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What You See is How You Feel: How Framing Shapes Emotions in the Wake of Collective Stressful Events

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UNIVERSITY OF CALIFORNIA,  
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What You See is How You Feel: How Framing Shapes Emotions in the Wake of Collective  
Stressful Events

DISSERTATION

submitted in partial satisfaction of the requirements  
for the degree of

DOCTOR OF PHILOSOPHY

in Psychological Science

by

Emma L. Grisham

Dissertation Committee:  
Distinguished Professor Roxane Cohen Silver, Chair  
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2022



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To the people who have been my colleagues, collaborators, cohort-mates, lab-mates, and, most importantly, friends – I cannot thank you enough for these past six years. I feel extraordinarily lucky to have landed in a graduate program with such incredible, brilliant, kind, and fun-loving people. To Alma Olaguez, Brett Mercier, Emily Slonecker, Jared Celniker, John Michael Kelly, Pasha Dashtgard, and the rest of my fabulous cohort-mates – thank you for the laughs, adventures, celebrations, and commiserations that defined my time here. I am so lucky to have been thrown into grad school with this exceptional group of people and I will always cherish the memories of our time together. To Rudy Medina, Mertcan Güngör, and Shiri Spitz – thank you for all the Monday nights spent playing (and occasionally winning!) trivia; our get-togethers were such a fun and welcome relief during a wild final year of grad school. Special thanks also to Becca Thompson, Nicky Jones, Josiah Sweeting, Kayley Estes, Adebisi Akinyemi, and the



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To my family (Mom, Dad, Ursula, Hannah) and friends (especially Alex Hattem) – thank you for the love, support, and encouragement, and for keeping me tethered to a world outside academia. You all grounded me when so much of my personal and professional world revolved around work, and I am so grateful to have had you all there believing in me, offering me healthy doses of perspective to keep me going, and reminding me of all the delights of life outside work.

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Last, but certainly not least, to Sean Goldy – it has been an unbelievable blessing to have you by my side (and along on the same ride) every step of the way for the past six years. You have been my single greatest support through this entire journey, and I am indescribably grateful that all my most memorable moments in grad school, highs and lows, have you in them. From the bottom of my heart, thank you for being my partner in work and life, and for the countless hours of counsel, advice, support, and being a quite literal captive audience for many, *many* practice talks (“Hi everyone”). These last six years have meant the world to me, and there's no one I would have rather spent them with than you.

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### EDUCATION

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- 2022            **Ph.D., Psychological Science**, University of California, Irvine (UCI)  
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- 2016            **B.S., Psychology**, University of Florida (UF)

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- 2022, 2021, 2019    UCI School of Social Ecology Undergraduate Mentoring Award
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Holman, E. A., & **Grisham, E. L.** (2020). When time falls apart: The public health implications of distorted time perception in the age of COVID-19. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(S1), S63-S65. <http://dx.doi.org/10.1037/tra0000756>

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**Grisham, E. L., Silver, R. C., & Holman, E. A.** (in preparation). When sharing is not caring: The emotional consequences of social sharing in the context of collective trauma.

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## **ABSTRACT OF THE DISSERTATION**

What You See is How You Feel: How Framing Shapes Emotions in the Wake of Collective Stressful Events

By

Emma L. Grisham

Doctor of Philosophy in Psychological Science

University of California, Irvine, 2022

Professor Roxane Cohen Silver, Chair

This dissertation examines how collective stressful events are framed and the implications of these framings for mental health outcomes. Prior research has found that people often frame the same events differently and that the way in which they frame an event can shape their emotional responses to it. The research herein builds on the extant literature by testing this relationship in the context of collective stressful and traumatic events, extending theoretical models to include broader subjectivist conceptualizations and adopting a text-based approach to studying event framing. Study 1 assessed framing of and responses to a national political event, the 2018 Judge Brett Kavanaugh-Dr. Christine Blasey Ford Senate Judiciary hearings. Using qualitative and quantitative data from a U.S. national sample, analyses explored how people framed this event, whether there were partisan differences in framing, and whether partisan framings were differentially related to acute stress responses following the hearings. Results suggest that Democrats and Republicans did view this event differently and that Republicans and individuals who adopted a Republican framing were less distressed by the event. Study 2 assessed the longitudinal relationship between event framing and general and event-related emotional responses to a mass violence event, the Boston Marathon bombings (BMB). Data from a U.S.

national sample were analyzed to examine how people framed this event at its one-year anniversary and whether those framings predicted BMB-related posttraumatic stress symptoms, general distress, and violence- and terrorism-related worry one year later. Regression analyses revealed that redemption-focused framing of the BMB was associated with lower BMB-related posttraumatic stress responses and that framing that blamed legal actors was related to greater posttraumatic stress and worry about future violence and terrorism. Study 3 explored how people framed an ongoing, chronic stressful event, the COVID-19 pandemic, as it unfolded and how those framings related to mental health over time. Framings were assessed by examining individuals' greatest pandemic-related worries in a national sample in the early days of the pandemic in the U.S. and linking them to responses over the next six months. Regression analyses revealed that several COVID-19-related worries were associated with concurrent and prospective mental health outcomes. Health-related framing was associated with greater COVID-19-related acute stress and general distress within the first month of the pandemic, economic framing was related to greater general distress within the first month, and scarcity framing was linked to general distress approximately six months later. The benefits of using a subjectivist, text-based approach for advancing knowledge and theory across all three studies are discussed.



## **CHAPTER 1:**

### **Introduction**

## Introduction

Over the last several decades, the mental health impact of collective stressful events on local, national, and global communities has been well documented and extensively investigated. When these natural (e.g., hurricane) and man-made (e.g., terrorist attack) disasters strike, they impact a large number of people who often exhibit adverse psychological responses in their wake, from general distress to psychiatric problems and impaired functioning (see Norris et al., 2002, for a review). The clinical implications of these events have been assessed in a variety of ways, often examining outcomes by characteristics of the event, like its duration (e.g., acute, chronic), type of event (e.g., natural disaster, mass violence, health crisis), type of exposure (e.g., direct, indirect), and timing (e.g., childhood, adulthood), and characteristics of the affected population (e.g., demographics, prior adverse experiences, mental health history). While these approaches have illuminated the ways in which objective aspects of collective stressful events and those who experience them can shape short- and long-term mental health outcomes, relatively less research has explored the subjective experience of these events and the role that perceptions play in post-event psychological responses.

### **Subjectivism in Social Psychology**

Historically, one of the defining features of social psychology has been its emphasis on perceptions of social situations as determinants of human cognition, affect, and behavior (Ross et al., 2010). Acknowledging that people often respond to and act on their construal of a situation, or subjective interpretation, rather than its objective qualities alone, represented a departure from the traditional stimulus-response model that failed to explain the great variability of responses to the same stimuli (Ross & Nisbett, 1991). Hastorf and Cantril's (1954) classic study demonstrated this phenomenon by illustrating how football fans from two rival universities viewed the same

game quite differently, with each side defending their own team's actions while excoriating the acts of their rival. Since this seminal work, the role of construal has been investigated in various intergroup contexts (e.g., partisans, Lord et al., 1979; ethnonational groups, Vallone et al., 1985) and in relation to behavioral outcomes (e.g., bystander intervention, Darley & Latané, 1968), but it has been most thoroughly explored and integrated into the study of emotion.

The notion that emotions are shaped by the personal and subjective meaning ascribed to situations has dominated the contemporary emotion literature (Frijda, 1993). While many cognitive theories of emotion have been proposed since their emergence in the 1960s, appraisal theories remain the most influential. Their shared central proposition is that people's emotions are based on the ways in which they evaluate a precipitating event (Oatley et al., 2011). These theories offer an explanation as to why the same event can elicit different emotional responses by linking differing perceptions of the event to distinct emotional responses (Moors et al., 2013). For example, events framed as out of one's control or as the loss of something pleasurable tend to evoke sadness, whereas events perceived as a source of unavoidable pain tend to elicit distress (Roseman et al., 1996; Siemer et al., 2007). These theories, and the body of empirical work testing them, provide support for the subjectivist perspective: The way in which people construe an event shapes their emotions.

### **Subjectivism in the Context of Stress and Coping**

Just as appraisal theories have been the prevailing theoretical framework in the mainstream social psychological emotion literature, they have also guided empirical work on psychological responses in the stress and coping context. The preeminent stress appraisal model contends that people respond to stressful events based on the subjective appraisals they make about them (Lazarus, 1966; Lazarus & Folkman, 1984). Consistent with mainstream appraisal

research, this work asserts that people can experience the same stressful event but appraise it very differently and these divergent appraisals, in turn, can explain the different psychological outcomes exhibited by those who experience the same event (Folkman et al., 1986; Folkman et al., 1986). Appraisals of stressful events can be categorized according to their alignment with a number of domains (e.g., harm/loss, challenge, coping ability, control; Folkman, 1984), but the most extensively investigated stress appraisals have been those that frame the event as a threat to one's well-being. Both correlational and experimental work has linked these stress appraisals to a variety of adverse health outcomes, including heightened psychological (Gaab et al., 2003) and physiological stress responses (cortisol: Gaab et al., 2005; heart rate: Johnston et al., 2016), increased negative affect and emotions (Finkelstein-Fox et al., 2019; Porter & Goolkasian, 2019), including anxiety and sadness (Weinstein et al., 2009), higher depressive symptoms (Mulvaney & Mebert, 2010), distress (Major et al., 1998), dampened subjective well-being (Kaniasty & Jakubowska, 2014), and greater persistence and severity of psychiatric symptoms (Spaccarelli, 1994) such as posttraumatic stress (Ehlers & Clark, 2000; Vaughan et al., 2016). While these findings span a diverse range of stressful contexts, this literature has primarily focused on individually-experienced stressors, with few studies exploring the emotional impact of appraisals for collective stressful events. Nonetheless, this body of theoretical and empirical work suggests that subjective perceptions of collective stressful events can powerfully shape emotional responses to them.

Considering the role of subjective perceptions may be particularly relevant in understanding emotional responses in the context of stressful events because of the unique qualities of these situations. Collective disasters are typically unpredictable and ambiguous, conditions that leave room for interpretation and foster feelings of uncertainty, uncontrollability,

and stress (Brosschot et al., 2016; Grupe & Nitschke, 2013; Rothbaum et al., 1982). To manage these aversive feelings, people often employ a variety of coping strategies, including cognitive appraisal, which involves reframing or reinterpreting the event to better align with preexisting beliefs and worldviews (Park, 2010). By bringing the event in line with their understanding of the world, people can make sense of these challenging experiences, thereby regaining a sense of control and greater acceptance (Pearlin & Schooler, 1978; Rothbaum et al., 1982). Indeed, despite the immediacy with which they are generated, these appraisals are not static; instead, they are flexible and readily change in response to the situation or other components of the emotion process (Moors et al., 2013; Park, 2010). Therefore, given the ambiguous nature of stressful events, the drive to cope with and regain mastery over them, and the dynamic appraisal and emotion process, collective stressful events are an ideal context in which to explore subjective perceptions of events and their relations with emotional responses and mental health outcomes.

While the extant literature on appraisals of stressful events provides crucial insight into the ways in which psychological responses are shaped by event perceptions, this body of work has primarily examined perceptions using specific types of event-neutral appraisals. These appraisal types include evaluations of threat and harm, personal control, coping abilities, agency, and goal relevance, among others, that can apply to perceptions of any event (Lazarus & Folkman, 1984; Roseman et al., 1996). The benefit of this approach is that its findings can more broadly generalize across different events and event types. However, exclusively examining these rich and nuanced construals along the narrow dimensions of specific appraisal types may exclude event-specific, contextual features of these perceptions that may play a critical role in shaping event-related emotional responses. For example, both a public health crisis and a mass

shooting could be appraised as threatening, and even threatening to the same extent, but the nature of these threats are quite different. During a mass shooting, the threat may be perceived as intense and imminent, whereas the threat of a health crisis may be construed as concealed and chronic. However, this phenomenological distinction would not be captured by simply assessing threat appraisals and this context could have meaningful implications for psychological outcomes in these two instances. Both event-neutral and event-specific approaches are essential to examine the breadth and depth of these stressful event construals and how they relate to psychological outcomes. Thus, to address this empirical gap, more work is needed that adopts this broader subjectivist approach that considers stressful event perceptions and construals beyond specific appraisal dimensions and the specific context of an event.

One possible explanation for the limited adoption of this broader approach is the limitation of the dominant methodology used in the study of these stressful event perceptions. Most work in this area uses closed-ended survey items to measure specific aspects of event perceptions, rather than open-ended questions to capture perceptions more holistically. While quantitative approaches are preferred within the field for ease of data analysis and inferential testing, qualitative methods may be better suited to assess the amount, variety, and depth of information that respondents can provide about the ways in which they perceive stressful events. Although in years past these methods may have been considered prohibitively time- and resource-intensive, recent technological advances have enabled the development of automated text analysis tools that have increased the accessibility of this approach (Boyd, 2017; Iliev et al., 2014; Ziemer & Korkmaz, 2017). Incorporating text analytic methods into the study of stressful event perceptions can facilitate empirical testing of a subjectivist approach and advance our understanding of the ways in which people naturally frame these events.

## **Text-Based Approaches to Study Stressful Events**

While text analytic methods have not yet been widely adopted to study framing of stressful events, other bodies of psychological work predominantly rely on text-based methods and their findings can inform empirical questions about perceptions of stressful events. For example, the narrative literature typically uses manual human coding of autobiographical accounts of various life experiences to explore the ways in which people construct their identities (Adler et al., 2017). These studies primarily seek to address questions about personality and the self but do so by examining key moments in individuals' lives, often including "low points" and distressing events such as the death of a loved one (e.g., Cox & McAdams, 2014). Work in this area has found that the way in which people frame challenging experiences is tied to psychological responses and mental health outcomes. Redemptive framing of life stories, in which an initially negative experience is later seen as positive, has been consistently linked with better mental health outcomes (see Adler et al., 2016, for a review). For example, people who framed their personal accounts of the September 11<sup>th</sup> terrorist attacks as redemptive reported greater psychological well-being, whereas those who framed the event as contaminated, or starting positive and turning negative, were more psychologically distressed (Adler & Poulin, 2009). Similarly, framing stressful experiences as integrated into one's life story is related to dampened event-related stress responses: a study of mothers of children with autism spectrum disorder showed that more integrated parenting narratives predicted lower parenting stress 18 months later (Mason et al., 2019). Although these and other narrative studies use text analysis to explore personality and identity development in accounts of individually-experienced stressful events, this work provides convergent evidence for the link between stressful event framing and

emotional responses and demonstrates the utility of this text-based method to examine that relationship.

In addition to the narrative literature, work on expressive writing has also explored responses to stressful life events using text data. Unlike narrative work's manual human coding method, expressive writing research typically uses a text analysis tool known as the Linguistic Inquiry and Word Counter (LIWC), which analyzes text for the mention of words included in validated dictionaries to capture psychological constructs (e.g., negative emotion; Pennebaker et al., 2003; Tausczik & Pennebaker, 2010). The expressive writing research primarily examines whether the act of writing about emotional experiences can promote better physical and mental health. However, some work has also explored how certain language use in these written expressions is associated with better psychological adjustment. For example, people whose written accounts of emotional experiences contained high positive emotion, moderate negative emotion, and a rise in cognitive processing over time, reported greater happiness and improved mood (Pennebaker & Seagal, 1999). In addition, narratives about traumatic experiences that contained more cognitive processing and less perceived threat predicted fewer posttraumatic stress symptoms six months later (Kleim et al., 2018). Despite their focus on responses to, rather than framing of, the event, these studies suggest that cognitive and emotional features of accounts of stressful events can have meaningful implications for mental health outcomes and that a dictionary-based approach may be an effective method by which to identify these characteristics.

The text analytic methods used in the narrative and expressive writing literatures represent the text-based approaches that have thus far been adopted to study framing of stressful events. However, natural language processing and machine learning techniques have recently



emerged as sophisticated computational tools that may also prove useful in psychological research and the study of mental health, offering a novel methodological avenue for this work (Chen & Wojcik, 2016; Shatte et al., 2019). Several studies have demonstrated the utility of these methods for studying framing, primarily in the media and political contexts. For example, content analyses of news articles about the 2014 Sony Pictures Entertainment hack revealed how the media framed coverage of this event, ranging from a focus on the information stolen to the political motivations of the culprits (Afful-Dadzie et al., 2016). Similarly, an analysis of tweets using these methods demonstrated partisan differences in the framing of mass shootings, with Republicans discussing the shooter and news updates and Democrats focusing on the victims and policies (Demszky et al., 2019). Findings from these studies suggest that, like manual coding and LIWC analyses, natural language processing tools may also be used to identify the ways in which people frame stressful events.

In sum, across disparate literatures, text analytic tools have emerged as invaluable methods for studying perceptions of, and responses to, stressful events. These bodies of work demonstrate the applicability of various analytic tools and illustrate the diversity of information that can be gleaned from text data about the ways in which people frame stressful events. Building on prior work, this dissertation advances the current understanding of stressful event framing and its association with mental health outcomes by adopting a multi-method, text-based approach that integrates findings and draws tools from various disciplines. By examining stressful event framing using text data, rather than solely using closed-ended survey items, this work can provide rich, nuanced information about the ways in which people naturally frame these experiences and account for greater variability in these perceptions.

## **Plan for the Dissertation**

This dissertation describes the results of three studies that used multiple text-based methods to examine event framing and emotional responses in the context of three distinct types of collective stressful events. Chapter 2 explores the role of event-relevant identities in shaping framings and how those framings are associated with psychological responses to a national political event: the 2018 Christine Blasey Ford-Brett Kavanaugh hearings. Chapter 3 assesses whether adaptive and maladaptive framings of a mass violence event, the Boston Marathon bombings, at the one-year anniversary predict subsequent mental health sequelae. Chapter 4 examines how framings of an ongoing public health crisis, the COVID-19 pandemic, shift over time and relate to acute and short-term distress. The theoretical and practical implications of this overall program of research are discussed in Chapter 5.

