March; child safety; new child safety guidelines in Britain; strict age verification systems	12/07/2021 12/08/2021
26	new British guidelines influence how U.S. internet companies provide protection to American children; accountability; improved privacy settings; GPS tracking systems; age verification systems; safeguards against harms	12/13/2021
27	TikTok; ByteDance; content moderator suffers psychological trauma; content moderator reviewed related to violence (e.g., sexual assault, beheadings, suicide, genocide, child rape, animal mutilations); anxiety; depression; posttraumatic stress disorder; safe work environment; lawsuit against company in federal court	12/29/2021
28	Facebook; cryptocurrency; metaverse; regulation issues	01/29/2022
29,30	new restrictions on internet platforms; bipartisan bill introduced in Senate to empower parents: “The Kids Online Safety Act”; “Britain’s Age Appropriate Design Code”; “California Age-Appropriate Design Code Act”; data collection on minors; GPS tracking	02/17/2022
31	Big Tech shifts blame onto parents and alerts lawmakers to be cautious about government decisions	02/28/2022
32	State attorneys general; Snapchat; TikTok; parental controls; children exposure to sexually explicit content; negative body image; violence; social media companies improve features for parent supervision on platforms	03/29/2022
33	Congress action; Facebook; Instagram; TikTok; antitrust legislation; need for a comprehensive federal private policy; consumer protection; young users; age-appropriate content; harmful content and exposure	04/26/2022
34	federal watchdog needed for tech companies; the Digital Platform Commission Act; algorithms; new rules set; problems relating to disinformation; Russia; election interference; children’s safety; data privacy	05/14/2022
35	Fentanyl; Percocet; social media purchases; death among young people; tainted pills by Mexican cartels with chemicals from China and India; addiction; policing social media; grieving parents	05/19/2022
36	collection of personal data on children; privacy concerns; GPS location; tracking	06/19/2022
37	kids on social media sites; Children’s Online Privacy Protection Act of 1998; parental consent; children; dangers are quantifiable (examples: negative body image, depression, self-harm, muscle dysmorphia, sexual exploitation, deadly stunts, bullying, harassment, conspiracism, fear of missing out); age restriction; age verification; penalties; restrict access to pornography; parent empowerment	08/05/2022
38,39	Snapchat; parent controls; young users exposed to harmful content; Britain’s new child-safety regulations	08/09/2022 08/11/2022
40	personal stories from teens on specific topics related to using social media; social connection; sexually explicit content; depression; self-harm; federal funding is lacking for research	08/22/2022
41	Facebook has problems with age, innovation, antitrust, and the metaverse	08/22/2022
42	Federal Trade Commission can assist in concerns about children’s and teens’ mental health in online environments; personal data collection; algorithms	08/29/2022

43,44	California: children’s online safety bill passed, legislation is overly broad and would submit online services to unnecessary burdensome rules; scope of bill “too broad” and provisions “too vague”; age verification for all users	08/30/2022 08/31/2022
45	lawsuits and TikTok; Indiana’s lawsuit – China using American consumer information in its name of its own national security; U.S. policymakers raise concerns about privacy/data; children’s online safety; national security	12/09/2022
46	TikTok; youth exposed to problematic posts within 30 minutes; eating disorders; teenagers	12/15/2022
47	sexually explicit content; porn industry; Instagram; OnlyFans; PornHub; teenagers	01/10/2023
48	Meta board advises Facebook to update nude photo rules; unclear policies; gender and LGBTQ biases	01/23/2023
49	story of teen suicide in New Jersey; TikTok; social media; bullying; school district response	02/14/2023
50	Congress takes steps to make Big Tech accountable; review of past bills: EARN IT Act and the MATURE Act; age restriction emphasized; 2023 State of the Union Address; Biden Administration; tech agenda to protect the privacy of children/teens online	02/21/2023
51	stories of teenage crimes (e.g., homicide, theft, carjackings, assault); legislation needed for age requirements on social media platforms; youth exposed to content that has adult themes	03/02/2023
52	Utah signed two bills to regulate social media among children and teens - would require parental consent for children to use social media; new laws would also require companies to block minors' access to accounts from 10:30 p.m. to 6:30 a.m.; personal stories from teens on specific topics related to using social media described; digital civil liberty groups opposed regulations – less security/less privacy for users; First Amendment concerns	03/24/2023
53	social media platforms being sued due from intentionally designing their platforms to be addictive for profit; Arkansas state official announce lawsuits against Meta and TikTok	04/03/2023
54	parent groups - a group of women push Congress for laws forcing internet platforms to protect minors from harmful content; death of children	04/10/2023
55	leak of highly classified U.S. documents on Discord; child porn; violence; Defense Department; hate and online extremism	04/10/2023
56	TikTok; executive orders; national security threat	04/18/2023
57	history of online age and content rules; new national push to shield children online	04/30/2023
58	social media and mental health – a complex problem; social media “is not inherently beneficial or harmful to young people”; individual factors; parental controls; lawmakers; age-appropriate measures	05/15/2023
59	Montana: Gov. Greg Gianforte signed a total ban on TikTok in the State; First Amendment rights and national security concerns	05/17/2023
60	TikTok sued to block Montana ban; state ban unconstitutional; First Amendment rights	05/22/2023
61	lawmakers in the U.S. and Europe propose age-verification tools – Face scans and ID checks; sparking debate over digital rights; age verification – part of proposed solution; targets porn sites; parent concerns and individual responsibility	05/22/2023
62	Utah: Gov. Spencer Cox signed a social media bill that would limit youth access to TikTok and Instagram; parent accessibility; time restrictions for minors; parental controls; mental health concerns; privacy and free speech concerns; age verification systems and parental consent for users under 18; social media benefits marginalized youth who need support/social connection	05/23/2023
63-65	Surgeon General warnings current and historical movements; public awareness; risk factors of social media on young people; profound risk of harm to adolescent mental health; Dr. Vivek Murthy urges policymakers and tech companies to strengthen standards for adolescents; enforce minimum age limits; default settings for children; high safety and privacy standards; positive factors of social media; social connection.	05/23/2023 05/25/2023
66	minimum age on social media; doctors and policymakers’ detail 13 as too young; 1998 Children’s Online Privacy Protection Act; parent recommendations for childrearing	06/10/2023