## References

- Adler, J. M., Dunlop, W. L., Fivush, R., Lilgendahl, J. P., Lodi-Smith, J., McAdams, D. P., McLean, K. C., Pasupathi, M., & Syed, M. (2017). Research methods for studying narrative identity: A primer. *Social Psychological and Personality Science*, *8*(5), 519–527. <https://doi.org/10.1177/1948550617698202>
- Adler, J. M., Lodi-Smith, J., Philippe, F. L., & Houle, I. (2016). The incremental validity of narrative identity in predicting well-being: A review of the field and recommendations for the future. *Personality and Social Psychology Review*, *20*(2), 142–175. <https://doi.org/10.1177/1088868315585068>
- Adler, J. M., & Poulin, M. J. (2009). The political is personal: Narrating 9/11 and psychological well-being. *Journal of Personality*, *77*(4), 903–932. <https://doi.org/10.1111/j.1467-6494.2009.00569.x>
- Afful-Dadzie, E., Nabareseh, S., Oplatkova, Z. K., & Klimek, P. (2016). Framing media coverage of the 2014 Sony Pictures Entertainment hack: A topic modelling approach. In *Proceedings of the 11<sup>th</sup> International Conference on Cyber Warfare and Security (ICCWS 2016)*.
- Boyd, R. L. (2017). Psychological text analysis in the digital humanities. In S. Hai-Jew (Ed.), *Data analytics in digital humanities* (pp. 161-189). Springer International Publishing.
- Brosschot, J. F., Verkuil, B., & Thayer, J. F. (2016). The default response to uncertainty and the importance of safety in anxiety and stress: An evolution-theoretical perspective. *Journal of Anxiety Disorders*, *41*, 22-34. <https://doi.org/10.1016/j.janxdis.2016.04.012>
- Chen, E. E., & Wojcik, S. P. (2016). A practical guide to big data research in psychology. *Psychological Methods*, *21*(4), 458–474. <https://doi.org/10.1037/met0000111>

- Cox, K., & McAdams, D. P. (2014). Meaning making during high and low point life story episodes predicts emotion regulation two years later: How the past informs the future. *Journal of Research in Personality, 50*, 66–70.  
<https://doi.org/10.1016/j.jrp.2014.03.004>
- Darley, J. M., & Latane, B. (1968). Bystander intervention in emergencies: Diffusion of responsibility. *Journal of Personality and Social Psychology, 8*(4, Pt.1), 377–383.  
<https://doi.org/10.1037/h0025589>
- Demszky, D., Garg, N., Voigt, R., Zou, J., Gentzkow, M., Shapiro, J., & Jurafsky, D. (2019). Analyzing polarization in social media: Method and application to tweets on 21 mass shootings. In *17<sup>th</sup> Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)*. <https://doi.org/10.48550/arXiv.1904.01596>
- Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy, 38*(4), 319–345. [https://doi.org/10.1016/s0005-7967\(99\)00123-0](https://doi.org/10.1016/s0005-7967(99)00123-0)
- Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology, 46*(4), 839–852.  
<https://doi.org/10.1037/0022-3514.46.4.839>
- Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J. (1986). Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology, 50*(5), 992–1003.  
<https://doi.org/10.1037/0022-3514.50.5.992>
- Folkman, S., Lazarus, R. S., Gruen, R. J., & DeLongis, A. (1986). Appraisal, coping, health status, and psychological symptoms. *Journal of Personality and Social Psychology, 50*(3), 571–579. <https://doi.org/10.1037/0022-3514.50.3.571>

- Frijda, N. H. (1993). The place of appraisal in emotion. *Cognition and Emotion*, 7, 357-387.  
<https://doi.org/10.1080/02699939308409193>
- Gaab, J., Blättler, N., Menzi, T., Pabst, B., Stoyer, S., & Ehlert, U. (2003). Randomized controlled evaluation of the effects of cognitive-behavioral stress management on cortisol responses to acute stress in healthy subjects. *Psychoneuroendocrinology*, 28(6), 767–779.  
[https://doi.org/10.1016/s0306-4530\(02\)00069-0](https://doi.org/10.1016/s0306-4530(02)00069-0)
- Gaab, J., Rohleder, N., Nater, U. M., & Ehlert, U. (2005). Psychological determinants of the cortisol stress response: The role of anticipatory cognitive appraisal. *Psychoneuroendocrinology*, 30(6), 599-610.  
<https://doi.org/10.1016/j.psyneuen.2005.02.001>
- Grupe, D. W., & Nitschke, J. B. (2013). Uncertainty and anticipation in anxiety: An integrated neurobiological and psychological perspective. *Nature Reviews Neuroscience*, 14(7), 488-501. <https://doi.org/10.1038/nrn3524>
- Hastorf, A. H., & Cantril, H. (1954). They saw a game; A case study. *The Journal of Abnormal and Social Psychology*, 49(1), 129–134. <https://doi.org/10.1037/h0057880>
- Iliev, R., Dehghani, M., & Sagi, E. (2014). Automated text analysis in psychology: Methods, applications, and future developments. *Language and Cognition*, 7(2), 265-290.  
<https://doi.org/10.1017/langcog.2014.30>
- Johnston, D., Bell, C., Jones, M., Farquharson, B., Allan, J., Schofield, P., Ricketts, I., & Johnston, M. (2016). Stressors, appraisal of stressors, experienced stress and cardiac response: A real-time, real-life investigation of work stress in nurses. *Annals of Behavioral Medicine*, 50(2), 187–197. <https://doi.org/10.1007/s12160-015-9746-8>

- Kaniasty, K., & Jakubowska, U. (2014). Can appraisals of common political life events impact subjective well-being? *Journal of Applied Social Psychology, 44*(12), 751-767.  
<https://doi.org/10.1111/jasp.12265>
- Kleim, B., Horn, A. B., Kraehenmann, R., Mehl, M. R., & Ehlers, A. (2018). Early linguistic markers of trauma-specific processing predict post-trauma adjustment. *Frontiers in Psychiatry, 9*, 645. <https://doi.org/10.3389/fpsy.2018.00645>
- Lazarus, R. S. (1966). *Psychological stress and the coping process*. McGraw-Hill.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer Publishing Company.
- Lord, C. G., Ross, L., & Lepper, M. R. (1979). Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology, 37*(11), 2098–2109. <https://doi.org/10.1037/0022-3514.37.11.2098>
- Major, B., Richards, C., Cooper, M. L., Cozzarelli, C., & Zubek, J. (1998). Personal resilience, cognitive appraisals, and coping: An integrative model of adjustment to abortion. *Journal of Personality and Social Psychology, 74*(3), 735–752. <https://doi.org/10.1037//0022-3514.74.3.735>
- Mason, A. E., Adler, J. M., Puterman, E., Lakmazaheri, A., Brucker, M., Aschbacher, K., & Epel, E. S. (2019). Stress resilience: Narrative identity may buffer the longitudinal effects of chronic caregiving stress on mental health and telomere shortening. *Brain, Behavior, and Immunity, 77*, 101–109. <https://doi.org/10.1016/j.bbi.2018.12.010>
- Moors, A., Ellsworth, P. C., Scherer, K. R., & Frijda, N. H. (2013). Appraisal theories of emotion: State of the art and future development. *Emotion Review, 5*(2), 119–124.  
<https://doi.org/10.1177/1754073912468165>

- Mulvaney, M. K., & Mebert, C. J. (2010). Stress appraisal and attitudes toward corporal punishment as intervening processes between corporal punishment and subsequent mental health. *Journal of Family Violence, 25*, 401–412. <https://doi.org/10.1007/s10896-009-9301-0>
- Norris, F. H., Friedman, M. J., Watson, P. J., Byrne, C. M., Diaz, E., & Kaniasty, K. (2002). 60,000 disaster victims speak: Part 1. An empirical review of the empirical literature, 1981-2001. *Psychiatry: Interpersonal and Biological Processes, 65*(3), 207–239. <https://doi.org/10.1521/psyc.65.3.207.20173>
- Oatley, K., Parrott, W. G., Smith, C., & Watts, F. (2011). Cognition and Emotion over twenty-five years. *Cognition & Emotion, 25*(8), 1341–1348. <https://doi.org/10.1080/02699931.2011.622949>
- Park, C. L. (2010). Making sense of the meaning literature: An integrative review of meaning making and its effects on adjustment to stressful life events. *Psychological Bulletin, 136*(2), 257–301. <https://doi.org/10.1037/a0018301>
- Pearlin, L. I., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior, 19*(1), 2–21. <https://doi.org/10.2307/2136319>
- Pennebaker, J. W., Mehl, M. R., & Niederhoffer, K. G. (2003). Psychological aspects of natural language use: Our words, our selves. *Annual Review of Psychology, 54*, 547–577. <https://doi.org/10.1146/annurev.psych.54.101601.145041>
- Pennebaker, J. W., & Seagal, J. D. (1999). Forming a story: The health benefits of narrative. *Journal of Clinical Psychology, 55*(10), 1243–1254. [https://doi.org/10.1002/\(SICI\)1097-4679\(199910\)55:10<1243::AID-JCLP6>3.0.CO;2-N](https://doi.org/10.1002/(SICI)1097-4679(199910)55:10<1243::AID-JCLP6>3.0.CO;2-N)

- Porter, A. M., & Goolkasian, P. (2019). Video games and stress: How stress appraisal and game content affect cardiovascular and emotion outcomes. *Frontiers in Psychology, 10*, 967. <https://doi.org/10.3389/fpsyg.2019.00967>
- Roseman, I. J., Antoniou, A. A., & Jose, P. E. (1996). Appraisal determinants of emotions: Constructing a more accurate and comprehensive theory. *Cognition and Emotion, 10*(3), 241–277. <https://doi.org/10.1080/026999396380240>
- Ross, L., Lepper, M., & Ward, A. (2010). History of social psychology: Insights, challenges, and contributions to theory and application. In S. T. Fiske, D. T. Gilbert, & G. Lindzey (Eds.), *Handbook of social psychology* (pp. 3–50). John Wiley & Sons Inc.
- Ross, L., & Nisbett, R. E. (1991). *The person and the situation: Perspectives of social psychology*. McGraw-Hill.
- Rothbaum, F., Weisz, J. R. & Snyder, S. S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology, 42*(1), 5–37. <https://doi.org/10.1037/0022-3514.42.1.5>
- Shatte, A. B., Hutchinson, D. M., & Teague, S. J. (2019). Machine learning in mental health: A scoping review of methods and applications. *Psychological Medicine, 49*(9), 1426–1448. <https://doi.org/10.1017/S0033291719000151>
- Siemer, M., Mauss, I., & Gross, J. J. Same situation–different emotions: How appraisals shape our emotions. *Emotion, 7*(3), 592–600. <https://doi.org/10.1037/1528-3542.7.3.592>
- Spaccarelli, S. (1994). Stress, appraisal, and coping in child sexual abuse: A theoretical and empirical review. *Psychological Bulletin, 116*(2), 340–362. <https://doi.org/10.1037/0033-2909.116.2.340>



- Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology, 29*(1), 24–54. <https://doi.org/10.1177/0261927X09351676>
- Vallone, R. P., Ross, L., & Lepper, M. R. (1985). The hostile media phenomenon: Biased perception and perceptions of media bias in coverage of the Beirut massacre. *Journal of Personality and Social Psychology, 49*(3), 577–585. <https://doi.org/10.1037/0022-3514.49.3.577>
- Vaughan, C. A., Miles, J. N., Eisenman, D. P., & Meredith, L. S. (2016). Longitudinal associations among pain, posttraumatic stress disorder symptoms, and stress appraisals. *Journal of Traumatic Stress, 29*(2), 176–179. <https://doi.org/10.1002/jts.22083>
- Weinstein, N., Brown, K. W., & Ryan, R. M. (2009). A multi-method examination of the effects of mindfulness on stress attribution, coping, and emotional well-being. *Journal of Research in Personality, 43*(3), 374–385. <https://doi.org/j.jrp.2008.12.008>
- Ziemer, K. S., & Korkmaz, G. (2017). Using text to predict psychological and physical health: A comparison of human rater and computerized text analysis. *Computers in Human Behavior, 76*, 122-127. <https://doi.org/10.1016/j.chb.2017.06.038>

## **CHAPTER 2:**

### **They Saw a Hearing: Democrats' and Republicans' Perceptions of and Responses to the Kavanaugh-Ford Hearings<sup>1</sup>**

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<sup>1</sup> This chapter has been formatted to be submitted to an academic journal. I would like to thank my coauthors for their contributions to this manuscript.  
Grisham, E. L., Dashtgard, P., Relihan, D. P., Holman, E. A., & Silver, R. C. (In Preparation). They saw a hearing: Democrats' and Republicans' perceptions of and responses to the Ford-Kavanaugh hearings.

## Abstract

In several highly publicized hearings in September 2018, Dr. Christine Blasey-Ford and Judge Brett Kavanaugh presented two opposing accounts of an alleged sexual assault. In the wake of these proceedings, partisans appeared similarly divided in how they regarded this political event. Using a national sample of Americans ( $N = 2,377$ ) and a mixed-methods design, we investigated partisans' perceptions of, and responses to, the Ford-Kavanaugh hearings. Respondents reported their views of the hearings soon after they occurred; we used topic modeling to analyze these responses and found uniquely partisan topics emerged, including judicial impartiality and due process. Acute stress (AS) responses to the hearings were also related to partisan identities and perceptions; both Republicans (IRR = 0.81, 95% CI, 0.78, 0.84) and individuals who wrote more about Republican topics (IRR = 0.72, 95% CI, 0.56, 0.92) reported lower AS than their Democratic counterparts. Results demonstrate politically motivated perception with implications for mental health outcomes.

*Keywords:* Ford-Kavanaugh hearings, politics, motivated perception, acute stress

They saw a hearing: Democrats' and Republicans' perceptions of and responses to the  
Kavanaugh-Ford Hearings

On September 27, 2018, Dr. Christine Blasey-Ford and Judge Brett Kavanaugh appeared before the United States Senate Judiciary Committee to testify regarding Ford's allegations that Kavanaugh sexually assaulted her in high school. More than 20 million viewers tuned into broadcasts of this landmark event, which came at a critical cultural juncture, as the U.S. grappled with unprecedented political polarization and animosity, shifting norms and ongoing national conversations about sexual violence in the wake of the MeToo movement, and a looming midterm election in a fraught political climate (Pew Research Center, 2014, 2016, 2018; Richwine, 2018).

Although billed as an impartial investigation of the facts, the Ford-Kavanaugh proceedings were instead a display of adversarial partisanship (Ellis, 2018). In his opening statement, Judge Kavanaugh proclaimed his innocence and accused Democrats of using the allegations to discredit him (Shabad, 2018). Republican politicians echoed these charges and claimed Democrats strategically waited until the eleventh hour to bring forth the allegations (Kirby, 2018). Democrats, in turn, condemned Kavanaugh's comportment during his testimony and accused Republicans of undermining the FBI investigation into the allegations (Breuninger, 2018; Relman, 2018). Although politicians on both sides of the aisle witnessed the same events, they appeared to interpret the situation in fundamentally different ways, according to the interests of their respective parties.

Perceiving intergroup situations through the lens of group affiliation is a well-established psychological phenomenon, dating back to the classic study of football fans who saw dramatically different versions of the same rivalry game (Hastorf & Cantril, 1954). This identity-

motivated perception has been best understood within the framework of social identity theory, which argues that individuals derive their self-concepts in part from their membership in social groups and are fundamentally motivated to maintain a positive social identity as part of their need for a positive self-concept (Tajfel & Turner, 1979). Of the strategies used to uphold favorable sentiments about social identities, perceptual biases may be most likely to inspire division, given the challenge of finding common ground without first sharing a common reality (Stern & Ondish, 2018; Turner et al., 1994; Van Bavel & Pereira, 2018; Xiao et al., 2016). In a time of political tribalism and sectarianism (Finkel et al., 2020), disagreement over the basic facts of an event could thwart bipartisan compromise and further entrench partisan divisions.

Despite limited empirical work examining identity-motivated perception among partisans, preliminary evidence suggests that partisans construe actions or events in ways that affirm their groups' worldviews. For example, people label identical political acts differently depending on the identity of the actor; what is considered "legitimate political discourse" (Dawsey & Sonmez, 2022) when committed by a member of one's own faction becomes terrorism when performed by an opponent (Shamir & Shikaki, 2002). Moreover, people attribute motives and assign blame for political tragedies along ideological lines, offering exculpatory explanations for actors with whom they are politically aligned (Hulsizer et al., 2004; Noor, Kteily et al., 2019). While this work has demonstrated partisan differences in perceptions of real-world events, its quantitative design limits the variety and richness of information that is provided. To address this methodological limitation, researchers have increasingly adopted narrative and text analytic approaches to examine partisans' organic perceptions of political events. For example, partisans' written reactions to learning the 2016 Presidential election results reflected divergent responses: Clinton supporters expressed dread and despair and Trump

supporters described triumph, hope, and redemption (Dunlop et al., 2018). Similarly, an analysis of Twitter data on mass shootings found that partisans focused on aspects of the events that aligned with their party's platform; Republicans concentrated more on the shooter and news updates whereas Democrats centered the victims and advocated for policy changes (Demszky et al., 2019). Using text-based approaches, these studies have provided deeper insight into how partisans naturally frame political events, finding convergent evidence that they perceive these situations through the lens of their political identities.

Prior work demonstrates partisans' identity-motivated interpretations, but no work has yet addressed whether adopting identity-consistent narratives corresponds with divergent mental health responses to these significant events, despite research suggesting this link. Partisans have shown changes in physical and mental well-being in the aftermath of major political events: following U.S. presidential elections, supporters of the losing candidate experienced elevated levels of the stress hormone cortisol in the ensuing days and diminished subjective well-being and happiness for up to six months (Hoyt et al., 2018; Lench et al., 2019; Stanton et al., 2010). Furthermore, research suggests that people's narratives about political events can predict their psychological well-being in the aftermath (Adler & Poulin, 2009). Given the drive to maintain positive views of one's ingroup and view political events in an identity-consistent manner, and the significance of political outcomes for partisans, we believe stronger identification with political parties and their partisan narratives partially explains the resilience of victors, and distress of losers, following political contests.

Building on this prior work, the present study examined how partisans viewed the Ford-Kavanaugh hearings among a U.S. national sample in the days following the hearings up until the confirmation vote. Using a mixed-methods design and natural language processing, we

identified topics emerging from text responses recorded as these events unfolded, investigated whether there were partisan differences in topic use, and tested whether engagement in partisan topics was related to psychological responses to the event above and beyond partisanship. We hypothesized that Democrats and Republicans would focus on topics that most aligned with their party's position to oppose and support Kavanaugh's confirmation, respectively, and that individuals who endorsed more of the winning Republican, and fewer of the losing Democratic, topics would be less distressed by the event. The study and analyses reported were not preregistered. The data and analytic code will be made available on a permanent third-party archive upon publication.

## **Method**

### **Design and Data Collection**

To examine American adults' perceptions of and responses to the Ford-Kavanaugh hearings, a representative national sample was drawn from NORC's AmeriSpeak Panel, which uses address-based probability sampling to recruit individuals within U.S. households. Participants were Web-enabled panelists who were invited to complete a confidential, self-administered online survey starting five days following the Ford-Kavanaugh hearings between October 2 and October 12, 2018. The full sample contained 4,894 individuals (59.4% completion rate) who were compensated for their participation with credits to be redeemed for gift cards. Due to the political nature of the event being studied, Republicans were oversampled to ensure adequate representation and numbers for comparison. All procedures for this study were approved by the Institutional Review Board of the University of California, Irvine.

### **Measures**

#### ***Acute Stress (AS) Response to the Ford-Kavanaugh News Story***

Acute stress responses related to the Ford-Kavanaugh news story were assessed using the Primary Care PTSD Screen for DSM-5 (PC-PTSD-5; Prins et al., 2015), which was modified to allow responses from 1 (*never*) to 5 (*all the time*) to describe how often they experienced five acute stress symptoms “as a result of the Judge Kavanaugh-Dr. Ford news story.” Items were recoded to 0-4 to transform the lowest possible score (representing a total lack of symptoms) from a five to a “true zero” for analytic purposes. Ratings were summed and ranged from 0 to 20.

### ***Thoughts on Ford-Kavanaugh News Story***

After completing the closed-ended survey items, participants were asked if they had anything that they would like to share about their reaction to the Ford-Kavanaugh news story and were provided with an unlimited text box in which they could write as much or as little as they wished. Those participants who responded to this item with an open-ended response were included in the analyses reported in this paper.

### ***Demographics and Political Party Affiliation***

Upon entry into the AmeriSpeak panel and prior to data collection for the current study, participants reported demographic information, including age, gender, ethnicity, education level, and income, along with political party affiliation. Participants indicated their political party affiliation on a 7-point Likert type scale ranging from 1 (*Strong Democrat*) to 7 (*Strong Republican*) with a midpoint that representing no affiliation (*Don't Lean/Independent/None*).

### ***Timing of Survey Completion***

Because data were collected as events around the Ford-Kavanaugh hearings and confirmation process were unfolding, survey timing completion was included as a covariate in the model to account for variations in perceptions of and responses to the event as Kavanaugh's confirmation shifted from a possibility to a reality (e.g., Laurin, 2018). Participants were



dichotomously coded based on whether they completed the survey prior to the Senate cloture vote on October 5, 2018 (0) or following the Senate confirmation vote on October 6, 2018 (1).

### ***Media Exposure Related to the Ford-Kavanaugh Hearings***

Given prior work documenting media exposure as a powerful predictor of distress (e.g., Holman et al., 2014), we measured media exposure to control for this variance and assess the extent of respondents' indirect exposure to this event. Participants reported the average number of hours per day over the prior week they spent consuming media related to the Ford-Kavanaugh news story from five different sources (TV, radio or podcasts, online news sources, updates on social media, print news sources). Ratings for each source were made on a 13-point scale (1 = 0 hours to 13 = 11+ hours), and then summed across all items. Outliers (1.4%) were capped at 3 SDs above the mean, with a range of 0 to 26.

### ***Sexual and/or Interpersonal Violence (SIV)***

Because hearing others' personal accounts of sexual and interpersonal violence can be distressing to survivors of sexual and/or interpersonal violence (SIV; Dworkin et al., 2014), we included SIV in our model as a covariate. To assess prior experience with sexual and/or interpersonal violence, respondents were asked to indicate whether they had experienced sexual assault ("Has anyone ever touched or felt private areas of your body under force or threat or forced you to touch or feel someone else's private areas?"), rape ("Have you ever had sexual relations under force or threat?"), and intimate partner violence ("Have you ever been hit or pushed by a partner or spouse?"). Occurrences of each experience were dummy-coded and summed, with scores ranging from 0 to 3.

### **Qualitative Analysis**

To examine the text responses for partisan differences in perception and framing, we combined natural language processing techniques with standard thematic analytic methods. We conducted a form of unsupervised topic modeling known as latent Dirichlet allocation (LDA) to identify the central themes from the entire corpus of text responses. LDA is a cluster analytic approach that examines similarities and differences in word distributions to generate latent topics (Chen & Wojcik, 2016). After the topics are produced, each text response, referred to as a document, is assigned a value indicating the probability that each document belongs to each of the topics (Kosinski, Wang, Lakkaraju, & Leskovec, 2016). The number of topics produced by these unsupervised models must be specified by the researcher prior to analysis. To determine the number of topics for our model, two human coders reviewed a random subset of the text responses to identify and count how many major themes emerged. Data-driven, rather than theory-driven, fields traditionally rely on model fit statistics to select the number of topics that yield the best fitting model, but this method tends to yield models with unwieldy numbers of topics (e.g., 70), limiting its interpretability and practical utility (see Kosinski et al., 2016). Therefore, we developed this novel approach to avoid this issue and to incorporate more theory-driven practices to guide this data-driven method.

### ***Thematic Analysis***

To determine a numeric range of topics to specify in our unsupervised topic model, we conducted a thematic analysis on a portion of the open-ended responses. Following practices prescribed by grounded theory (Corbin & Strauss, 1990), two researchers independently read a randomly selected subset of 300 open-ended responses (150 responses from Democrats and Republicans, respectively) and compiled a list of major themes that emerged among each party. The researchers then compared their respective lists and jointly agreed upon a final set of 11

themes that best represented different topics that arose in response to the Ford-Kavanaugh hearings. However, because the coders recognized that there were several ways that the themes could be recategorized (i.e., by combining subordinate or dividing superordinate themes), we decided to test models with a range of 10 to 14 topics to account for these possible alternate structures.

### ***Topic Modeling***

After performing standard text preprocessing procedures (e.g., remove punctuation), data were manipulated using the tidytext package and analyzed using the topicmodels package in R (Grün & Hornik, 2011; Silge & Robinson, 2016). Based on the results from the theme extraction, we created 5 topic models with a range of 10 to 14 topics (one model for each number of topics), the output of which were then independently reviewed by three researchers to select the best model and label each topic in that model, in accordance with standard model selection practices (Sangalang et al., 2019). Once the researchers completed this process, they jointly discussed their respective results and collaboratively agreed upon the final model and its respective topic labels. In this case, the researchers selected the 13-topic model as the most coherent and meaningful. All topics were discussed and collectively labeled; when topic output was too ambiguous to label with the model results alone, the researchers reviewed the top ten most representative text responses for that topic to better determine the most appropriate label, which is a practice used in previous research (Sangalang et al., 2019).

### **Analytic Strategy**

Analyses were conducted using Stata Version 14.2 (College Station, TX). We first examined whether Democrats and Republicans focused on different topics when discussing the Ford-Kavanaugh hearings. After the researchers agreed upon the final topic model and labels for

all its topics, thirteen Mood's median tests with Bonferroni-corrected significance thresholds were performed to identify partisan topics – that is, topics that were used more by Democrats than Republicans or vice versa. This nonparametric test was chosen because the topic usage data were highly skewed and, thus, violated the normality assumption of traditional parametric tests. Given that these analyses compared topic usage among participants who identified as either Democrats or Republicans, participants who indicated no affiliation with either political party ( $n = 321$ ) were not included in these analyses. Once partisan topics were identified, topic modeling probability scores were then summed for Democratic and Republican topics, respectively, as appropriate. Next, a negative binomial regression model was used to test whether partisan construals of the Ford-Kavanaugh events were related to acute stress responses above and beyond partisanship. This statistical approach is appropriate when analyzing data that are highly positively skewed with a high prevalence of zero values, as were the scores for our outcome variable, acute stress (Green, 2021). Covariates included age, gender, ethnicity, income, education, media exposure related to the Ford-Kavanaugh hearings, personal history of sexual and/or interpersonal violence, and timing of survey completion (i.e., before or after the confirmation vote).

## **Results**

### **Current Sample**

Of the 4,894 participants in the full sample, roughly half ( $n = 2,474$ ) provided optional open-ended responses and thus qualified for the present study. To assess whether and how participants who chose to respond to the open-ended question differed from those who did not, a multiple logistic regression using sample weights compared responders to nonresponders ( $n = 2,420$ ) on demographics, exposure to media coverage of the hearings, previous history of sexual









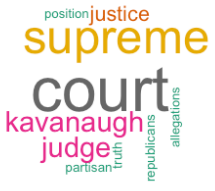


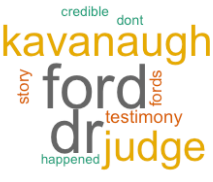

and/or interpersonal violence, and acute stress. Results indicated that participants in the present study did not differ from excluded individuals in terms of gender, political party affiliation, or acute stress. However, individuals included in the sample comprised proportionately fewer African Americans (OR [odds ratio] = .70,  $p = .016$ ), and were older (OR = 1.03,  $p < .001$ ), wealthier (OR = 1.04,  $p = .001$ ), more educated (OR = 1.31,  $p = .002$ ), consumed more media coverage about the Ford-Kavanaugh news story (OR = 1.06,  $p < .001$ ), and reported experiencing more sexual and/or interpersonal violence (OR = 1.23,  $p < .001$ ) than non-responders.

The final subsample included in the current study was limited to respondents who provided open-ended responses and completed the survey either before or after the Senate cloture and confirmation votes. A small number of participants ( $n = 97$ ) completed the survey between these two votes and were excluded from analyses because of the low statistical power of this small subgroup and limited interpretability of results from underpowered analyses (Button et al., 2013). The final sample ( $N = 2,377$ ) was 49.8% female, ranged in age from 19 to 90 ( $M = 53.64$ ,  $SD = 16.34$ ), and was 72.78% non-Hispanic White, 8.83% non-Hispanic Black, 11.11% Hispanic, and 7.28% other non-Hispanic ethnicities. About 57% were married, 50.44% had at least some college education, and 56.21% had an annual income of \$60,000 or more. Almost 60% of the sample was currently employed, either as a paid employee or self-employed. Participants were roughly evenly divided between Democrats (45.01%) and Republicans (42.03%), with a small percentage identifying with neither party or as Independents (12.96%). Participants reported exposure to an average of 7.72 ( $SD = 5.46$ ) hours of Ford-Kavanaugh coverage per day. About 52% of the sample had experienced at least one instance of sexual and/or personal violence, with 11.02% reporting up to 3 experiences.

## Topic Modeling Results

The output and labels for the 13-topic model are presented in Figure 1, presented in the form of wordclouds. The topics covered a diverse array of issues, capturing the multifaceted nature of this event. Many topics appeared to align with Kavanaugh's position, defending the allegations against Kavanaugh as politically motivated (topic 8) and directly questioning aspects of Ford's testimony, such as her credibility (topic 13), memory (topic 7), and timing for bringing these allegations forward now after all these years (topic 9). Only one topic portrayed the opposite position and directly criticized Kavanaugh by emphasizing his emotionality and allegedly false statements (topic 4). In addition to the emphasis on Ford and Kavanaugh specifically, many topics addressed other political actors as well. Some topics spoke of politicians on both sides, acknowledging President Trump's involvement as Kavanaugh's nominator (topic 2) and Democrats as the original presenters of these allegations (topic 10). There were also topics discussing various aspects of the political process itself, from the politicization of the purportedly apolitical judicial branch (topic 5), the presumption of innocence and need for corroborating evidence (topic 11), and the limited scope of the FBI investigation (topic 12) to the general media spectacle that these events precipitated (topic 1). Finally, two topics focused primarily on the sexual nature of the allegations, centering the issue of sexual assault (topic 3) and its victims who tend to primarily be women (topic 6).

Figure 1. Topic Model Output

#	Topic label	Wordcloud	#	Topic label	Wordcloud
1	Media spectacle		8	Defending Kavanaugh	
2	Focus on Republicans		9	Timing of event & allegations	
3	Sexual assault		10	Focus on Democrats	
4	Kavanaugh's conduct		11	Due process & burden of proof	
5	Supreme Court's impartiality		12	How the process was handled	
6	Victims of assault		13	Ford's credibility	
7	Ford's testimony & memory				

## Identification of Partisan Topics

The results of the Mood's median tests and topic classifications can be found in Table 1. Of the 13 topics, 5 were identified as more prevalent in one partisan group than the other: 1 topic was used primarily by Democrats ( $\phi = .15$ ) and 4 topics were used primarily by Republicans ( $\phi = .07-.13$ ). The Democratic topic concerned the Supreme Court's impartiality (topic 5) while the Republican topics were focused on the media spectacle of the hearings (topic 1), the timing of the alleged assault and of when the allegations were brought forward (topic 9), the Democrats' involvement in this event (topic 10), and issues regarding due process and burden of proof (topic 11). Thus, consistent with our hypotheses, Democrats and Republicans were more likely to endorse topics that related to their political group's interests. Compared to Republicans, Democrats wrote more about the politicization of the Supreme Court, which served as an argument against Kavanaugh's appointment. Conversely, Republicans were more likely to provide responses that defended Kavanaugh's nomination by questioning Ford's allegations, criticizing the Democrats, and emphasizing the importance of due process and corroborating evidence when considering accusations of this nature.



Table 1. Mood's Median Test Results and Topic Classifications by Partisanship Use

#	Topic label	Democrat <i>Mdn</i> ( <i>n</i> = 1,070)	Republican <i>Mdn</i> ( <i>n</i> = 999)	$\chi^2$	<i>p</i>	Partisan grouping
1	Media spectacle	0.016	0.018	8.81*	0.003	Republican
2	Focus on Republicans	0.016	0.013	2.11	0.147	-
3	Sexual assault	0.016	0.016	0.11	0.744	-
4	Kavanaugh's conduct	0.016	0.013	6.09	0.014	-
5	Supreme Court's impartiality	0.023	0.013	45.02*	<0.001	Democratic
6	Victims of assault	0.013	0.013	2.05	0.153	-
7	Ford's testimony & memory	0.016	0.016	0.11	0.742	-
8	Defending Kavanaugh	0.013	0.016	5.13	0.024	-
9	Timing of events & allegations	0.013	0.018	19.16*	<0.001	Republican
10	Focus on Democrats	0.013	0.018	17.65*	<0.001	Republican
11	Due process & burden of proof	0.013	0.023	36.59*	<0.001	Republican
12	Handling of the process	0.013	0.013	1.36	0.243	-
13	Ford's credibility	0.023	0.030	4.74	0.029	-

\*Significant at Bonferroni-adjusted *p*-value of .004. *df* = 1 for all tests.

### Predictors of Acute Stress

The results for the negative binomial regression model can be found in Table 2. Consistent with prior work (e.g., Lench et al., 2019), partisanship was significantly associated with acute stress responses to the Ford-Kavanaugh hearings; Democrats reported more distress in response to the Ford-Kavanaugh hearings than did Republicans (IRR = 0.81, 95% CI = 0.78-0.84, *p* < 0.001, Cohen's *d* = -0.12). Also as predicted, we found that participants who wrote more using Republican topics had lower rates of acute stress, regardless of their party affiliation (IRR = 0.72, 95% CI = 0.56-0.92, *p* = 0.009, Cohen's *d* = -0.17). However, Democratic topic use was not significantly associated with acute stress responses above and beyond partisanship and Republican topic use (IRR = 0.94, 95% CI = 0.65-1.34, *p* = 0.72, Cohen's *d* = -0.04).

Table 2. Negative Binomial Regression Model Predicting Acute Stress ( $N = 2,377$ )

Predictors	IRR (95% CI)	$z$	$p$
Survey completion timing (1 = After)	1.03 (0.90, 1.18)	0.48	0.629
Age	0.99 (0.99, 1.00)**	-2.82	0.005
Gender (1 = Female)	1.19 (1.03, 1.37)*	2.39	0.017
Ethnicity			
Black	1.01 (0.80, 1.27)	0.08	0.939
Hispanic	1.21 (0.98, 1.49)	1.80	0.072
Other	1.16 (0.90, 1.48)	1.13	0.257
College education	1.01 (0.88, 1.17)	0.18	0.859
Income	0.97 (0.96, 0.99)**	-3.20	0.001
Media exposure	1.04 (1.03, 1.05)***	6.71	<0.001
Sexual and/or interpersonal violence	1.50 (1.40, 1.61)***	11.47	<0.001
Party affiliation	0.81 (0.78, 0.84)***	-11.33	<0.001
Democratic topic use	0.94 (0.65, 1.34)	-0.36	0.721
Republican topic use	0.72 (0.56, 0.92)**	-2.60	0.009

Note. IRR = incidence rate ratios. CI = confidence intervals. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

## Discussion

Using a mixed-methods design, text analysis machine learning techniques, and data from a national sample, we found that partisans viewed the same political event in divergent, but identity-consistent, ways. Democrats emphasized judicial impartiality whereas Republicans focused on the role of Democrats and the media, the timing of the alleged assault and publicization, and due process and the burden of proof. These divergent perspectives of the same event demonstrate the role of partisan identities in shaping construal of real-world political events, consistent with related emerging work on partisan bias in basic sensory perception and information processing (Demszky et al., 2019; Van Bavel & Pereira, 2018; Xiao et al., 2016).

We also found that psychological responses to the hearings were related to both partisanship and partisan narratives. Democrats reported higher levels of event-related acute stress than did Republicans, a finding consistent with prior work showing that partisans experience adverse psychological responses following political outcomes that disfavored their ingroup (Hoyt et al., 2018; Lench et al., 2019; Stanton et al., 2010). Moreover, partisan topic

usage was related to distress about the hearings; regardless of their partisan identity, individuals who focused on topics disproportionately used by Republicans experienced lower levels of acute stress related to this political event, compared to those who referenced fewer Republican topics. These findings provide initial support for the link between identity-motivated perceptions and mental health outcomes, suggesting that, not only can belonging to the winning political group be protective against adverse psychological consequences, but so can adopting the political winners' narrative, regardless of one's political affiliation.

### **Limitations**

Despite our large national sample and integrative statistical approach, we acknowledge several limitations. Although Republican topic use was significantly linked to acute stress responses, the effect was relatively small compared to the association between partisanship and acute stress. We suspect that this small effect may be the result of the limited ability of automated text analysis methods to detect shared latent meaning across dissimilar wordings. Therefore, despite the advantage of its speed and processing power, this approach may have failed to fully capture mention of themes and thereby lowered statistical power.