3. Findings

The Proponents: An Intentional/Complex Causal Narrative

Through reporting of confidential information by whistleblowers, senate hearings, new legislation, arising lawsuits, scientific research, parent groups, Big Tech employees, and Britain,

proponents for increasing government intervention on the topic of social media and mental health constructed an intentional/complex causal narrative. The narratives primarily frame Facebook as intentionally hiding research from the public that describe mental and emotional harm directly caused through its photo-sharing app, Instagram. Various harms and issues are described and extended to other social media platforms in the causal stories that follow.

Frances Haugen, known as the Facebook whistleblower, was a Product Manager for Facebook and is known for making the public aware of “tens of thousands of pages of internal documents” (16, para. 3). She is described as a hero in the narrative concerning social media. For example, John Tye, founder of the Whistleblower Aid, said she “is a very courageous person and is taking a personal risk to hold a trillion-dollar company accountable” (16, para. 4). However, the article also states that she served two years on the civic misinformation team¹ before leaving the company. Ms. Haugen also accused “Facebook of misleading investors with public statements that did not match its internal actions” (16, para. 9) in a whistle-blower complaint filed with the U.S. Securities and Exchange Commission.

In October of 2021, *The Facebook Files – A Wall Street Journal Investigation* made headlines. The central findings framed Facebook as knowing “in acute detail, that its platforms are riddled with flaws that cause harm, often in ways only the company fully understands” (19, para.1). Among the findings in the internal research documents, it described Instagram as contributing to risk of suicide ideation and negative body image in teenage girls. Facebook had rule exemptions for high-profile users and algorithms on the platform had instigated anger. A lack of company response or concern occurred for content related to drug cartels, violence, and human traffickers, which were flagged by employees. Additionally, the promotion of Covid-19

¹ Facebook’s civic misinformation team.

vaccines, a priority during that time, backfired by posts created by activists; and efforts were made to understand how to attract preteens and teens onto their platforms (19).

Other topics that impact future decisions made by Facebook include problems with shifting power roles and priorities, artificial intelligence and content, multiple user accounts, and hate speech and politics (19). Congressional hearings occurred directly after the series of articles was released. The narrative became more complex due to the range of problems detailed. Stone (1989) describes these complex interactive systems resulting in accident or failure due to the depth of all possible outcomes and effects being uncertain to begin with (p. 288).

On December 8, 2021, a Senate hearing was titled: “Protecting Kids Online: Instagram and Reforms for Young Users.” Senator Richard Blumenthal (D-CT), Chair of the Subcommittee on Consumer Protection, Product Safety, and Data Security, voiced his concerns and placed blame and responsibility on Facebook in an article published by the *New York Times*:

It has attempted to deceive the public and us in Congress about what it knows, and it has weaponized childhood vulnerabilities against children themselves. It’s chosen growth over children’s mental health and well-being, greed over preventing the suffering of children (13, para. 4).

Additionally, Senator Blumenthal stated that the committee would be moving forward with developing legislation and that self-policing of social media companies was no longer a viable solution to the concern due to the addictive effects of the platform content.

Frances Haugen took a similar stance in her testimony that Facebook was intentionally deceiving its users:

The company’s leadership knows how to make Facebook and Instagram safer, but won’t make the necessary changes (17, para. 5).

During that time, Instagram put a halt on moving forward with their creation of an app for kids due to the ongoing negative publicity and public pressure. Antigone Davis, Facebook's Global Head of Safety was persistent on improving the conditions by providing stronger safety and privacy features on the app. However, lawmakers began comparing Big Tech to Big Tobacco. Senator Edward J. Markey (D-MA), was quoted saying that "Facebook is just like Big Tobacco, pushing a product that they know is harmful to the health of young people, pushing it to them early" (13, para. 18). In the *Chicago Tribune*, an article was published that described how the shift of responsibility from blaming Big Tech was instead focused on parents and alerted lawmakers to be cautious about decisions in moving forward (31). Dr. Brian Primack, Dean of Public Health at Oregon State University, said:

Two decades ago, the tobacco industry used a similar strategy to deflect blame. For example, Phillip Morris (which has since changed its name to Altria) developed a series of parent-focused "anti-tobacco" materials with titles such as "Raising Kids Who Don't Smoke" and "Could Your Kid Be Smoking?" These titles were paired with images such as a suspicious parent smelling a teen's clothing before putting it in the laundry (31, para. 2). Published research demonstrates that these campaigns fueled interest in smoking rather than curtailing it. These campaigns helped the industry distance itself from responsibility. By framing the situation in this way, Big Tobacco engendered the impression that if a teen began to smoke, it was purely the fault of the parent (31, para. 3).