This statistical limitation may also explain why Democratic topic use was not significantly associated with psychological distress. Comprised of only one topic (see Table 1), Democratic topic use may have lacked the precision and statistical power for a relationship to be detected with distress, especially above and beyond the more robust Republican topic use that combined four topics. Future studies should integrate these machine learning techniques with more traditional text analytic strategies to balance methodological tradeoffs.

Although we identified five partisan topics, there were no significant differences between Democrats and Republicans in the use of the remaining eight topics. This finding could suggest

that partisans' perceptions were more similar than different; however, an alternative explanation is that partisans discussed the same topics in different ways or that partisans referenced their opponent's positions, which are levels of nuance not easily detected by automated methods. Given these plausible explanations, we advise caution in interpreting these null results and encourage future work to explore how partisans differentially discuss the same topics.

Finally, we acknowledge the limited generalizability of the current study. Our subsample is a self-selected group of respondents who provided text responses, drawn from a representative national sample, so it is not itself representative of American adults. Furthermore, this study only examined motivated perception in the context of a single U.S. political event. To better understand the implications of these findings for contexts beyond the Ford-Kavanaugh hearings, these issues should be examined in the context of other political events.

### **Implications and Future Directions**

This study provides evidence for partisan-motivated perceptions of a major political event and the link between partisan narratives and event-related emotional responses. These findings add to an understudied but growing literature illustrating how partisanship and other social identities may shape how individuals process and respond to information about their social environments (e.g., Xiao et al., 2016). The extant literature has largely focused on partisan bias in higher-order cognitive processes (e.g., motivated reasoning), but accumulating evidence finds that partisanship may also shape the basic perceptions on which this complex processing relies (e.g., vision; Van Bavel & Pereira, 2018). Politically motivated perceptions may significantly challenge bipartisanship; if partisans cannot agree on the facts, then they are unlikely to interpret those facts similarly, much less to agree on a solution. By deepening our understanding of politically motivated perception, future research on this phenomenon may ultimately aid efforts

to combat political polarization by identifying factors that support and/or obstruct the development of a shared bipartisan reality.

Future studies should also examine factors that compound or reinforce politically motivated perceptions. Research on political communication suggests that engagement with the news media may be one such factor, given its key role in shaping and disseminating political narratives; editorial choices by media outlets on how to cover an event and weave a cohesive story result in framing the event in ways that audiences can adopt (e.g., Iyengar & Kinder, 1987). By tailoring their messaging to align with the political leanings of their audiences, outlets may contribute to divergent political perceptions by producing or reiterating partisan narratives. Therefore, future research should explore the news media's role in driving politically motivated perceptions as well as its potential consequences for mental health, given the known link between media exposure and event-related distress (e.g., Holman et al., 2014).

Lastly, the present study is to the first to our knowledge to link politically motivated perception to mental health outcomes. Our findings demonstrate that partisan perceptions of a real-world political event are associated with distress; in a society where contemporary events, such as mass shootings, the COVID-19 pandemic, and climate-related natural disasters, are increasingly politicized, adhering to a political take on these events could contribute to a cycle of worsening mental health as these events continue to occur. Future research should further elucidate the role of politically motivated perception in exacerbating or attenuating stress in the face of these increasingly politicized threats. Greater understanding of the partisan perception-mental health link could inform interventions designed to ameliorate psychological maladjustment following future politicized events.

## References

- Breuninger, K. (2018, September 28). *Democratic Sen. Diane Feinstein attacks Brett Kavanaugh's temperament after his 'belligerent' testimony*. CNBC.  
<https://www.cnbc.com/2018/09/28/sen-dianne-feinstein-rips-brett-kavanaughs-belligerent-testimony.html>
- Button, K. S., Ioannidis, J. P. A., Mokrysz, C., Nosek, B. A., Flint, J., Robinson, E. S. J., & Munafò, M. R. (2013). Power failure: Why small sample size undermines the reliability of neuroscience. *Nature Reviews Neuroscience*, *14*(5), 365-376.  
<https://doi.org/10.1038/nrn3457>
- Chen, E. E., & Wojcik, S. P. (2016). A practical guide to big data research in psychology. *Psychological Methods*, *21*(4), 458-474. <https://doi.org/10.1037/met0000111>
- Corbin, J., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, *13*(1), 3-21. <https://doi.org/10.1007/BF00988593>
- Dawsey, J., & Sonmez, F. (2022, February 3). RNC votes to condemn Cheney, Kinzinger for serving on House committee investigating Jan. 6 attack on the Capitol by pro-Trump mob. *Washington Post*. [https://www.washingtonpost.com/nation/2022/02/03/rnc-cheney-trump/?itid=ap\\_joshdawsey](https://www.washingtonpost.com/nation/2022/02/03/rnc-cheney-trump/?itid=ap_joshdawsey)
- Demszky, D., Garg, N., Voigt, R., Zou, J., Gentzkow, M., Shapiro, J., & Jurafsky, D. (2019). Analyzing polarization in social media: Method and application to tweets on 21 mass shootings. In *17<sup>th</sup> Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)*. <http://dx.doi.org/10.18653/v1/N19-1304>

- Dworkin, E. R., Sorell, N. R., & Allen, N. E. (2014). Individual- and setting-level correlates of secondary traumatic stress in rape crisis center staff. *Journal of Interpersonal Violence*, 31(4), 743-752. <https://doi.org/10.1177/0886260514556111>
- Dunlop, W. L., Harake, N., & Wilkinson, D. (2018). The cultural psychology of Clinton and Trump supporters: A narrative approach. *Social Psychological and Personality Science*, 9(2), 193-204. <https://doi.org/10.1177/1948550617732611>
- Ellis, E. G. (2018, September 27). *Blasey Ford-Kavanaugh testimony tells a tale of two internets*. Wired. <https://www.wired.com/story/blasey-ford-kavanaugh-filter-bubbles/>
- Finkel, E. J., Bail, C. A., Cikara, M., Ditto, P. H., Iyengar, S., Klar, S., ... & Druckman, J. N. (2020). Political sectarianism in America. *Science*, 370(6516), 533-536. <https://doi.org/10.1126/science.abe1715>
- Green, J. A. (2021). Too many zeros and/or highly skewed? A tutorial on modelling health behaviour as count data with Poisson and negative binomial regression. *Health Psychology and Behavioral Medicine*, 9(1), 436-455. <https://doi.org/10.1080/21642850.2021.1920416>
- Grün, B., & Hornik, K. (2011). topicmodels: An R package for fitting topic models. *Journal of Statistical Software*, 40(13), 1-30. <http://dx.doi.org/10.18637/jss.v040.i13>
- Hastorf, A., & Cantril, H. (1954). They saw a game: A case study. *The Journal of Abnormal and Social Psychology*, 49(1), 129-134. <https://doi.org/10.1037/h0057880>
- Holman, E. A., Garfin, D. R., & Silver, R. C. (2014). Media's role in broadcasting acute stress following the Boston Marathon bombings. *Proceedings of the National Academy of Sciences*, 111(1), 93-98. <https://doi.org/10.1073/pnas.1316265110>

- Hoyt, L. T., Zeiders, K. H., Chaku, N., Toomey, R. B., & Nair, R. L. (2018). Young adults' psychological and physiological reactions to the 2016 U.S. presidential election. *Psychoneuroendocrinology*, *92*, 162-169. <https://doi.org/10.1016/j.psyneuen.2018.03.011>
- Hulsizer, M. R., Munro, G. D., Fagerlin, A., & Taylor, S. P. (2004). Molding the past: Assimilation of historical information. *Journal of Applied Social Psychology*, *34*(5), 1048-1074. <https://psycnet.apa.org/doi/10.1111/j.1559-1816.2004.tb02583.x>
- Iyengar, S., & Kinder, D. R. (1987). *News that matters: Television and American opinion*. University of Chicago Press.
- Kirby, J. (2018, September 27). *Lindsey Graham rages in Kavanaugh hearing: "This is the most unethical sham"*. Vox. <https://www.vox.com/2018/9/27/17911604/kavanaugh-lindsey-graham-ford-hearings>
- Kosinski, M., Wang, Y., Lakkaraju, H., & Leskovec, J. (2016). Mining big data to extract patterns and predict real-life outcomes. *Psychological Methods*, *21*(4), 493-506. <http://dx.doi.org/10.1037/met0000105>
- Laurin, K. (2018). Inaugurating rationalization: Three field studies find increased rationalization when anticipated realities become current. *Psychological Science*, *29*(4), 483-495. <https://doi.org/10.1177/0956797617738814>
- Lench, H. C., Levine, L. J., Perez, K. A., Carpenter, Z. K., Carlson, S. J., & Tibbett, T. (2019). Changes in subjective well-being following the U.S. presidential election of 2016. *Emotion*, *19*(1), 1-9. <https://doi.org/10.1037/emo0000411>
- Noor, M., Kteily, N., Siem, B., & Mazziotta, A. (2019). "Terrorist" or "mentally ill": Motivated biases rooted in partisanship shape attributions about violent actors. *Social Psychological and Personality Science*, *10*(4), 485-493. <https://doi.org/10.1177/1948550618764808>



- Pew Research Center. (2014, June 12). *Political polarization in the American public*.  
<https://www.people-press.org/2014/06/12/political-polarization-in-the-american-public/>
- Pew Research Center. (2016, June 22). *Partisanship and political animosity in 2016*.  
<https://www.people-press.org/2016/06/22/partisanship-and-political-animosity-in-2016/>
- Pew Research Center. (2018, April 4). *Sexual harassment at work in the era of #MeToo*.  
<https://www.pewsocialtrends.org/2018/04/04/sexual-harassment-at-work-in-the-era-of-metoo/>
- Prins, A., Bovin, M. J., Kimerling, R., Kaloupek, D. G., Marx, B. P., Pless Kaiser, A., & Schnurr, P. P. (2015). *The Primary Care PTSD Screen for DMS-5 (PC-PTSD-5)*. [Measurement instrument].
- Relman, E. (2018, October 4). Our ‘fears have been realized’: Democrats slam FBI investigation into Kavanaugh. *Business Insider*. <https://www.businessinsider.com/democrats-slam-fbi-investigation-into-kavanaugh-2018-10>
- Richwine, L. (2018, September 28). *More than 20 million Americans glued to Kavanaugh hearing telecasts*. Reuters. <https://www.reuters.com/article/us-usa-court-kavanaugh-ratings/more-than-20-million-americans-glued-to-kavanaugh-hearing-telecasts-idUSKCN1M82MI>
- Sangalang, A., Volinsky, A. C., Liu, J., Yang, Q., Lee, S. J., Gibson, L. A., & Hornik, R. C. (2019). Identifying potential campaign themes to prevent youth initiation of e-cigarettes. *American Journal of Preventative Medicine*, 56(2S1), S65-S75.  
<https://doi.org/10.1016/j.amepre.2018.07.039>

- Shabad, R. (2018, September 27). *An angry, emotional Kavanaugh accuses Democrats of 'search and destroy'*. NBC News. <https://www.nbcnews.com/politics/congress/christine-blasey-ford-tells-senate-memories-brett-kavanaugh-assault-have-n913531>
- Shamir, J., & Shikaki, K. (2002). Self-serving perceptions of terrorism among Israelis and Palestinians. *Political Psychology*, 23(3), 537-557. <https://doi.org/10.1111/0162-895X.00297>
- Silge, J., & Robinson, D. (2016). tidytext: Text mining and analysis using tidy data principles in R. *The Journal of Open Source Software*, 1. <https://doi.org/10.21105/joss.00037>
- Stanton, S. J., LaBar, K. S., Saini, E. K., Kuhn, C. M., & Beehner, J. C. (2010). Stressful politics: Voters' cortisol responses to the outcome of the 2008 United States presidential election. *Psychoneuroendocrinology*, 35(5), 768-774. <https://doi.org/10.1016/j.psyneuen.2009.10.018>
- Stern, C., & Ondish, P. (2018). Political aspects of shared reality. *Current Opinion in Psychology*, 23, 11-14. <https://doi.org/10.1016/j.copsyc.2017.11.004>
- Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33-47). Brooks-Cole.
- Turner, J. C., Oakes, P. J., Haslam, S. A., & McGarty, C. (1994). Self and collective: Cognition and social context. *Personality and Social Psychology Bulletin*, 20(5), 454-463. <https://doi.org/10.1177/0146167294205002>
- Vallone, R., Ross, L., & Lepper, M. (1985). The hostile media phenomenon: Biased perception and perceptions of media bias in coverage of the Beirut massacre. *Journal of Personality and Social Psychology*, 49, 577-585. <https://doi.org/10.1037/0022-3514.49.3.577>

Van Bavel, J. J., & Pereira, A. (2018). The partisan brain: An identity-based model of political belief. *Trends in Cognitive Sciences*, 22(3), 213-224.

<https://doi.org/10.1016/j.tics.2018.01.004>

Xiao, Y. J., Coppin, G., & Van Bavel, J. J. (2016). Perceiving the world through group-colored glasses: A perceptual model of intergroup relations. *Psychological Inquiry*, 27(4), 255-

274. <https://doi.org/10.1080/1047840X.2016.1199221>

## **CHAPTER 3:**

**Celebrating or Mourning #OneBostonDay: Anniversary Framings of and Mental Health**

**Responses to the Boston Marathon Bombings**

## Abstract

Trauma scholars have long acknowledged the significance of anniversaries of major life events for coping, but relatively scant work has empirically examined perceptual or emotional processes in the context of these meaningful milestones. Using longitudinal data from a U.S. national sample ( $N = 505$ ), this study explored framings of and emotional responses to the 2013 Boston Marathon bombings (BMB) at its first and second anniversaries. Open-ended responses were analyzed using a grounded theory approach to identify how American adults framed the BMB at the one-year anniversary and test how framings of the BMB at the first anniversary predicted posttraumatic stress (PTS), psychological distress, and violence- and terrorism-related worry two years post-event. Of the nine framings identified at the first anniversary, two predicted psychological outcomes one year later; celebrating the marathon's continuation was associated with lower BMB-related PTS while framing that focused on perceived failures by legal actors was related to greater BMB-related PTS and worry about future violence and terrorism. Findings suggest that the way people frame collective traumatic events at their anniversaries can provide insight into ongoing coping and predict subsequent psychological adjustment, with implications for media platforms and mental health professionals.

## Anniversary framings of and mental health responses to the Boston Marathon bombings

Findings from Chapter 2 provide initial support for the hypothesis that the way in which individuals frame a collective stressful event is related to their emotional responses. However, those cross-sectional analyses only examine framing and stress responses in the immediate aftermath of a stressful collective event, which begs the question: do these relationships hold over time? While theoretical work argues that the meaning ascribed to events is not static, empirical work often treats it as such, assessing event framing primarily in the acute period without addressing how these perceptions may later change (Lazarus & Folkman, 1984; Moors et al., 2013). Given that framings can change, as can emotions along with them, it is important to explore how stressful events are framed beyond their immediate aftermath to better understand how framings are associated with subsequent mental health outcomes.

The stress and trauma field has recently begun to reconsider how time is conceptualized in the wake of stressful events. For example, Saltzman (2019) proposed a conceptual framework that argues adaptation following stressful events is more often a cyclical process punctuated by meaningful markers of time than a linear, continuous progression toward either recovery or deterioration. One particularly salient marker of time is an event anniversary, which can trigger memories of the original stressful event as well as psychological distress and other posttraumatic symptomatology (Morgan et al., 1999). While anniversary reactions have been primarily studied in the context of personal bereavement (Chow, 2009), they have also been documented in response to collective stressors, such as the Gulf War (Morgan et al., 1999; Morgan et al., 1998) and the September 11<sup>th</sup> terrorist attacks (Daly et al., 2008; Garfin et al., 2018). What is unique about collective stressful experiences is that, unlike individually experienced traumas, their anniversaries are often publicly commemorated and socially discussed, further emphasizing

these events in the collective awareness and conversations (Pennebaker & Gonzales, 2009). Thus, the anniversaries of collective stressful events may serve as culturally shared moments to reflect on and make sense of the original experience, with potentially significant implications for subsequent emotional responses and psychological adjustment.

Exploring how people frame a stressful event at its anniversary may also provide a critical window into how successfully they have been and may continue to cope with and recover from the event. Time can afford people the opportunity to employ coping strategies and make sense of a difficult experience (Lazarus & Folkman, 1984; Park, 2010; cf. Tait & Silver, 1989). Although acute adverse responses are important predictors of long-term mental health difficulties, assessing the link between framing and emotional responses when early distress is normative may fail to adequately differentiate suffering that is typical and will soon dissipate from that which will endure (Bryant & Harvey, 1998; Norris et al., 2009). Thus, examining framing of a stressful event one year later can both provide insight into the dynamic appraisal process beyond the acute period, as well as assess its relationship to distress when maladaptive framings may signal ineffective coping and persistent dysfunction.

Given the event-specific nature of framing, what constitutes a maladaptive frame is likely to differ across events and event types. However, prior research on stress and coping provides evidence for probable characterizations of these types of framings. For example, work on stress appraisals has found that framing difficult experiences as challenges and opportunities for growth is associated with better adjustment than framing them as sources of real or anticipated damage (Lazarus & Folkman, 1984; Schneider, 2004). Furthermore, the temporal focus of an event framing may also be important to consider, given that attending more to the past and less to the future following a traumatic event has been linked to greater distress and diminished well-

being (Holman & Silver, 1998; Holman et al., 2016). Finally, narrative work has shown that people who frame stories of adversity in terms of redemption tend to experience better mental health and greater well-being, whereas individuals who view adversity as contaminating an otherwise positive life report diminished well-being (McAdams & McLean, 2013; McAdams et al., 2001). Together, these findings suggest that stressful event framings that emphasize threat or harm, are past-focused, and/or describe a negative transformation may be maladaptive and may be associated with poorer long-term mental health outcomes.

Study 2 addresses these empirical questions about framing and emotional responses using existing longitudinal data tracking the responses of a representative national sample studied in the aftermath of the Boston Marathon bombings and followed for several years. Specifically, this study examined how people framed this collective stressful event at its first anniversary and explored whether these framings differentially predicted general and event-specific distress as well as worry about the reoccurrence of similar events one year later. It was expected that maladaptive framings of the Boston Marathon bombings would predict greater event-related posttraumatic stress, psychological distress, and violence- and terrorism-related worry at the second anniversary.

## **Method**

### **Design, Data Collection, and Sample**

Data for the present study were collected from a sample of American adults as part of a larger, multi-year study designed to assess short- and long-term psychological responses to the Boston Marathon bombings (BMB). Participants were drawn from a nationally representative panel of U.S. residents (i.e., the KnowledgePanel) maintained by GfK, a survey research company, that recruits panelists using address-based sampling. In exchange for completing



online surveys, panelists received Internet access or other compensation (e.g., gift prizes). If recruited panelists did not have access to a computer, they were supplied with a laptop to support research participation and maintain representativeness. All procedures for this study were reviewed and approved by the Institutional Review Board of the University of California, Irvine.

The current study analyzed data collected around the anniversary of the Boston Marathon bombings one- and two-years post-event. At the one-year anniversary, between April 18 and May 5, 2014, participants ( $n = 3,260$ ) were given the opportunity to provide written responses sharing their thoughts or feelings about the Boston Marathon bombings. Participants ( $n = 3,029$ ) were then assessed at the second anniversary one year later, between April 29 and June 24, 2015, and provided data on their psychological adjustment.

## **Measures**

### ***Demographics and Mental Health History***

Upon entry to the panel and prior to the start of the current study, KnowledgePanelists provided demographic information as well as information about their mental health history. Demographic information included age, gender, ethnicity, educational attainment, and household income. To assess prior mental health, participants indicated whether they had ever been previously diagnosed with any depression or anxiety disorders. Responses were coded such that 0 indicated receiving no prior diagnoses, 1 indicated receiving a diagnosis for either anxiety or depression, and 2 indicated diagnoses for both anxiety and depression.

### ***Cumulative Direct Prior Exposure to Collective Trauma***

Given evidence of the sensitizing impact of repeated exposure to collective trauma (e.g., Garfin et al., 2015), cumulative direct exposure to prior collective traumatic events was assessed as a covariate in this study. Participants reported whether they had witnessed several recent

collective traumatic events proximally located in the Northeastern U.S., including the September 11<sup>th</sup> terrorist attacks, Superstorm Sandy, and the Sandy Hook Elementary School shooting. Responses were coded dichotomously (0 = no direct exposure, 1 = self or close other directly exposed) and summed to create an index of cumulative direct exposure to these prior collective traumatic events.

### ***Direct Exposure to the Boston Marathon Bombings***

The extent to which participants were directly exposed to the Boston Marathon bombings was assessed using a modified version of a measure used in prior research on disaster exposure (e.g., Holman & Silver, 1998). Respondents indicated their proximity to the bombing site and subsequent lockdown using 15 items (e.g., “I was a spectator at the Boston Marathon at the time of the bombings”). Responses were coded dichotomously (0 = no direct exposure, 1 = self or close other exposed) and summed to indicate the degree of direct exposure to both the Boston Marathon bombings and the subsequent Boston-area lockdown.

### ***Thoughts and Feelings about the BMB***

One year after the Boston Marathon bombings, participants were asked a single open-ended question prompting them to share any thoughts or feelings they were experiencing surrounding the anniversary of the Boston Marathon bombings. Participants were provided a text box in which to write their responses that had no character limit, thereby allowing participants to write as much as they wished. Responses were coded for both thematic content and length of response (in total number of words), given prior work linking longer open-ended responses to poorer psychological outcomes following collective trauma (Seery et al., 2008).

### ***Boston Marathon Bombing-Related Posttraumatic Stress***

Posttraumatic stress responses to the Boston Marathon bombings were assessed two years after the event using the Primary Care – PTSD Screen (PC-PTSD; Calhoun et al., 2010). The PC-PTSD contains four items designed to capture each of the trademark characteristics of PTSD (i.e., re-experiencing, avoidance, numbing, and hyperarousal). Participants indicated how often in the past month they had experienced each symptom on a 5-point scale (1 = *never* to 5 = *all the time*). Responses were rescored (0 = *never* to 4 = *all the time*) to create a meaningful zero point and averaged, demonstrating good internal consistency ( $\alpha = 0.79$ ).

### ***Psychological Distress***

To assess general psychological distress, participants completed 9 items from the Brief Symptom Inventory (BSI-18; Derogatis, 2001) at the second anniversary of the BMB, indicating the extent to which each of the 9 symptoms of depression, anxiety, and somatization had distressed or bothered them in the past week on a 5-point scale (0 = *not at all* to 4 = *extremely*). Responses were averaged to create an index for each participant's general level of psychological distress with strong internal consistency ( $\alpha = 0.88$ ).

### ***Violence- and Terrorism-Related Worry***

Items assessing worry about future community violence and terrorism two years post-BMB were adapted from measures used in prior research conducted on collective trauma (e.g., Silver et al., 2002; Thompson et al., 2019). Specifically, four items assessed the frequency of fear/worry in the last week about the possibility of being directly or indirectly (e.g., through a family member, community) impacted by acts of violence and terrorism on a scale from 1 (*never*) to 5 (*all the time*). Items were recoded to 0-4 to give all variables a comparable baseline score. Responses were averaged and displayed good internal consistency ( $\alpha = 0.86$ ).

### **Data Analysis**

### ***Qualitative Analysis***

Study 2 used text analyses previously conducted on this dataset. In a prior study (Lubens et al., 2016), a random subset of 600 responses was reviewed and coded in two iterative rounds of analysis to identify salient themes or framings, in accordance with a grounded theory approach (Corbin & Strauss, 1990). Three coders independently reviewed a unique set of 100 responses to identify framings, after which they discussed their respective results, coded the other coders' sets of responses, and reached a consensus about all results. This process was repeated with one additional set of 300 responses, at which point data saturation was reached – that is, the new round of analysis did not reveal any additional novel framings. These analyses revealed nine salient themes (see below) and each of the 600 responses was dichotomously coded for the absence (0) or the presence (1) of each theme.

### ***Quantitative Analysis***

Using Stata 17 (Stata Corp, College Station, TX, 2021), three multivariate Ordinary Least Squares (OLS) regression models were used to test how the various framings of the Boston Marathon bombings at the first anniversary predicted BMB-related posttraumatic stress responses, general psychological distress, and violence- and terrorism-related worry at the second anniversary. All models were adjusted for covariates, including demographic information, prior mental health history, prior cumulative exposure to collective trauma, direct exposure to the BMB, and response length. Regression models were Bonferroni-adjusted to account for multiple familywise comparisons.

## **Results**

### **Qualitative Analysis Results**

Manual coding conducted in prior research identified nine themes: (1) concern about safety and security, (2) focus on victims and/or their families, (3) the marathon continuing, (4) pride in Boston or America, (5) expressing sadness, (6) blaming someone for the attack, (7) media coverage, (8) focus on law enforcement or the legal system, and (9) being neutral or disinterested. Each of the themes are described in more detail below.

### ***Concern about Safety and Security***

The theme most referenced in responses (28.00%) centered on concerns about future breaches in security and about danger becoming more commonplace in general. One exemplary response was, “I’m not from Boston, but the thought alone where you can’t even enjoy a day out watching an event no matter where that may be without thinking that some sicko out there will do something as terrible as this. It’s scary ... It makes me think twice about going anywhere as much anymore afraid all the time. FYI: since 9/11 my life never been the same.”

### ***Focus on Victims and/or Their Families***

About a quarter (25.67%) of participants mentioned the victims and/or their families. Responses conveyed remembrance of those killed in the attacks and their families and/or admiration for the survivors who have persevered. For example, one participant wrote, “The survivors have a long road back, and those families that lost a loved one will bear that grief forever, but there has been much healing, both physical and emotional, during the last year. And there will be more healing to come. I anticipate that this year’s marathon will be a joyful celebration.”

### ***The Marathon Continuing***

About a fifth (22.83%) of participants wrote about the marathon continuing, expressing excitement and optimism about the event and conveying that its continuation symbolized

recovery and redemption. One respondent shared this statement: “I am excited to see how many people are running in this years’ race especially the ones that ran last year as well.”

### ***Pride in Boston or America***

Another fifth (19.67%) of respondents expressed pride in Boston or America. Responses containing this theme often referenced the phrase “Boston Strong,” a slogan that arose in reaction to the bombings affirming the resilience of Bostonians, or conveyed patriotism and determination to not let the United States be defeated by terrorism. One exemplar response is, “We will Rise from this. We will be united and let no one ruin USA Spirit. We are a free country and we will stand together and run and be united.”

### ***Expressing Sadness***

A minority (17.5%) of responses expressed sadness related to the bombings. One such response is, “I feel very sad and affronted for the people that lost their lives. The ones injured and all who have to suffer for such a terrible act. Isn’t it enough for the misery & heartbreak that comes to us naturally?”

### ***Blaming Someone for the Attack***

A small but sizable (16.00%) of responses focused on assigning blame for the attacks, either on Muslims for perpetrating and/or condoning the acts of terrorism or the U.S. government for failing to protect Americans. One respondent wrote, “If our government did their job and investigated these two, maybe we wouldn’t have had a bombing...”

### ***Media Coverage***

A small number (11.5%) of responses mentioned media coverage of the bombings and conveyed dissatisfaction with the quantity of coverage at the anniversary. One respondent wrote,

“I am tired of hearing constant reporting on this. One mention on the day of the marathon was all that was needed. Quit giving terrorism so much reporting, it just validates their cause.”

### ***Focus on Law Enforcement or the Legal System***

A minority (8.83%) of respondents shared their dissatisfaction with the response of various legal actors, including the police, the legal system, and the government, to the Boston Marathon bombings. One participant wrote, “I also have negative feelings concerning the heavy-handed actions of the government in response to the event. The trashing of constitutional rights and lies from government agencies is particularly troublesome. The FBI claimed very early on that they had no knowledge of the perpetrators, now we find that they had been aware of them for more than two years.”

### ***Being Neutral or Disinterested***

Roughly a fifth (18.5%) of participants shared neutral responses to the prompt, indicating that they did not have thoughts or feelings about the Boston Marathon bombings. For example, one respondent wrote, “No thoughts about it. I usually don’t watch the Boston Marathon, and I didn’t know anyone in person that participated in the marathon.”

### **Quantitative Analysis Results**

Because this study examined the relationships between framings identified in text responses and subsequent mental health outcomes, the current sample was limited to those participants who responded to the open-ended question at the one-year anniversary and whose responses were coded for those framings. Thus, the 600 randomly selected responses that were coded in prior research were eligible to be included in the present analysis and ultimately, with 505 participants ultimately included in these quantitative analyses because they had complete data on all variables included in the regression models. This final subsample was 53.5% female,

ranged in age from 18-92 ( $M = 51.39$ ,  $SD = 16.83$ ), and was 77.5% White (non-Hispanic), 9.67% Hispanic, 6.67% Black (non-Hispanic), and 6.17% other ethnicities (non-Hispanic). About half (47.33%) had a bachelor's degree or higher and 66.5% had an annual income of \$50,000 or more. About 11% of the current sample reported a prior diagnosis of either depression or anxiety, 6.17% reported both diagnoses, and 82.92% reported neither mental health diagnosis. Most participants (73.17%) reported having had no exposure to prior community trauma, with 17.17% reporting exposure to at least 1 prior community trauma and 9.67% reporting exposure to 2 or 3 prior community traumas. The majority of this sample (88.5%) were not directly exposed to the BMB but 11.5% reported some form of direct exposure to the event.

To examine whether and how participants who provided open-ended responses may have differed from those who chose not to do so, a multiple logistic regression using sample weights compared the current sample to the full sample of 3,260 participants. Results revealed that the subsample used in the current study did not significantly differ from the full sample of 3,260 participants on any covariate used in the present analyses, including age, gender, ethnicity, education, income, prior mental health history, prior cumulative exposure to collective trauma, or direct exposure to the BMB ( $ps > .26$ ).

The three outcome measures in the present study were significantly correlated with one another. BMB-related posttraumatic stress and global psychological distress were moderately correlated ( $r = .43$ ,  $p < .001$ ). Additionally, worry about future violence and terrorism was significantly associated with both BMB-related PTS ( $r = .56$ ,  $p < .001$ ) and psychological distress ( $r = .34$ ,  $p < .001$ ).

Table 1 presents multivariate OLS regression analyses examining predictors of BMB-related posttraumatic stress responses, psychological distress, and violence- and terrorism-related



worry. Using the Bonferroni-adjusted significance thresholds, no BMB framings were significantly associated with general and event-related mental health outcomes one year later. However, two BMB framings did meet traditional thresholds for significance ( $p < .05$ ) as predictors of posttraumatic adjustment one year later; for the purposes of this dissertation, these findings are discussed with important caveats (see Discussion below).

Using traditional significance thresholds ( $p < .05$ ), two of the nine themes identified among responses at the one-year anniversary of the Boston marathon bombings were significantly associated with general and event-specific mental health outcomes at the second anniversary. Use of the marathon continuing theme one year after the BMB was related to significantly lower BMB-related posttraumatic stress at the second anniversary ( $b = -.14$ ,  $B = -.11$ ,  $p = .021$ ). Also, mentioning the law enforcement or the legal system theme one year after the BMB was linked to significantly higher BMB-related posttraumatic stress ( $b = .17$ ,  $B = .09$ ,  $p = .041$ ) and worry about the reoccurrence of violence and terrorism at the second anniversary ( $b = .24$ ,  $B = .09$ ,  $p = .039$ ). These findings were statistically significant even while controlling for demographics (age, gender, ethnicity, education, income), prior mental health history, prior community trauma exposure, direct BMB exposure, and response length (in words). The remaining seven themes were not significantly associated with general or event-specific mental health outcomes at the second anniversary ( $ps > .05$ ).

**Table 1**Predictors of BMB-related Posttraumatic Stress, Psychological Distress, and Worry about Violence and Terrorism ( $N = 505$ )

Predictor Variable	BMB-related Posttraumatic Stress		Psychological Distress		Violence- and Terrorism-Related Worry	
	<i>b</i> (95% CI)	<i>B</i>	<i>b</i> (95% CI)	<i>B</i>	<i>b</i> (95% CI)	<i>B</i>
Age	0.00 (-0.01, -0.01)	0.02	0.00 (-0.01, 0.01)	-0.09	0.00 (-0.01, 0.01)	0.04
Gender (Female)	0.05 (-0.05, 0.15)	0.05	0.03 (-0.07, 0.12)	0.02	0.15 (0.02, 0.28)	0.10*
Ethnicity						
Black, non-Hispanic	0.24 (0.05, 0.43)	0.11*	0.08 (-0.11, 0.27)	0.04	0.00 (-0.26, 0.27)	0.00
Hispanic	0.04 (-0.13, 0.21)	0.02	-0.05 (-0.22, 0.12)	-0.03	0.14 (-0.10, 0.38)	0.05
Other, non-Hispanic	0.32 (0.12, 0.52)	0.14**	0.14 (-0.06, 0.33)	0.06	0.15 (-0.12, 0.43)	0.05
Education						
High school	0.12 (-0.11, 0.34)	0.09	0.12 (-0.10, 0.34)	0.09	0.17 (-0.15, 0.48)	0.09
Some college	-0.01 (-0.23, 0.22)	0.00	0.04 (-0.19, 0.26)	0.03	0.03 (-0.29, 0.34)	0.02
Bachelor's or more	-0.06 (-0.29, 0.17)	-0.06	-0.04 (-0.27, 0.18)	-0.04	-0.08 (-0.39, 0.24)	-0.05
Income	-0.01 (-0.04, 0.02)	-0.04	-0.03 (-0.06, -0.01)	-0.11*	-0.02 (-0.05, 0.02)	-0.04
Prior mental health	0.06 (-0.03, 0.15)	0.06	0.23 (0.15, 0.32)	0.23***	0.16 (0.04, 0.28)	0.12*
Prior trauma exposure	0.08 (0.01, 0.15)	0.10*	0.06 (-0.01, 0.13)	0.08	0.07 (-0.02, 0.17)	0.07
Direct BMB exposure	0.23 (0.08, 0.39)	0.13**	-0.01 (-0.16, 0.14)	-0.01	0.08 (-0.13, 0.29)	0.03
Response length	0.00 (0.00, 0.00)	0.11*	0.01 (0.00, 0.01)	0.16**	0.00 (-0.01, 0.01)	0.08
Safety & security	0.04 (-0.08, 0.16)	0.03	0.07 (-0.05, 0.18)	0.06	0.16 (-0.01, 0.32)	0.09
Victims focus	-0.09 (-0.20, 0.03)	-0.07	-0.04 (-0.16, 0.07)	-0.03	-0.08 (-0.24, 0.08)	-0.05
Marathon continuing	-0.14 (-0.27, -0.02)	-0.11*	-0.04 (-0.16, 0.08)	-0.03	-0.09 (-0.26, 0.08)	-0.05
Pride in Boston/US	0.02 (-0.11, 0.14)	0.01	-0.03 (-0.16, 0.09)	-0.02	0.04 (-0.14, 0.22)	0.02
Sadness	-0.03 (-0.16, 0.09)	-0.02	0.04 (-0.08, 0.16)	0.03	0.03 (-0.14, 0.20)	0.01
Blame for attacks	-0.12 (-0.26, 0.02)	-0.08	-0.09 (-0.23, 0.04)	-0.07	0.04 (-0.15, 0.23)	0.02
Media coverage	-0.09 (-0.25, 0.06)	-0.05	-0.07 (-0.23, 0.08)	-0.04	-0.16 (-0.38, 0.06)	-0.07
Law enforcement	0.17 (0.01, 0.34)	0.09*	0.13 (-0.03, 0.29)	0.07	0.24 (0.01, 0.47)	0.09*
Neutral	-0.05 (-0.19, 0.08)	-0.03	0.04 (-0.09, 0.18)	0.03	-0.06 (-0.25, 0.13)	-0.03
Constant	1.18 (0.88, 1.48)		0.43 (0.13, 0.72)		1.59 (1.17, 2.00)	
Model statistics	$F(22, 481) = 2.57^{***}$ $R^2 = 0.11$		$F(22, 481) = 3.69^{***}$ $R^2 = .14$		$F(22, 482) = 2.52^{***}$ $R^2 = .10$	

Note: Table presents both standardized (*B*) and unstandardized (*b*) regression coefficients. Mental health was coded as follows: 0 = no anxiety or depression, 1 = at least one diagnosis for either anxiety or depression, 2 = both anxiety and depression. The reference groups for gender, ethnicity, and education were males, Whites, and “less than high school,” respectively.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

## Discussion

Results from the present study demonstrated support for the longitudinal link between event framing and posttraumatic adjustment, finding that two distinct framings of the Boston Marathon bombings at the one-year anniversary significantly predicted general and event-specific mental health responses one year later. Specifically, individuals who focused on the continuation of the marathon since the attacks reported less BMB-related posttraumatic stress, whereas those who framed the BMB around mishandling by legal actors experienced poorer subsequent psychological responding, such as greater BMB-related posttraumatic stress and heightened worry about future violence and terrorism. These associations held even when controlling for strong predictors of posttraumatic adjustment, including prior mental health status, prior collective trauma exposure, direct BMB exposure, and response length. These findings support our hypotheses and are consistent with prior work tying posttraumatic mental health outcomes to framing events in terms of threatened or incurred damage, past- and future-focus, and redemption and contamination narratives. The marathon continuing theme focused on the present over the past and a redemptive transformation from tragedy to recovery, framing elements that have been similarly connected to greater psychological adjustment and well-being (Adler et al., 2016; Cox et al., 2019; Zimbardo & Boyd, 1999). The law enforcement or legal system framing centered on past perceived wrongdoings by various legal actors and the threats these actions posed to constitutional rights and physical safety, themes similarly linked to poorer well-being and distress in prior research (e.g., Kibler, 2018; Zacher & Rudolph, 2021). Together, these findings provide evidence that event framings beyond the acute period can still meaningfully predict subsequent posttraumatic adjustment, up to one year later.