Congress has met with Facebook and other similar companies in the past (13, para. 19). Specifically, they inquired about problems with misinformation being spread on their platforms, market power, and privacy concerns. However, it has been difficult for legislators to determine

the best way to create new laws that address these issues. For example, in another *New York Times* news article released in October 2021, it mentioned that “dozens of bills on data privacy and changes to speech laws have stalled in Congress. House lawmakers approved a series of bills meant to strengthen antitrust laws this year, but the full House has not taken up the legislation, and its prospects in the Senate appear dim” (17, para. 16).

In January-October of 2021, the narrative involved discussions for the need of making company data available to researchers so scrutiny of its services could occur in the future. The conversation transitioned to COVID-19 related matters and the platform was criticized for its reliance on “technology tools” to detect misinformation (related to vaccines and public health initiatives) (17, para. 23). Ms. Haugen saying Facebook was “overly reliant on artificial intelligence systems that they themselves say will likely never get more than 10 to 20 percent of the content” (17, para. 23).

Mark Zuckerberg, Executive Chairman and CEO of Facebook, Inc. (now Meta Platforms), was criticized by several senators stating he made “decisions that eschewed safety and privacy. He approved of promoting posts that generated the most engagement” (17, para. 24).

Antitrust issues, profits, and toxic content were among the repetitive topics presented within the narratives that placed emphasis on years of data collection on its users. Additionally, data was collected without user consent and the news feeds on these platforms were described as being manipulated. Senator Marsha Blackburn (R-TN), a member of the Subcommittee on Consumer Protection, said “you’ve lost trust, and we do not trust you with influencing our children” (13, para. 6). Senator Ted Cruz (R-TX), made a comment blaming the company for

releasing only the data that was consistent with their message, saying: “so you’ve cherry-picked part of the research that you think helps your spin right now” (13, para. 14).

Furthermore, revising prior policies such as “the 1998 Children’s Online Privacy Protection Act and the 1996 Comprehensive Internet Regulations” (18) were described as necessary to make Big Tech accountable and ensure young people were protected to mitigate the harms that have occurred on social media platforms. Senator Ed Markey (D-MA), principal author of the 1998 Children’s Privacy Law, said during the hearing: “The public is demanding action, and there is bipartisan support for congressional efforts to, at the very least, update the laws protecting our kids online” (18, para. 20). The House Energy and Commerce Committee created a new proposal that would revise Section 230 that protects internet platforms from liability, hoping it “would remove the liability shield where a platform uses personalized algorithms to promote harmful content. That is a potentially major change that would discourage targeted promotion of misleading and harmful content” (18, para. 28).

However, Republicans and Democrats had alternative views for modifying the liability shield. This stalled further action on the proposal. Mimi Walters (R-CA), said “Democrats want increased censorship of speech with which they disagree, while Republicans want accountability for arbitrary censorship” (18, para. 30).

In the *Chicago Tribune*, an article focused on how Congress was taking steps to make Big Tech accountable. Senator Dick Durbin (D-IL), Chair of the Senate Judiciary Committee said in the session, “I don't know if any or all of you realize what you witnessed today”...“But this Judiciary Committee crosses the political spectrum, not just from Democrats to Republicans, but from real progressives to real conservatives. And what you heard was the unanimity of purpose” (50, para. 3). The article also stated that it has been twenty-five years since Congress

passed a law that protected children from the potential harms of the internet, such as sexual exploitation, mental health problems, and privacy concerns and access to data for a variety of purposes (50, para. 4). Though the purpose of passing the Child Online Protection Act of 1998 was to restrict access to harmful material on the internet to minors, the law never did take effect. “Three rounds of litigation led to a permanent injunction against it in 2009” (50, para. 8-9). Senators Richard Blumenthal (D-CT) and Lindsey Graham (R-SC) reintroduced an act called EARN IT “that would remove the benefits of Section 230, the law that protects online services from lawsuits” (50, para.14).

Senator Josh Hawley (R-MO), proposed a bill called Making Age Verification Technology Uniform, Robust, and Effective (MATURE Act). His efforts were to "create a legal age to be allowed on social media" (50, para. 17). “The MATURE Act would require social networks to verify that users are at least 16 years old through a verification process that, privacy experts note, would require even more of the data collection than already troubles many Americans” (50, para. 18). Other states were beginning to create online safety acts and more court proceedings would be likely (50, para. 19). Furthermore, testimony from parents of young people were mentioned as helping aid the process of getting laws to pass in the U.S. Senate (50, para. 21).