These findings contribute to a growing body of work exploring how the concept of time factors into coping with and adjustment to trauma. Anniversaries of collective traumatic events represent significant markers of time, ones that are publicly commemorated and often evoke memories and emotions associated with the event (Saltzman, 2019). These days of remembrance can reactivate feelings of distress, even for individuals who have otherwise adjusted to the traumatic event, demonstrating the cyclical nature of posttraumatic adaptation and the need for continued coping efforts (Rabinowitz et al., 2021). By exploring the link between event framing and mental health outcomes within the context of a collective traumatic event's first and second anniversaries, the present work adds to our understanding of posttraumatic adjustment over time and the factors that are related to better or worse mental health outcomes surrounding these meaningful mileposts.

Despite finding evidence in support of our hypotheses, the present study has several limitations. As mentioned previously, none of the nine framings significantly predicted subsequent mental health outcomes using Bonferroni-corrected significance thresholds, meaning that the framings did not provide statistically significant predictive value according to the most stringent criteria. However, researchers have criticized Bonferroni corrections for being too conservative (Bender & Lange, 1999) and argued that other corrections may be more appropriate to avoid type II errors (Perneger, 1998). Given these arguments, the results that were significant at traditional thresholds were reported and discussed; however, we strongly advise caution in interpreting these findings and recommend that future research identify multiple comparison corrections better suited for these analyses.

Another limitation concerns the number of framings significantly linked to posttraumatic mental health. Only two of the nine themes identified in qualitative analyses were found to be

significantly associated with general and event-specific mental health outcomes, meaning that the remaining seven themes were unrelated to psychological responses one year later, including ones that also contained a focus on threatened or incurred damage, a past- or future-focus, and/or a redemption or contamination narrative, such as pride in Boston and/or America. Furthermore, the significant associations that were found between event framings and mental health outcomes were relatively small. While inconsistent support for our hypotheses and small effect sizes do limit the explanatory power of our findings, the current study is among the first to longitudinally link framing of a collective traumatic event to posttraumatic adjustment. Thus, despite its limitations, this study does demonstrate that unique framings of a mass violence event can predict mental health outcomes, albeit modestly, one year later. To investigate the practical significance of this finding, future research should assess the relationship between event framing and posttraumatic mental health outcomes both cross-sectionally and longitudinally to compare effect sizes at both timepoints and explore whether the small effect sizes found in the present study are the result of relationships that have decayed over time or whether they simply capture relationships that are statistically small. Regardless, even if the true effects detected in the present study are small, they may still represent meaningful consequences for the short- and long-term mental health of the population impacted by this collective traumatic event (Funder & Ozer, 2019), so it is important to explore and consider the implications of these effects.

It should also be noted that population-based inferences cannot be made from these findings. Although the full sample in this study was drawn from a nationally representative panel, the sample in the current study was restricted to the subset of 600 participants whose open-ended responses were coded for event framings for qualitative analyses and 505 participants for whom there was complete data to be included in quantitative analyses. Because

only a portion of the full sample was analyzed in the current study, poststratification population weights could not be used in the present analyses, thereby precluding population-based inferences about these findings. However, as previously discussed, a logistic regression analysis using poststratification weights was conducted to compare the subsample to the full sample and revealed that the subsample was not statistically different from the full sample on any of the covariates or key variables included in the analyses presented here. Thus, while poststratification weights could not be used in the present analyses, the present subsample does not meaningfully differ from the full national sample.

This study provides initial evidence of the longitudinal link between event framings and mental health outcomes following collective trauma that offers many promising avenues for future research. In the current study, event framing was assessed at a single time point at the one-year anniversary, which offered an insightful snapshot of the way individuals viewed the event at that time but with no information as to how they framed the event during the acute period or whether their framing may have changed from the immediate aftermath to the first anniversary. Given that event framing is a dynamic process (e.g., Lazarus & Folkman, 1984; Moors et al., 2013), future research should assess it both at the time of the event and at various points in the months thereafter to examine whether and how people's event framings evolve over time and how changes in event framing correspond to mental health outcomes. By developing a more fine-grained picture of event framing over time, researchers may capture dynamic changes in the coping process and investigate the impact that changing framings may have on posttraumatic adjustment.

Relatedly, future work should also assess mental health outcomes both at the anniversary as well as at proximal times surrounding it to disentangle chronic maladjustment from

anniversary reactions. The current work explored the relationship between event framing and posttraumatic adjustment at the first and second anniversary of the Boston Marathon bombings, respectively. While assessing these variables within the same temporal context controlled for deviations in psychological responding around anniversaries that might otherwise confound results (e.g., Bruce & Weaver, 2021; Fan et al., 2015), this design also limited the generalizability of our findings beyond the anniversary context. To examine whether the longitudinal relationship between event framing and mental health outcomes holds outside of the anniversary context, future research should measure posttraumatic psychological adjustment at multiple timepoints shortly preceding, during, and following event anniversaries to parse the predictive power of event framing at times when heightened distress is more versus less normative.

These findings have important implications for the way that media outlets frame news coverage related to anniversaries of collective traumatic events. There is a substantial body of evidence demonstrating the link between media exposure to disasters and large-scale violence and negative psychological outcomes (e.g., Hopwood & Schutte, 2017), and recent work has found that exposure to anniversary coverage framed with a more negative emotional tone was associated with greater distress and threat reactivity (Wormwood et al., 2019). Given the power of the news media to shape how their audiences frame the events they cover (e.g., Iyengar & Kinder, 1987) and the current evidence that collective traumatic event framings are tied to mental health outcomes, media organizations may play a significant role in informing how the public construes collective traumatic events around these anniversaries with consequences for emotional responses and overall mental well-being. Although more research is needed to disentangle the role of news media in shaping event framings and emotional responses, these

findings suggest that news organizations should consider the psychological ramifications of how collective trauma-related media coverage is presented and how to frame anniversary coverage in ways that could promote resilience and recovery, rather than distress and impaired functioning.

Deepening our understanding of event framing and its relationship with posttraumatic mental health outcomes is also crucial to support public health following collective trauma. With greater awareness of the emotional impact of event framing and characteristics of framings associated with poorer adjustment, intervention efforts can better identify individuals at risk for psychological dysfunction after collective traumatic events and direct them to clinical services. Furthermore, mental health professionals may consider addressing maladaptive event framings in their work with clients adversely impacted by collective traumatic events to promote better adjustment, a strategy that work on positive reappraisal similarly suggests may be effective when coping with trauma (e.g., Brown et al., 2021; Lachnit et al., 2020). To develop effective public health policies and therapeutic practices for alleviating the mental health burden of collective traumatic events, it is crucial to consider how people frame these events, both in the short- and long-term, and identify which framings are linked to adjustment over time.



## References

- Adler, J. M., Lodi-Smith, J., Philippe, F. L., & Houle, I. (2016). The incremental validity of narrative identity in predicting well-being: A review of the field and recommendations for the future. *Personality and Social Psychology Review*, 20(2), 142-175.  
<https://doi.org/10.1177/1088868315585068>
- Bender, R., & Lange, S. (1999). Multiple test procedures other than Bonferroni's deserve wider use. *BMJ*, 318(7138), 600. <https://doi.org/10.1136/bmj.318.7183.600a>
- Brown, R. L., Wood, A., Carter, J. D., & Kannis-Dymand, L. (2022). The metacognitive model of post-traumatic stress disorder and metacognitive therapy for post-traumatic stress disorder: A systematic review. *Clinical Psychology & Psychotherapy*, 29, 131-146.  
<https://doi.org/10.1002/cpp.2633>
- Bruce, M. J., & Weaver, T. L. (2021). Testing cognitive models to characterize trauma anniversary reactions marked by stress and growth. *OMEGA – Journal of Death and Dying*. Advance online publication. <https://doi.org/10.1177/00302228211066687>
- Bryant, R. A., & Harvey, A. G. (1998). Relationship between acute stress disorder and posttraumatic stress disorder following mild traumatic brain injury. *The American Journal of Psychiatry*, 155(5), 625–629. <https://doi.org/10.1176/ajp.155.5.625>
- Calhoun, P.S., McDonald, S. D., Guerra, V. S., Eggleston, A. M., Beckham, J. C., & Straits-Troster, K. (2010). Clinical utility of the Primary Care – PTSD Screen among U.S. veterans who served since September 11, 2001. *Psychiatry Research*, 178, 330-335.  
<https://doi.org/10.1016/j.psychres.2009.11.009>

- Chow, A. Y. (2009). Anticipatory anniversary effects and bereavement: Development of an integrated explanatory model. *Journal of Loss and Trauma, 15*(1), 54–68.  
<https://doi.org/10.1080/15325020902925969>
- Cox, K. S., Hanek, K. J., & Cassario, A. L. (2019). Redemption in a single low point story longitudinally predicts well-being: The incremental validity of life story elements. *Journal of Personality, 87*(5), 1009-1024. <https://doi.org/10.1111/jopy.12452>
- Daly, E. S., Gulliver, S. B., Zimering, R. T., Knight, J., Kamholz, B. W., & Morissette, S. B. (2008). Disaster mental health workers responding to Ground Zero: One year later. *Journal of Traumatic Stress, 21*(2), 227–230. <https://doi.org/10.1002/jts.20311>
- Fan, F., Long, K., Zhou, Y., Zheng, Y., & Liu, X. (2015). Longitudinal trajectories of post-traumatic stress disorder symptoms among adolescents after the Wenchuan earthquake in China. *Psychological Medicine, 45*(13), 2885-2896.  
<https://doi.org/10.1017/S0033291715000884>
- Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. *Advances in Methods and Practices in Psychological Science, 2*(2), 156-168.  
<https://doi.org/10.1177/2515245919847202>
- Garfin, D. R., Holman, E. A., & Silver, R. C. (2015). Cumulative exposure to prior collective trauma and acute stress responses to the Boston Marathon Bombings. *Psychological Science, 26*(6), 675-683. <https://doi.org/10.1177/0956797614561043>
- Garfin, D. R., Poulin, M. J., Blum, S., & Silver, R. C. (2018). Aftermath of terror: A nationwide longitudinal study of posttraumatic stress and worry across the decade following the September 11, 2001 terrorist attacks. *Journal of Traumatic Stress, 31*, 146–156.  
<https://doi.org/10.1002/jts.22262>

- Holman, E. A., & Silver, R. C. (1998). Getting “stuck” in the past: Temporal orientation and coping with trauma. *Journal of Personality and Social Psychology*, 74(5), 1146-1163. <https://doi.org/10.1037/0022-3514.74.5.1146>
- Holman, E. A., Silver, R. C., Mogle, J. A., & Scott, S. B. (2016). Adversity, time, and well-being: A longitudinal analysis of time perspective in adulthood. *Psychology and Aging*, 31(6), 640–651. <https://doi.org/10.1037/pag0000115>
- Hopwood, T. L., & Schutte, N. S. (2017). Psychological outcomes in reaction to media exposure to disasters and large-scale violence: A meta-analysis. *Psychology of Violence*, 7(2), 316-327. <https://doi.org/10.1037/vio0000056>
- Iyengar, S., & Kinder, D. R. (1987). *American politics and political economy. News that matters: Television and American opinion*. University of Chicago Press.
- Kibler, J. L. (2018). An extension of the perseverative cognition hypothesis to posttraumatic stress disorder symptomatology: Cardiovascular recovery in relation to posttraumatic stress disorder severity and cognitive appraisals of stress. *Journal of Traumatic Stress*, 31(1), 25-34. <https://doi.org/10.1002/jts.22252>
- Lachnit, I., Park, C. L., & George, L. S. (2020). Processing and resolving major life stressors: An examination of meaning-making strategies. *Cognitive Therapy and Research*, 44(5), 1015-1024. <https://doi.org/10.1007/s10608-020-10110-7>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer Publishing Company.
- Lubens, P., Holman, E. A., & Silver, R. C. (2016). *Media forecasting anniversary reactions to the Boston Marathon bombings*. [Unpublished manuscript]. Department of Public Health, University of California, Irvine, Irvine, California.

- McAdams, D. P., & McLean, K. C. (2013). Narrative identity. *Current Directions in Psychological Science*, 22(3), 233–238. <https://doi.org/10.1177/0963721413475622>
- McAdams, D. P., Reynolds, J., Lewis, M., Patten, A. H., & Bowman, P. J. (2001). When bad things turn good and good things turn bad: Sequences of redemption and contamination in life narrative and their relation to psychosocial adaptation in midlife adults and in students. *Personality and Social Psychology Bulletin*, 27(4), 474–485. <https://doi.org/10.1177/0146167201274008>
- Morgan, C. A., Hill, S., Fox, P., Kingham, P., & Southwick, S. M. (1999). Anniversary reactions in Gulf War veterans: A follow-up inquiry 6 years after the war. *The American Journal of Psychiatry*, 156(7), 1075–1079. <https://doi.org/10.1176/ajp.156.7.1075>
- Morgan, C. A. III, Kingham, P., Nicolaou, A., & Southwick, S. M. (1998). Anniversary reactions in Gulf War veterans: A naturalistic inquiry 2 years after the Gulf War. *Journal of Traumatic Stress*, 11(1), 165–171. <https://doi.org/10.1023/A:1024473519720>
- Moors, A., Ellsworth, P. C., Scherer, K. R., & Frijda, N. H. (2013). Appraisal theories of emotion: State of the art and future development. *Emotion Review*, 5(2), 119-124. <https://doi.org/10.1177/1754073912468165>
- Norris, F. H., Friedman, M. J., Watson, P. J., Byrne, C. M., Diaz, E., & Kaniasty, K. (2002). 60,000 disaster victims speak: Part 1. An empirical review of the empirical literature, 1981-2001. *Psychiatry: Interpersonal and Biological Processes*, 65(3), 207–239. <https://doi.org/10.1521/psyc.65.3.207.20173>
- Park, C. L. (2010). Making sense of the meaning literature: An integrative review of meaning making and its effects on adjustment to stressful life events. *Psychological Bulletin*, 136(2), 257–301. <http://doi.org/10.1037/a0018301>

- Pennebaker, J. W., & Gonzales, A. (2009). Making history: Social and psychological processes underlying collective memory. In P. Boyer & J. Wertsch (Eds.), *Memory in mind and culture* (pp. 110–129). Cambridge University Press.
- Perneger, T. V. (1998). What's wrong with Bonferroni adjustments. *BMJ*, *316*(7136), 1236-1238. <https://doi.org/10.1136/bmj.316.7139.1236>
- Rabinowitz, E. P., Sayer, M. A., Samii, M. R., Straub, E. L., Kutash, L. A., & Delahanty, D. L. (2021). The 50<sup>th</sup> anniversary of May 4, 1970 is associated with elevations of distress but no increase in mental health symptoms. *Stress and Health*, 1-12. <https://doi.org/10.1002/smi.3117>
- Saltzman, L. Y. (2019). It's about time: Reconceptualizing the role of time in loss and trauma. *Psychological Trauma: Theory, Research, Practice, and Policy*, *11*(6), 663–670. <https://doi.org/10.1037/tra0000435>
- Schneider, T. R. (2004). The role of neuroticism on psychological and physiological stress responses. *Journal of Experimental Social Psychology*, *40*(6), 795–804. <https://doi.org/10.1016/j.jesp.2004.04.005>
- Seery, M. D., Silver, R. C., Holman, E. A., Ence, W. A., & Chu, T. Q. (2008). Expressing thoughts and feelings following a collective trauma: Immediate responses to 9/11 predict negative outcomes in a national sample. *Journal of Consulting and Clinical Psychology*, *76*(4), 657-667. <https://doi.org/10.1037/0022-006X.76.4.657>
- Tait, R., & Silver, R. C. (1989). Coming to terms with major negative life events. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 351–382). Guilford.

- Wormwood, J. B., Lin, Y. R., Lynn, S. K., Barrett, L. F., & Quigley, K. S. (2019). Psychological impact of mass violence depends on affective tone of media content. *PLoS ONE*, *14*(4), e0213891. <https://doi.org/10.1371/journal.pone.0213891>
- Zacher, H., & Rudolph, C. W. (2021). Individual differences and changes in subjective wellbeing during the early stages of the COVID-19 pandemic. *American Psychologist*, *76*(1), 50-62. <https://doi.org/10.1037/amp0000702>
- Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology*, *77*(6), 1271-1288. <https://doi.org/10.1037/0022-3514.77.6.1271>

## **CHAPTER 4:**

# **One Event as Many Stressors: COVID-19-Related Worries and General and Event-Specific Distress**

## Abstract

Unprecedented in scale, scope, and duration, the COVID-19 pandemic has impacted nearly every aspect of modern life, representing a collective traumatic event with a multitude of secondary stressors extending beyond the health domain. Using data collected from a national sample of American adults in the early days of the pandemic ( $N = 1,000$ ), this study assessed participants' greatest COVID-19-related worries to examine what types of stressors this event represented, how the prevalence of pandemic-related worries shifted over time, and how worries were differentially associated with general and event-specific distress and emotional responses, in the short-term and six months later. Common COVID-19-related worries pertained to physical and mental health, interpersonal, economic, uncertainty, societal disarray, resource scarcity, and government/media responses. The prevalence of each of these worries varied over the first 30 days of the pandemic, with three worries predicting concurrent and subsequent mental health. Health worries were associated with elevated general and event-specific distress within the acute phase of the crisis, and economic and scarcity worries were related to greater distress during the first month and six months later, respectively. These findings revealed the multifaceted nature of this unique collective trauma; implications for theory and public health are discussed.