The strategy for making Big Tech accountable was also persistently mentioned throughout the narratives. Senator Blumenthal (D-CT), said "There has been a deafening . . . drumbeat of continuing disclosures about Facebook. They have deepened America's concern and outrage and have led to increasing calls for accountability, and there will be accountability" (22, para. 15).

Another element of the causal narrative from supporters revealed an unintended outcome from social media companies. In this case, social media companies were at a high risk of lawsuits being made against them due to the public exposure of concealing internal research from vulnerable users. For example, an agreement could not be reached between the two sides of the debate focused on a bill that verified age restrictions, especially among children. Michael Beckerman, a TikTok Executive said the bill would be supported if “lawmakers made an "improvement" to how it deals with verifying children's age online” (22, para. 24). Among components of the bill, it would open the door for lawsuits against the companies for having child exploitative material on their platforms. In the past, it was detailed that some companies have faced public scrutiny for their way of handling matters regarding kids online. Specifically, it was noted that in 2019, Google paid \$170 million in a settlement that alleged that YouTube had illegally collected data on toy videos and tv shows that children aged 13 and under had watched (22, para. 27).

According to a *Washington Post* article in 2022, a bipartisan bill was introduced in the Senate that was aimed toward empowering parents. The bill was titled the Kids Online Safety Act, which was co-sponsored by Senators Richard Blumenthal (D-CT) and Marsha Blackburn (R-TN) (30). The bill “would require online platforms to provide parents and minors younger than 16 with "easy-to-use" tools to keep them safe, limit screen time and protect their data. It would demand that companies create tools to allow parents to track how much time their kids spend on a service, or to opt out of features such as autoplay that might extend time online. Companies would also have to offer parents and minors the ability to modify tech companies' recommendation algorithms, allowing them to limit or ban certain types of content.” (30, para. 2).

An unexpected element of the causal narrative from supporters revealed an intended outcome from government. In this case, government was developing specific measures due to national security concerns that would in turn spread globally and create change. For example, due to inaction in Congress, social media companies began making efforts to improve their platforms with a focus on the safety of children due from public pressures and exposure from the initial leak from the Facebook whistleblower. This action tends to show a preference by social media companies to make decisions without any government interference. In addition to this occurrence, Britain's Age-Appropriate Design Code also promoted change (30, para. 8). Since then, Big Tech companies have all made changes but in distinct ways. For example, Instagram created features such as "take a break" and restricted content that had been developed using algorithms recommended to social media users in the past. TikTok revised its rules about eating disorders and strengthened policy on suicide-related content (30, para. 8).

Another bill that focused on children's safety online has also gained the attention of state legislatures. Buffy Wicks (D-CA) and Jordan Cunningham (R-CA) introduced the "California Age-Appropriate Design Code Act," following guidelines from Britain (30, para. 9). Wicks stated that "if the bill were to pass in California, it could have ripple effects throughout the country, like the state's broad digital privacy law" (30, para. 9).

The narrative provides the perception that once one bill is passed in one country or even state, that it will be repeated, similar to policy diffusion described by Berry and Berry (1990). Wicks added, "If you have European standards and California standards, chances are you're going to follow those standards even in other parts of the country" (30, para. 10).

In August 2022, a *New York Times* article reported on Snapchat introducing parental controls, the first of its kind (38). Parent transparency would involve the ability to see who their

teens were friends with and who they had communicated within the past seven days. Parents could report accounts that violate the policies of the app. However, parents would not be able to see conversations of their children using the app (38, para. 3). “To gain access to the controls, people have to create Snapchat accounts and be friends with their children, who have to agree to the controls. The company said it would introduce additional features later, including one that lets parents see whom their children recently became friends with. Teenagers will also be able to notify their parents if they report accounts or content” (38, para. 4). Snapchat stated in a blog post, “Our goal was to create a set of tools designed to reflect the dynamics of real-world relationships and foster collaboration and trust between parents and teens” (38, para. 5).

There was an influx of lawsuits after these occurrences. For example, in a *Washington Post* article, the narrative focused on lawsuits made against TikTok (45). Todd Rokita, Republican Attorney General of Indiana, sued the company for (1.) inappropriate content that minors were exposed to and (2.) data accessibility problems with China. Two lawsuits were filed against the company and it was argued the government of China had access to the interests and facial features of its users, deceiving consumers about the security of their data and content that was accessible to young teens (45). Also, state officials from Arkansas took action by filing lawsuit’s against Meta and TikTok. The lawsuit accused the companies of misleading “younger users about the "addictive" nature and the availability of adult content on their platforms” (53, para. 1). Additionally, “a coalition of state attorney generals has separately been investigating whether major platforms including Instagram and TikTok are adversely impacting kids and teens” (53, para. 3). Jim Steyer, President of Common Sense Media, said, "At this rate, it looks like social media platforms are going to find themselves being sued in nearly every state of our

nation because they have *intentionally designed their platforms to be addictive* to kids and teens in order to make them a profit center for the companies" (53, para. 4).

The narrative placed intentional blame directly on the social media companies and recommended strengthening standards of usage. For example, social media companies intentionally designed their platforms and algorithms to increase user engagement.