One event as many stressors: COVID-related worries and general and event-specific distress

Whereas Chapters 2 and 3 assessed event framing and mental health outcomes in response to acute stressors, Chapter 4 explored these processes in the context of a chronic, ongoing stressful event: the COVID-19 pandemic. In the previous two studies, the duration of the collective stressful events under study was brief; both the Ford-Kavanaugh hearings and the Boston Marathon bombings themselves lasted a matter of minutes or hours. In the case of the COVID-19 public health crisis, however, the event has persisted for over two years with an indeterminate end. The enduring nature of this event has provided a unique opportunity to examine psychological responses both over the course of its extended “acute” period and in the years that followed as cases and restrictions have fluctuated. By examining framing at three timepoints over the first 30 days of the pandemic, this study further explored the dynamic process of framing as the event unfolded and assessed the relationship between framing and emotional responses both cross-sectionally and longitudinally.

From the first confirmed COVID-19 case in the United States on January 21, 2020, the coronavirus outbreak rapidly developed and dramatically changed the lives of many Americans. After then-President Donald Trump declared this outbreak first a public health emergency then a national emergency, state and local governments began effecting social distancing policies, issuing stay-at-home orders, and shutting schools, community centers, and nonessential businesses. Despite being first and foremost a public health crisis, the COVID-19 outbreak also precipitated unprecedented layoffs and economic instability and restricted social and community gatherings, among other innumerable societal disruptions. Given the all-encompassing and far-reaching nature of the outbreak, especially in the early days of this crisis, it is possible that people may not have framed it primarily as a health event or in the same way over time. Instead,

they may have framed it in terms of one or more of its secondary consequences that shifted as the situation developed. In this way, people may have framed this collective stressful event in terms of these dynamic secondary pandemic-related issues and concerns, which may have then shaped their concurrent and subsequent emotional responses to the COVID-19 pandemic.

A substantial body of work has documented the well-being and mental health implications of different types of psychological stressors. For example, everyday interpersonal (Bolger et al., 1989), home (Neupert et al., 2007), network (Almeida et al., 2002), work or financial (Sturgeon et al., 2016), and health (Almeida, 2005) stressors have all been linked to greater psychological distress and poorer psychological well-being. Similar associations between types of stressors and mental health outcomes have also been found in studies of negative life events, demonstrating the adverse mental health outcomes associated with bereavement (Stroebe et al., 2007), job loss or unemployment (Paul & Moser, 2009), and serious injury or illness (Post & van Leeuwen, 2012; Zabora et al., 2001). While this literature has thoroughly examined the psychological outcomes associated with distinct types of stressors, scant work has assessed framing a single stressful event as different types of stressors or how those stressor framings may shift over time as the event unfolds (Garfin et al., 2014; Kessler et al., 2012). Given its unusual scope and ever-evolving nature, the COVID-19 pandemic represents a uniquely well-suited event for testing these questions.

One way to assess how people are framing an ongoing event as a stressor may be to examine their greatest event-related worries. Worries are considered to be a form of perseverative cognition, which is defined as “the repeated or chronic activation of the cognitive representation of one or more psychological stressors” (Brosschot et al., 2006). Worries reflect perceptions of current or future threats that demand priority and attention and mobilize problem-

solving efforts to neutralize potential danger (Hirsch & Mathews, 2012; Tallis & Eysenck, 1994). Because worries convey personally urgent stressors, people's specific worries about an event likely indicate which aspects of that event they regard as the most threatening and, thus, represent their primary event-related stressors. Thus, assessing event-related worries may be an effective method by which to provide insight into how people frame an event as a stressor.

Just as general event framings have been related to emotional responses (Ellsworth, 2013; Moors et al., 2013), worries have been linked to adverse mental health outcomes. There is considerable evidence that worry and other forms of repetitive thought are consistently associated with depression and anxiety disorders (see Watkins, 2008, for a review) and that event-related worries in the wake of stressful events, such as the Boston Marathon bombings, have been related to greater functional impairment (Holman et al., 2020) and posttraumatic stress symptoms (Holeva et al., 2001). These findings support the notion that worries about the COVID-19 outbreak will likely be related to general and event-specific emotional responses in both the short-term and six months later. However, most studies to date have considered only the presence and intensity of worries in the context of stressful events, not their content or indication of perceived stressors, so it is therefore unclear how various event-related worries may be associated with mental health outcomes or which specific worries may be most significant for well-being.

To address these empirical gaps, this study examined stressor framings of a collective stressful event, the COVID-19 pandemic, as it unfolded and tested how these framings were associated with acute and subsequent mental health outcomes. By assessing stressor framings, as measured by event-specific worries, at several timepoints during the early days of the event, this study explored how people framed this stressor at various times as the stressful event developed.

This present study also examined the durability of the relationship between stressor framings and emotional responses by testing it both cross-sectionally and longitudinally. It was hypothesized that people would offer diverse framings of this stressor related to current events, that prevalence of those framings would change as the situation evolved, and that framings would differentially relate to concurrent and subsequent general and event-specific distress.

## **Method**

### **Design and Sample**

To conduct this study, our research team collaborated with NORC, a nonprofit survey organization at the University of Chicago, to administer a longitudinal, multi-wave survey assessing concurrent and subsequent responses to the COVID-19 pandemic. NORC uses area probability sampling to select and recruit individuals within U.S. households to join the AmeriSpeak panel, a nationally representative panel of American adults. Participants in the current study were Web-enabled panelists who were invited and agreed to participate in confidential, online surveys about the COVID-19 pandemic at both Waves 1 and 2. Wave 1 data ( $N = 6,514$ ) were collected between March 18 and April 18, 2020, within three, 10-day collection periods. The first cohort ( $n = 2,122$ ; 57.2% participation rate) received and completed the survey between March 18 and 28, 2020. Participants in the second cohort ( $n = 2,234$ ; 60.2% participation rate) received an invitation to participate on March 29, 2020 and were able to complete the survey until April 7, 2020. The third and final cohort ( $n = 2,158$ , 58.1% participation rate) provided data between April 8 and 18, 2020. This data collection design was used to capture early psychological responses at various timepoints throughout the evolution of this ongoing public health crisis. Wave 2 data ( $n = 5,661$ , 87.1% participation rate) were

collected from Wave 1 panelists who were still available to complete a survey 5-6 months later, between September 26, 2020 and October 16, 2020.

## **Measures**

### ***Demographics and Mental Health History***

Participants provided demographic (including age, gender, ethnicity, household income, educational attainment, geographic region of residence, political party affiliation) and prior mental health information upon entry to the AmeriSpeak panel, prior to data collection on COVID-19. Participants indicated whether they had ever been previously diagnosed with anxiety, depression, or some other psychiatric problem. Responses were dichotomously coded such that an affirmative response to any prior mental health diagnosis was scored as a 1 (all others coded 0).

### ***Wave 1 Personal Exposure to COVID-19***

The degree to which participants were exposed to the COVID-19 pandemic at Wave 1 was assessed using a checklist that inquired about both direct and indirect forms of personal exposure (Holman et al., 2020). Respondents indicated whether they or a close other had experienced 10 occurrences (e.g., I/someone close to me was diagnosed with coronavirus). Responses were summed to create a total count of personal exposures; however, due to the highly skewed nature of these data, these scores were dichotomized for analyses (0 = no personal exposures, 1 = at least one personal direct/indirect exposure).

### ***Wave 2 Direct Exposure to COVID-19***

The extent to which participants had been directly exposed to COVID-19 at Wave 2 was measured using one item. To assess direct exposure to the COVID-19 disease, participants indicated which of five descriptions best characterized their experience with COVID-19,

including not having contracted COVID-19, having contracted COVID-19 with no or mild symptoms, having been very sick but not hospitalized with COVID-19, having been hospitalized with COVID-19 but not on a ventilator, and having been on a ventilator because of COVID-19. Because almost all participants (95.41%) indicated that they had not had COVID-19 at this time, responses were dichotomized for analyses (0 = no direct exposure, 1 = any form of direct exposure).

### ***Wave 2 Indirect Exposure to COVID-19***

The degree to which participants were indirectly exposed to COVID-19 at Wave 2 was assessed using two items. Participants indicated how many (1) family members or close friends and (2) people they knew personally besides family and friends who had contracted COVID-19 on a discrete numerical scale with 11 response options ranging from 0 to 10+. Responses to these two items were summed to create a total number of people personally known to participants who contracted COVID-19 at Wave 2.

### ***Waves 1 and 2 Media Exposure to the COVID-19 Pandemic***

The amount of media coverage of the COVID-19 pandemic to which participants were exposed was measured at both Waves 1 and 2. Participants reported the average number of hours per day (0 to 11+) that they spent in the previous week engaging with each of three sources of media coverage about the pandemic, including traditional media (i.e., TV, radio, and print news), online news, and social media (e.g., Facebook, Reddit, and Twitter). Responses were summed to create the total number of daily hours spent exposed to media coverage about the COVID-19 pandemic across all three media sources at Waves 1 and 2. Scores were capped at 33 to account for engagement across multiple media sources simultaneously.

### ***Open-Ended Worry***

At Wave 1, participants were provided the opportunity to share their greatest worries regarding the COVID-19 pandemic. Using a single open-ended question, participants were asked, “If you are worried about the Coronavirus outbreak, what is causing you the most concern?” Responses were provided in a text box with no character limit so that participants could share as much as they wished. Responses to the open-ended worry question were coded to create several variables that captured (a) the total length of a response (in words), (b) whether responses contained each of the worries identified through theme extraction, and (c) the total number of worries mentioned in each response.

### ***Acute Stress Responses to the COVID-19 Pandemic***

Acute stress responses were assessed at Wave 1 using an adapted version of Acute Stress Disorder Scale-5 (Bryant, 2016). Respondents used a 5-point Likert-type scale ranging from 1 (*not at all*) to 5 (*a great deal*) to indicate the extent to which they experienced each of 10 possible reactions to the COVID-19 pandemic in the past week, including symptoms of dissociation and intrusive thoughts. Responses were averaged to capture the severity of acute stress responses and demonstrated good internal consistency ( $\alpha = 0.86$ ).

### ***Posttraumatic Stress Responses to the COVID-19 Pandemic***

Posttraumatic stress responses to the COVID-19 pandemic were assessed 5-6 months after the onset of the pandemic at Wave 2 using the Primary Care – PTSD Screen for DSM-5 (PC-PTSD-5; Prins et al., 2015). The PC-PTSD-5 contains 5 items designed to identify hallmark symptom clusters of PTSD (i.e., re-experiencing, avoidance, numbing, and hyperarousal) and trauma-specific guilt and blame. Participants indicated how much in the past week they had experienced each symptom on a 5-point scale (1 = *not at all* to 5 = *a great deal*). Responses were averaged and showed good reliability ( $\alpha = 0.83$ ).

### ***Psychological Distress***

General psychological distress was measured at both Waves 1 and 2 using the Brief Symptom Inventory-18 (BSI-18; Derogatis, 2001). At Wave 1, participants reported the degree to which they were distressed or bothered by each of 18 symptoms of depression, anxiety, and somatization in the past week using a 5-point scale (1 = *not at all* to 5 = *extremely*). At Wave 2, respondents completed an abbreviated version of the BSI-18 and indicated the extent to which they had experienced each of 9 symptoms using the same 5-point scale. Responses were averaged to create composite scores representing the severity of participants' general psychological distress with excellent internal consistency at both Waves 1 ( $\alpha = 0.92$ ) and 2 ( $\alpha = 0.89$ ).

### **Data Analysis**

#### ***Qualitative Analysis***

Participants' greatest COVID-19-related worries were identified using a grounded theory approach (Strauss & Corbin, 1990). Four coders independently reviewed a random subset of 450 open-ended responses collected at Wave 1 (150 responses per cohort) to identify and compile a list of commonly mentioned worries. The coders then reviewed and discussed their individual lists to jointly create a final list of worries that all coders agreed best captured the most common COVID-19-related worries mentioned by participants. This final list of worries was then used to create codebooks for identifying each theme in a given response. Using this codebook, two independent coders each coded a random selection of 1,000 open-ended responses to indicate whether each worry was mentioned (1) or not mentioned (0). Each response could contain multiple worries so coders were instructed to code for the presence of every worry contained in a response. Interrater reliability was calculated to assess agreement between each set of codes.



Coders were considered to be in agreement if all codes for each worry matched for a given response. Coders demonstrated acceptable interrater reliability with 95% agreement ( $\kappa = 0.81$ ). Once the coders completed their independent coding, they discussed and resolved all discrepancies to create one final set of codes for all responses.

### ***Quantitative Analysis***

Once the open-ended worry responses were coded for presence or absence of each worry, four sets of analyses were conducted to assess (1) the prevalence of each worry within the entire sample, (2) whether the prevalence of each worry differed across the three Wave 1 cohorts, and (3) whether individual worries were uniquely associated with contemporaneous acute stress responses and global distress, and (4) whether individual worries prospectively predicted posttraumatic stress and global distress 5-6 months later. These analyses examined how people framed the COVID-19 pandemic as a stressor at various timepoints within the acute phase of the event and the role of these framings in shaping concurrent and subsequent emotional responses.

First, descriptive analyses were conducted to determine the percentage of participants that expressed each individual worry, both across the entire sample and within each of the three Wave 1 cohorts. By examining the prevalence of worries by cohort, I aimed to capture the type of stressor that the COVID-19 pandemic represented for different participants and whether that event framing evolved as the event unfolded and developed. Next, two multivariate Ordinary Least Squares (OLS) regression models were conducted to assess whether COVID-19 worries were differentially associated with acute stress responses and psychological distress, controlling for cohort, demographics, prior mental health, Wave 1 personal exposure to COVID-19, Wave 1 COVID-19-related media exposure, and total word count from open-ended responses. Finally, two multivariate OLS regression models were used to analyze whether Wave 1 worries predicted

Wave 2 posttraumatic stress and general psychological distress five to six months later, controlling for the same covariates with Wave 2 direct and indirect exposure to COVID-19. All regression models were Bonferroni-adjusted to account for multiple familywise comparisons.

## **Results**

The sample in this study was restricted to those participants who provided open-ended responses about their greatest worry related to the COVID-19 pandemic and whose responses were coded for specific COVID-19-related worries. Thus, the 1,000 participants who indicated their greatest COVID-19-related worry and were randomly selected for coding were eligible for inclusion in the present analysis. Only cases with complete data on all variables in our models were included in these analyses, given the use of listwise deletion for multiple linear regression models. Therefore, the final sample size was 996 for analyses using only Wave 1 variables and 869 for analyses using variables collected at Waves 1 and 2, due to some attrition over time.

The final sample ( $N = 996$ ) was 59.24% female, ranged in age from 19 to 92 ( $M = 51.47$ ,  $SD = 16.70$ ) with a racial/ethnic composition of 77.31% White (non-Hispanic), 9.04% Hispanic, 7.33% Black (non-Hispanic), and 6.33% other/2+ races/ethnicities (non-Hispanic). Participants were drawn roughly evenly across the three Wave 1 cohorts, with 33.43% of participants from Cohort 1, 33.84% from Cohort 2, and 32.73% from Cohort 3. About half (47.39%) had earned a bachelor's degree or higher and 62.55% had an annual income of \$50,000 or more. Participants reported residing primarily in the South (30.12%) and the West (29.02%), with the remainder in the Midwest (25.10%) and the Northeast (15.76%). Political party affiliation varied but most participants identified to some degree as a Democrat (46.59%) or Republican (40.16%), with a minority identifying as neither/independent (13.25%). About 18% of the sample reported a prior diagnosis of either depression or anxiety, with the remaining 81.83% indicating that they had no

such prior history. At Wave 1, only 24% of participants reported any direct or indirect exposure to COVID-19, but by Wave 2, roughly 5% of participants reported having had personally contracted the virus and 68.08% of participants reported personally knowing at least one person who had contracted the virus. Participants reported being exposed to an average of 6.46 hours per day ( $SD = 6.17$ ) of COVID-19-related media at Wave 1 and 4.24 hours per day ( $SD = 4.58$ ) at Wave 2. Participants' responses contained 19.53 words on average ( $SD = 29.12$ ) but ranged in length from 1 to 293 words.

### **Qualitative Results**

Qualitative analysis of a subset of open-ended responses provided by 1,000 participants who specified their greatest worries related to the COVID-19 pandemic revealed seven themes: (1) health-related concerns, (2) concern for others, (3) concerns regarding personal finances and/or macro-level economics, (4) concerns surrounding resource scarcity, (5) fears about social disarray, (6) worry about the government and media response, and (7) fear about the uncertainty surrounding the COVID-19 pandemic.

#### ***Health-Related Worries***

Respondents expressed concerns about their own and others' health and well-being with regard to the COVID-19 pandemic. Participants reported feeling fearful of the toll that the pandemic might take on their and others' physical and mental health. Specific worries that fell within this category included but were not limited to worries about being exposed to the virus, the virus spreading, illness progression if infected, asymptomatic transmission of the virus, death, and depression. For example, one participant wrote, "I fear that myself & my family could get sick & even die. I fear that too many people will get sick & die. I'm fearful for all of us & terrified this pandemic could devastate our world."

### ***Interpersonal Concern***

Another worry among participants was about how the COVID-19 pandemic will adversely impact known and unknown others. Participants expressed concerns for the welfare of others, including but not limited to family, friends, romantic partners, neighbors, members of their community, and members of vulnerable or disadvantaged groups (e.g., elderly, immunocompromised, unhoused, low-income). Two exemplar responses are, “Concerned about others. I have a friend having surgery on Tuesday. Some family members are still working” and “My children and grandmother.”

### ***Financial/Economic Worries***

A COVID-19-related worry among our sample pertained to individual- and group-level finances. Respondents voiced concerns about how the COVID-19 pandemic may negatively impact the financial security and employment status of themselves and their families as well as the national and global economy and stock market. For example, one respondent wrote, “Long term economic health of my community and my country. I’m afraid there will be a domino effect of many workers lose their jobs. Somewhat concerned about retirement investments.”

### ***Fear of Resource Scarcity***

Participants in our sample expressed concerns about their ability to access basic necessities and essential services in the wake of the COVID-19 pandemic. Respondents referenced the scarcity of essential consumer products, such as food and health-protective supplies (e.g., face masks, hand sanitizer), and the disruption to the provision of services like education and healthcare. An example response is, “The lack of needed essentials like food, medicines, and paper goods at stores.”