Governor Sarah Huckabee Sanders (R,AR), was quoted in *The Washington Post* saying: "We have watched over the past decade as one social media company after another has exploited our kids for profit and escaped government oversight" (53, para. 9). Additionally, Dr. Vivek Murthy, U.S. Surgeon General, warned of the potential risk social media has on young people and "urged policy makers and technology companies to strengthen standards for adolescents" (64, para. 1).

Indiana's lawsuit stated "that China could use the vast amount of American consumer information tracked and collected by TikTok in the name of its own national security or "to spy on, blackmail, and coerce" users. The suit echoed long-standing U.S. government concerns that China could access American user data through ByteDance" (45, para. 4). The second lawsuit filed by Indiana states that consumers were misled about the safety of children using the app. "The state's court filings dispute the app's 12-plus age rating and "infrequent/mild" designation for content about sex, drugs, alcohol and violence in Apple's App Store" (45, para. 5). The TikTok app has become popular among young people and "U.S. policymakers have raised concerns about privacy and data, children's online safety, and national security. TikTok executives have said the app does not share information with the Chinese government and have attempted to quell fears from members of Congress about national security and transparency" (45, para. 9). TikTok also stated in a dispute against the lawsuit that the data collected has not

been stored in China and was not subject to the law in China (45, para. 10). Brooke Oberwetter, from TikTok, made a statement in an email correspondence to *The Washington Post* and said, the well-being of youth “was part of TikTok's policies, including age-limited features and tools for parents to control what children view” (45, para. 11) and "While we don't comment on pending litigation, the safety, privacy and security of our community is our top priority” and "We are also confident that we're on a path in our negotiations with the U.S. Government to fully satisfy all reasonable U.S. national security concerns, and we have already made significant strides toward implementing those solutions" (45, para. 12).

Some states limited access to the data collected by TikTok. Governor Greg Abbott (R-TX), ordered state agencies to ban employees from using TikTok on government-issued devices and South Dakota and Maryland made similar directives (45, para. 13).

Big Tech companies also took action by pushing blame to other Big Tech companies. For example, “The growing pushback against TikTok has included competition from fellow social media behemoths. Meta, which owns TikTok's rivals Facebook and Instagram, hired a major Republican consulting firm to conduct a campaign to turn public opinion against TikTok, partly in a bid to distract from scrutiny of Meta” (45, para. 15). Stone (1989) describes this occurrence by describing how those blamed for a specific problem will resist by pushing blame to others. This creates a condition for reform (p. 299).

Proponents of government intervention said that "TikTok intentionally falsely reports the frequency of sexual content, nudity, and mature/suggestive themes on the TikTok platform to the App Store because TikTok wants to keep and increase young users' engagement with the TikTok platform" (45, para. 20).

The porn industry worth billions was also a topic of discussion in the narratives and has always been market driven. The online environments create loopholes that can be easily navigated with expert knowledge and group status (e.g., the dark web). “Part of the issue is that online pornography is a highly lucrative industry, giving it a firm foothold. While there is little data on the size of the online pornography industry, one estimate from Alec Helmy, the founder of the trade publication XBIZ, which surveys payment processors, puts revenues for adult influencers and platforms at at least \$15 billion in 2022. He estimated revenues from internet pornography in 2012 were \$5 billion” (47, para. 9). Some of the social media platforms that promote and/or host features for online pornography include Instagram, OnlyFans, and PornHub (47, para. 10).

In the 2023 State of the Union address, President Joe Biden, “unveiled a tech agenda focused on protecting the privacy of children and teens online” (50, para. 10) and said, "It's time to pass bipartisan legislation to stop Big Tech from collecting personal data on our kids and teenagers online," and "Ban targeted advertising on children, and impose stricter limits on the personal data that companies collect on all of us" (50, para. 11).

In summary, proponents for government action presented an intentional/complex narrative in their arguments against Big Tech. Blame and responsibility was placed directly on Big Tech companies and the need to hold them accountable by government action or policy standards. Narratives framed the problems as a result from algorithms being intentionally designed to keep users on social media platforms. Additionally, internal research described how companies, especially Facebook, knew about the mental health risk due from the exposures.

The Opponents: An Emergent Inadvertent/Complex Narrative

Big Tech executives, health professionals and researchers, lobbyists, interest groups, and social media users opposed government efforts to regulate social media platforms. Unguided action in these scenarios often lead to unintended consequences, that being the negative content that has landed within public awareness and concern. Those who portrayed an opposing narrative to the efforts to increase government control on social media platforms, referred to the positive experiences young people had expressed in using their platforms and research pointing to positive outcomes. In addition to this, all Big Tech companies claimed to offer better controls, such as parent tools, increased security, and privacy measures.

In a 2021 Senate hearing, the narrative initially placed blame on Big Tech companies, which was primarily Facebook. Big Tech executives testified that decisions and actions have been taken to improve their platforms and prevent harm. In fact, the executives disputed the harmful claims and directed their attention to the positive findings from research and the positive experiences users have on their platforms. Antigone Davis, Global Head of Safety for Facebook, said “Our products actually add value and enrich teens’ lives, they enable them to connect with their friends, their family” (14, para. 3) and “Right now, young people tell us — eight out of 10 tell us — they have a neutral or positive experience on our app,” she said. “We want that to be 10 out of 10. If there is someone struggling on our platform, we want to build product changes to improve that experience and help support that” (13, para. 9).

Another part of the narrative involved the claim that the spread of misinformation and harmful content was made available through social media platforms. Lena Pietsch, from Facebook said the company was making “significant improvements to tackle the spread of

misinformation and harmful content. To suggest we encourage bad content and do nothing is just not true" (16, para. 16).

Individuals from the nonprofit sector described research on specific types of health disorders that were mentioned as being caused by using Instagram. Chelsea Kronengold, from the National Eating Disorders Associations, said, "Social media in general does not cause an eating disorder. However, it can contribute to an eating disorder" (20, para. 9) and "There are certain posts and certain content that may trigger one person and not another person. From the social media platform's perspective, how do you moderate that gray area content?" (20, para. 9). The topic of suicide was also discussed by a spokesperson from Facebook. Pratiti Raychoudhury, Head of Research at Facebook, defended their findings saying, "that of the entire group of teens who took its survey, about 1% said they had suicidal thoughts that they felt started on Instagram" (15, para. 6). Social media can contribute to suicidal behaviors and outcomes; however, due to the wide range of factors that can contribute, it has been difficult to develop workable solutions. Facebook's CEO, Mark Zuckerberg, said in defense of the company that "news coverage had been misleading about the company's motives and that the company's research had been taken out of context. He said it was "deeply illogical" that Facebook would prioritize harmful content because advertisers don't want to buy ads on a platform that amplifies hate and misinformation" (17, para. 12). Stone (1989) describes causal stories as needing to be "fought for, defended, and sustained" (p. 293). Furthermore, she describes how causal beliefs are sensitive to media portrayals of problems and that the way these stories are framed can influence perception among the public.

In efforts to combat efforts of reform by the proponents, an article from *The Wall Street Journal* also mentioned the extensive lobbying efforts from major technology companies that

were occurring in Washington, such as Alphabet Inc.'s Google and Apple Inc. For example, “through the first half of this year, Amazon spent \$10.2 million on lobbying operations and Facebook spent \$9.6 million, according to the nonpartisan OpenSecrets, ranking them first and second among business lobbyists” (18, para. 9-10).

Though there were competing sides to the argument for more government action toward Big Tech, the one common denominator was the safety of young children and teens. Adam Mosseri, Head of Instagram, said “But I want to assure you that we do have the same goal. We all want teens to be safe online” (25, para. 11).

Personal stories from teens have been part of the narrative of placing blame and responsibility on social media. Some of the stories included inappropriate nude images and requests for sex being sent through the platforms that ultimately led to mental health problems among the recipients of the content (40). On the other hand, teens also described the challenge of giving up social media platforms from a survey (52).

The issues were identified as being complex and a shift of blame focused on federal funding. Specifically, the complexity of the issue remains unknown due to a lack of federal funding for further research to better understand the underlying emotional effects of virtual interactions that take place on social media platforms. Kimberly Hoagwood, a psychiatrist from NYU Langone Health, said, “The federal funding, or lack thereof, has contributed enormously to the place we’re at” (40, para. 11).

The narrative among opponents includes being concerned with the spillover effects and unintended outcomes that could result from legislation. Opponents of California’s new law on children’s online safety stated the legislation was “overly broad” and “could subject many more online services than necessary to burdensome rules” (43, para. 11). Furthermore, opponents “said

the wide mandate could pose problems for businesses. Among the most visible critics: the California Chamber of Commerce and TechNet, a tech industry association whose members include Amazon, Apple, Cisco, Google, Oracle, Pinterest, Snap and Meta, the social media giant formerly known as Facebook” (43, para. 26). Industry groups also insisted that lawmakers from California should narrow down the definition for a child to a specific age group of 16 or younger instead of a minor under the age of 18. Another argument involved the overall scope of the bill being “too broad” and provisions being “too vague” to execute (43, para. 27).

Other concerns voiced by the Chamber of Commerce and TechNet involved the difficulty in interpreting the “best interests” of children. Additionally, the “broad focus” geared toward online services would impact more websites and platforms than would be necessary (43, para. 28). Civil liberty experts also raised concerns regarding consumer privacy that may initially be geared toward children and opens the door for similar “unintended consequences for adults” (43, para. 29). The Electronic Frontier Foundation, a digital rights group, communicated with legislators that “such a system would likely lead platforms to set up elaborate age-verification systems for everyone, meaning that all users would have to submit personal data and submit to more corporate surveillance” (43, para. 30).

A trade group (The News/Media Alliance) that represented publishers like the *New York Times* lobbied for change and said, “the language of the bill could require newspapers and magazines to undertake costly changes like instituting age verification for online readers or creating different versions of articles for minors” (43, para. 31). Due to these concerns, legislators did make a few changes, such as adding a provision that would offer a grace period to companies to address violations once a notice is received from regulators (43, para. 32).

Dylan Hoffman, Executive Director of TechNet, was quoted saying that, "We support the intent of this bill, and protecting children online remains a priority. But it must be done responsibly and effectively" (44, para. 16). He also voiced his concerns: "While this bill has improved, we remain concerned about its unintended consequences in California and across the country" (44, para. 17).

After Utah enacted two bills (S.B. 152 and H.B. 311) that regulated social media among children and teens, it focused on keeping teens safe. Meta Platforms Inc. responded by saying: "We've developed more than 30 tools to support teens and families, including tools that let parents and teens work together to limit the amount of time teens spend on Instagram, and age-verification technology that helps teens have age-appropriate experiences" (52, para. 5) and "We'll continue to work closely with experts, policy makers and parents on these important issues" (52, para. 6). "If S.B. 152 is implemented as written, the majority of young Utahns will find themselves effectively locked out of much of the web," said The Electronic Frontier Foundation (52, para. 9). A spokesperson from Meta focused on demonstrating that there was a "misunderstanding of issues" that impact other platforms as well. (52, para. 22).

The Electronic Frontier Foundation, a digital civil-liberties group, opposed the new regulations and stated that "the age-verification law would make users less secure and make internet access less private overall. The group also expressed First Amendment concerns" (52, para. 8). After the Governor of Montana signed a total ban of TikTok, Brook Oberwetter, from TikTok, said in response for the company that "Governor Gianforte has signed a bill that infringes on the First Amendment rights of the people of Montana by unlawfully banning TikTok, a platform that empowers hundreds of thousands of people across the state" (59, para.

7). “Montanans, she added, can keep using the app “as we continue working to defend the rights of our users inside and outside of Montana” (59, para. 7).

Free speech groups such as, The American Civil Liberties Union, argued that “The government cannot impose a total ban on a communications platform like TikTok unless it is necessary to prevent extremely serious, immediate harm to national security”...“But there’s no public evidence of harm that would meet the high bar set by the U.S. and Montana Constitutions, and a total ban would not be the only option for addressing such harm if it did exist” (59, para. 14).

National security threats were among the topics in the narrative. In fact, in 2020, President Trump issued an executive order that claimed that TikTok was a threat and he had directed the U.S. Commerce Department to prevent the app from being downloaded. However, TikTok sued in order to block it and a federal judge ruled the Trump administration overstepped its authority (56, para. 2). The Biden administration took another approach by suggesting that “TikTok's owner, ByteDance,” should “sell the app to a buyer that the government can trust or face a ban in the U.S., and it's urging Congress to pass legislation to restrict TikTok's use. State and local policy makers are also starting to intervene” (56, para. 5).

Age verification technology features were part of the proposed solution and debate. Evan Greer, Deputy Director of Fight for the Future, said "At the platform level it almost certainly involves invasive data collection." (61, para. 18). Furthermore, “Many new bills and laws require companies to take active measures to verify ages. That could entail using an official ID or analyzing a user's face with a webcam to estimate their age” (61, para. 30).

Parents also voiced concerns about the new rules, saying that it is their primary responsibility to make decisions regarding the use of social media for their children, not the

government. Also, privacy concerns were another topic among parents that focused on problems with age verification systems (61, para. 27).

Access to social media may be important for marginalized youth who don't have support at home. Dr. Sarah Coyne, a Professor from Brigham Young University, said, "We know that marginalized youth, such as L.G.B.T.Q. kids, use social media in some really important ways to find belonging and support, especially when they don't have family support" (62, para. 15). Dr. Vivek Murthy made a similar comment: "on the positive side, social media can help many young people by giving them a forum to connect with others, find community and express themselves" (65, para. 14).

Social media and mental health narratives that opposed government action framed their defense in an inadvertent-complex narrative that Stone describes. Efforts focused on the steps Big Tech had taken (e.g., parental controls, content tools created and curtailed to address concerns of potential harm) and what public health experts had found in their research that contradicted causal claims that placed blame and responsibility primarily on Big Tech companies. Lawsuits were filed against Big Tech corporations alleging that they intentionally designed their platforms to increase user interactions.

Social media companies were described as misrepresented, and the research of the opposing party taken out of context. Therefore, an intentional narrative was unlikely due to the emphasis placed on a complex health problem and issue that differed from one individual to another. Stone (1989) describes these complex explanations in politics as being limited by their means to determine a single position of control, responsibility, or leverage points within complex social systems (p. 289).

4. Limitations

While this study offered an in-depth analysis of textual data relating to social media and mental health, there are limitations that warrant consideration. First, qualitative content analysis has been described as an “overly simple method” (Elo and Kyngäs, 2008, p. 113) and the “simple” results from the study may indicate an incomplete analysis (Weber, 1990). Second, the interpretation by researchers may become excessive and could pose a threat to a successful analysis (Elo and Kyngäs, 2008). This analysis included similar challenges. The data was repetitive in nature and excessive across a range of topics that appeared within the narratives. Future research should consider expanding data sources to interviews to further explore specific questions needed to clarify specific details from the research analysis. However, it is known that all qualitative research methods have similar flaws (Elo and Kyngäs, 2008).

5. Discussion – Conclusion

Results from this analysis provided a systematic summary of narratives/arguments pertaining to social media and mental health among young people, their families, communities, and broader societal influencers.

Proponents and opponents of greater government regulation were comprised of complex stories about social media use in young users and how social media has become the primary cause of the health crisis. Stone (1989) describes this behavior: “As one side in a political battle seeks to push a problem into the realm of human purpose, the other side seeks to push it away from intent toward the realm of nature or to show that the problem was intentionally caused by someone else” (p. 292). The causal narratives on the pro-regulation side appeared to support

increased parental controls, age verification systems, and algorithmic controls as solutions to help improve young users access to age-appropriate content.

On the other side of the debate, the anti-regulation side stressed First Amendment concerns, limited public health research, and that future research was required before moving forward with any proposed legislation.

Stone's causal stories framework was validated in our study due to the complex nature in the stories involving numerous interest and actors across the five-year timeframe. Advocates for and against policy reform appeared to align with Stone's framework in the sense that it demonstrated how political actors push an issue from a strong position to a relatively weaker one throughout the process (Stone, 1989).

Findings suggest that Stone's framework is limited by the component of government interest and national security, which this study demonstrated had a crucial role in change and policy action. Creating a framework that focuses on government leadership, funding, and actions would improve the design and enhance understanding of policy processes.

Therefore, future research should look at the relationship between governmental actors, government spending, and interest group connections to various departments within complex organization structures, and how the past decisions are related to the current ones and how it impacts social systems across time.

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Chapter V

Conclusion: Summary of Research, Future Research, and Policy Recommendations

Summary of Research

Among the results from article 1, findings suggest that people with high agreeableness had a lower risk for developing depression, while those with high neuroticism had a higher risk. For each personality trait, increased social media use was associated with developing depression at 6-month follow up. The major finding was that regardless of personality trait, reducing time spent on social media is a valuable public health intervention.

Findings from article 2 suggest a possible link between reduced anxiety and perceived social media emotional support. This finding was more pronounced among females. In terms of personality, people with high openness, high extraversion, high agreeableness, and low conscientiousness had higher perceived social media emotional support scores. Emotional support may be an important factor for overall well-being on social media platforms.

The results from article 3 confirmed aspects of Stone's causal stories framework relating to processes within the narratives that focus attention on weak to strong positions. More specifically, narratives on government regulation from the proponents framed a solution as making Big Tech accountable through policy reform. Opponents focused on limiting/stalling government action. Concerns were voiced by Big Tech executives, health professionals and researchers, lobbyists, interest groups, and social media users. Stone's causal stories framework was validated in this study by demonstrating why action and inaction occurred during the policy process.

This three-article dissertation demonstrates that social media use can impact mental health in many ways, and that policy efforts to increase government regulation on social media have and will most likely continue to face obstacles. These problems not only impact young social media users but leadership decisions that prioritize profits over health.

Future Research

These studies offered valuable insights for both public health professionals and policy experts, but additional research questions remain and gaps in the literature need to be addressed. Future studies should utilize automatic downloads of data from social media platforms. This would help with the various limitations described using survey instruments. Incorporating a mixed method research design would improve the overall quality of research by providing opportunities to evaluate and extend analyses. Furthermore, studying these associations across the lifespan would be invaluable. And lastly, research should focus efforts on specific areas of inquiry. For public health professionals, studies should integrate both the biological and technological factors across important lifespan stages that impact behavior in distinct ways.

Policy Recommendations

Policy experts may find this systematic summary of narratives describing the arguments for and against increased government regulation on social media beneficial for understanding strategies employed by opposing interests. Policies can either harm or benefit young people, communities, and society at large. When considering the arguments provided by various interests, it is important that policy decisions attempt to focus on the public interest.

There are some steps policy experts can begin to take in creating a healthy foundation to improve the safety and health of the social media experience. First, instead of focusing on efforts to create age verification systems, efforts should focus on creating policies that incorporate media literacy in educational and workplace environments.

Second, since we know about the importance of emotional support in relationships, it is important that social media algorithms be revised to focus when appropriate on empathy, caring, and maintaining/increasing emotional support, especially among vulnerable populations. Lukes notes that algorithms are sometimes inaccurate and can have built-in biases and significant effects that worsen the lives of already disadvantaged segments of the population (2021, 178).

And lastly, to combat exposure to dangerous content, federal government should enact legislation to involve specific agencies to restrict content that violates community standards. The current community standards on these platforms are not clearly defined and need to be changed immediately.

The content would need to have a clear definition of why it is considered harmful. For example, content that contains sexually explicit material, is violent in nature, and contains graphic scenes that involve harm to oneself or another human being is not acceptable and should be subject to fines and/or imprisonment. Content expressing personal experiences or opinions on various topics, such as vaccines and politics, should not be deemed harmful. There is a fine line between freedom of speech and content that shows harm to oneself or another human being. America was built on the concept of freedom and opportunity, and this foundation should be protected with health and safety being a priority. The decisions concerning social media will lay the foundation for future generations and the quality of society itself. Improving platforms and educating the public is a step in the right direction. In his discussion of platforms like Facebook,

Lukes says, “As we learn more about these operations from scholars and journalists, it is ever more urgent to render them visible and intelligible so that they can be regulated in ways that preserve people’s freedoms” (2021, 178).

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