### ***Fear of Social Disarray***

Another worry shared by participants was fear about extreme nonnormative behaviors and reactions of other people in response to the COVID-19 pandemic. Respondents conveyed concerns about societal disarray and chaos stemming from the breakdown of social norms during this uncertain time. Participants referenced various emotional and behavioral responses, such as intense panic/fear, hoarding, criminal activity, social unrest, and violation of government-issued mandates (e.g., curfews, mask mandates, social distancing). Some examples of responses containing this theme are, “The panic of the public. The hoarding and the fear.” and “Civil unrest because this situation has really brought out the inequity in our society.”

### ***Worry about the Government and Media Response***

Respondents expressed worry about the handling and portrayal of the COVID-19 pandemic by government institutions and media organizations. For example, participants described concerns about the federal government’s response to and the news media’s coverage of COVID-19-related updates, with specific fears pertaining to the implementation and constitutionality of public health policies (e.g., stay-at-home orders, mask mandates), the clarity and transparency of communication from government officials, and the competence of political leaders to respond appropriately to the public health crisis. Two responses containing these worries are, “The control the government has taken, the hype the media is doing causing people to panic,” and “The media and it’s hyper, overstated reporting. Reporting what may happen vs what is actually happening. Fueling over buying. Criticizing the President and efforts made to protect the country. Just can’t believe what is being reported.”

### ***Worry about the Uncertainty of the COVID-19 Pandemic***

A final concern conveyed by our sample was worry about the uncertainty and lack of information surrounding the COVID-19 pandemic. Participants reported feeling concerned about

the unknowns related to virus transmission, risk of infection/illness, long-term health implications of contracting the virus, the duration of the COVID-19 pandemic, and the potential impact of the COVID-19 pandemic on jobs, education, travel, and the future in general. An example of such responses included, “The unknown; the uncertainty. Every aspect of daily living is changing daily, or hourly and it leads to quite a bit of unanswered questions.”

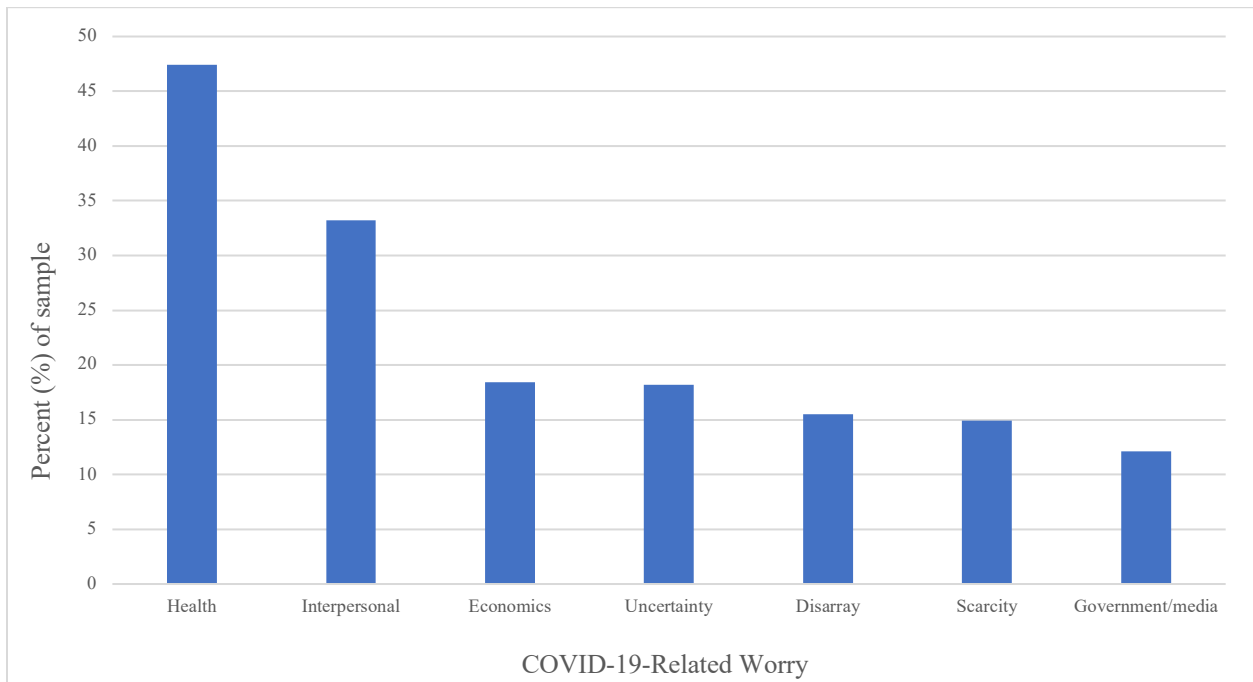
## **Quantitative Results**

### ***Prevalence of COVID-19-Related Worries Across and Within Cohorts***

The percentage of the sample that reported each COVID-19-related worry across all Wave 1 cohorts are presented in Figure 1. Of the seven major worries expressed by participants in our sample, health-related concerns were the most commonly reported COVID-19-related worry across all Wave 1 cohorts. About half (47%) of the 1,000 participants whose open-ended responses were analyzed indicated some worry regarding the physical and mental health implications of the COVID-19 pandemic, either from contracting the virus itself or from enduring the stress and restrictions resulting from this public health crisis. About a third of the Wave 1 sample (33.2%) expressed concerns about others and their welfare during the COVID-19 pandemic, and roughly 18% reported worries related to financial impacts (18.4%) and the general uncertainty of the situation (18.2%). A minority of participants conveyed the remaining three worries. About 15.5% of Wave 1 participants reported feeling concerned about social disarray and disruptive nonnormative behavior as a result of the COVID-19 pandemic. Roughly 14.9% of respondents worried about basic goods and essential services becoming scarce or inaccessible and about 12.1% of participants shared experiencing fears about the government handling and media coverage of the COVID-19 pandemic.

**Figure 1**

Prevalence of COVID-19-Related Worries Across All Wave 1 Cohorts

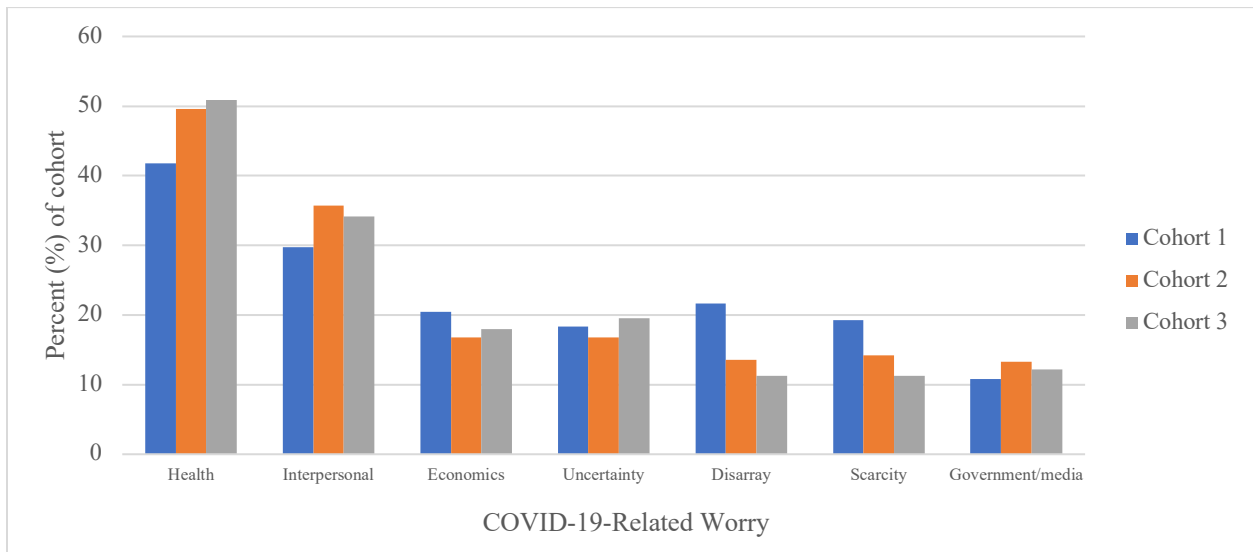


The percentage of each Wave 1 cohort that reported each COVID-19-related worry are presented in Figure 2. When comparing the prevalence of COVID-19-related worries by Wave 1 cohort, several patterns emerged (see Figure 2). The prevalence of health, interpersonal, and government/media-related worries increased over time; more participants in Cohorts 2 (health: 49.6%; interpersonal: 35.7%; government/media: 13.3%) and 3 (health: 50.9%; interpersonal: 34.2%; government/media: 12.2%) mentioned these worries than participants in Cohort 1 (health: 41.7%; interpersonal: 29.7%; government/media: 10.8%), suggesting that these concerns became more salient as the COVID-19 pandemic continued to unfold. In contrast, several worries were mentioned less frequently by later than earlier cohorts. For example, more participants in Cohort 1 expressed worries about finances/economics (20.4%), social disarray (21.6%), and resource scarcity (19.2%) than did participants in Cohorts 2 (economics: 16.8%;

disarray: 13.6%; scarcity: 14.2%) and 3 (economics: 18.0%; disarray: 11.3%; scarcity: 11.3%), indicating that these concerns were highest at the onset of this public health crisis but became less salient as the pandemic progressed. The pattern for the mention of the remaining worry, concerning the uncertainty surrounding the COVID-19 pandemic, differed in that it fluctuated from cohort to cohort. The percentage of participants in Cohort 2 who shared concerns about uncertainty (16.8%) was lower than the percentage of Cohort 1 participants who expressed this worry (18.3%); however, the prevalence of this worry increased from Cohort 2 to 3, with participants in Cohort 3 (19.5%) indicating greater worry about uncertainty than participants in both Cohorts 1 and 2.

**Figure 2**

Prevalence of COVID-19-Related Worries by Wave 1 Cohort



***COVID-19-Related Worries and Concurrent Mental Health Outcomes***

Results from the multivariate OLS regression models predicting COVID-19-related acute stress responses and psychological distress at Wave 1 are presented in Table 1. Two of the seven



COVID-19-related worries shared by participants were found to be significantly associated with concurrent mental health outcomes when entered simultaneously into the models. Describing health-related concerns as one's greatest worry pertaining to the COVID-19 pandemic was related to greater COVID-19-related acute stress ( $B = .11, p = .002$ ) and greater global psychological distress ( $B = .11, p = .001$ ). Mention of financial/economic worries related to the COVID-19 pandemic was also significantly associated with greater global psychological distress ( $B = .08, p = .010$ ) but not acute stress ( $p > .0125$ ). All other COVID-19-related worries were not statistically significant predictors of event-specific acute stress or psychological distress above and beyond cohort, demographics, prior mental health history, personal and media-based exposures, and total word count ( $ps > .0125$ ).

**Table 1**Predictors of Wave 1 COVID-19-Related Acute Stress and Psychological Distress ( $N = 996$ )

Predictor Variable	COVID-19-Related Acute Stress		Psychological Distress	
	<i>b</i> (95% CI)	<i>B</i>	<i>b</i> (95% CI)	<i>B</i>
Cohort				
Cohort 2 (3/29-4/7)	0.01 (-0.08, 0.11)	0.01	0.01 (-0.06, 0.07)	0.00
Cohort 3 (4/8-4/18)	0.10 (-0.01, 0.19)	0.07	0.06 (-0.00, 0.13)	0.06
Age	-0.01 (-0.01, -0.01)	-0.18**	-0.00 (-0.01, -0.00)	-0.11**
Gender (Female)	0.20 (0.12, 0.29)	0.15**	0.11 (0.05, 0.17)	0.11**
Race/ethnicity				
Black, non-Hispanic	-0.08 (-0.24, 0.08)	-0.03	-0.16 (-0.28, -0.04)	-0.08*
Hispanic	0.20 (0.05, 0.34)	0.08*	0.14 (0.04, 0.24)	0.08*
Other, non-Hispanic	-0.13 (-0.29, 0.03)	-0.05	-0.08 (-0.20, 0.03)	-0.04
Education				
High school	-0.16 (-0.42, 0.09)	-0.08	0.12 (-0.06, 0.30)	0.08
Some college	-0.09 (-0.33, 0.15)	-0.07	0.13 (-0.04, 0.31)	0.13
Bachelor's or more	-0.09 (-0.33, 0.15)	-0.07	0.12 (-0.05, 0.29)	0.12
Income	0.01 (-0.02, 0.03)	0.02	-0.01 (-0.02, 0.01)	-0.02
Region				
Midwest	0.01 (-0.11, 0.13)	0.01	-0.01 (-0.09, 0.08)	-0.00
South	-0.08 (-0.20, 0.04)	-0.06	-0.03 (-0.11, 0.06)	-0.02
West	0.03 (-0.09, 0.15)	0.02	0.02 (-0.07, 0.11)	0.02
Political affiliation	-0.04 (-0.06, -0.02)	-0.12**	-0.03 (-0.04, -0.02)	-0.12**
Prior mental health	0.24 (0.14, 0.34)	0.13**	0.28 (0.20, 0.35)	0.22**
W1 personal exposure	0.12 (0.03, 0.22)	0.08*	0.14 (0.07, 0.21)	0.12**
W1 media exposure	0.02 (0.01, 0.03)	0.18**	0.01 (0.01, 0.02)	0.16**
Total word count	-0.00 (-0.00, 0.00)	-0.00	0.00 (-0.00, 0.00)	0.00
Health	0.15 (0.05, 0.24)	0.11*	0.11 (0.04, 0.18)	0.11*
Interpersonal	0.04 (-0.05, 0.14)	0.03	0.01 (-0.06, 0.08)	0.01
Economics	0.08 (-0.03, 0.18)	0.04	0.10 (0.02, 0.18)	0.08*
Scarcity	0.05 (-0.06, 0.16)	0.03	0.08 (-0.00, 0.16)	0.06
Disarray	0.07 (-0.05, 0.18)	0.04	0.05 (-0.03, 0.13)	0.04
Government/media	0.05 (-0.08, 0.18)	0.02	0.01 (-0.08, 0.10)	0.01
Uncertainty	0.11 (0.01, 0.22)	0.06	0.05 (-0.03, 0.12)	0.04
Constant	1.97 (1.64, 2.30)		0.34 (0.10, 0.58)	
Model statistics	$F(26, 969) = 10.67^{***}$ $R^2 = 0.22$		$F(26, 969) = 11.25^{***}$ $R^2 = .23$	

Note: Table presents both standardized (*B*) and unstandardized (*b*) regression coefficients. Mental health was coded as follows: 0 = no anxiety or depression diagnoses, 1 = at least one diagnosis for either anxiety or depression. The reference groups for cohort, gender, race/ethnicity, education, and region were Cohort 1 (3/18-3/28), males, White/non-Hispanic, "less than high school," and Northeast, respectively. Political affiliation was coded such that lower scores reflect a stronger affiliation with the Democratic party. Bonferroni-adjusted significance threshold is .0125. \* $p < .0125$ ; \*\* $p < .001$

### ***COVID-19-Related Worries and Prospective Mental Health Outcomes***

Table 2 presents results from multivariate OLS regression analyses examining predictors of COVID-19-related posttraumatic stress responses and global psychological distress at Wave 2. Adjusting for cohort, demographics (age, gender, race/ethnicity, education, income, geographic region, political affiliation), current direct, indirect, and media-based exposures, and total response length, only one COVID-19-related worry expressed at Wave 1 was significantly associated with mental health responses at Wave 2. Expressing worry about the scarcity of basic goods and services in the early days of the COVID-19 pandemic was related to greater global psychological distress five to six months later ( $B = .11, p < .001$ ), but not COVID-19-related posttraumatic stress ( $p > .0125$ ). All remaining COVID-19-related worries were not significantly associated with Wave 2 general and event-specific mental health outcomes, controlling for the covariates and other COVID-19-related worries.

**Table 2**Predictors of Wave 2 COVID-19-Related Posttraumatic Stress ( $N = 868$ ) and PsychologicalDistress ( $N = 869$ )

Predictor Variable	COVID-19-Related Posttraumatic Stress		Psychological Distress	
	<i>b</i> (95% CI)	<i>B</i>	<i>b</i> (95% CI)	<i>B</i>
<b>Cohort</b>				
Cohort 2 (3/29-4/7)	0.05 (-0.06, 0.17)	0.03	0.02 (-0.07, 0.12)	0.02
Cohort 3 (4/8-4/18)	0.18 (0.06, 0.30)	0.11*	0.10 (-0.00, 0.20)	0.07
Age	-0.00 (-0.01, -0.00)	-0.07	-0.00 (-0.01, -0.00)	-0.09*
Gender (Female)	0.18 (0.08, 0.28)	0.11*	0.11 (0.02, 0.19)	0.08
<b>Race/ethnicity</b>				
Black, non-Hispanic	-0.19 (-0.40, 0.03)	-0.06	-0.26 (-0.44, -0.08)	-0.09*
Hispanic	0.15 (-0.03, 0.34)	0.05	0.02 (-0.13, 0.17)	0.01
Other, non-Hispanic	0.19 (-0.02, 0.39)	0.06	-0.07 (-0.25, 0.10)	-0.03
<b>Education</b>				
High school	-0.14 (-0.46, 0.18)	-0.06	-0.14 (-0.41, 0.13)	-0.07
Some college	-0.09 (-0.40, 0.21)	-0.06	-0.14 (-0.39, 0.12)	-0.10
Bachelor's or more	-0.10 (-0.40, 0.21)	-0.06	-0.12 (-0.37, 0.13)	-0.09
Income	-0.00 (-0.03, 0.03)	-0.00	-0.02 (-0.05, 0.00)	-0.06
<b>Region</b>				
Midwest	0.01 (-0.14, 0.17)	0.01	-0.13 (-0.26, -0.00)	-0.08
South	0.01 (-0.14, 0.16)	0.00	-0.09 (-0.22, 0.03)	-0.06
West	0.01 (-0.13, 0.16)	0.01	-0.01 (-0.14, 0.11)	-0.01
Political affiliation	-0.07 (-0.09, -0.04)	-0.17**	-0.04 (-0.06, -0.02)	-0.13**
Prior mental health	0.26 (0.14, 0.39)	0.13**	0.38 (0.27, 0.49)	0.22**
W2 direct exposure	-0.04 (-0.27, 0.19)	-0.01	0.16 (-0.04, 0.35)	0.05
W2 indirect exposure	0.01 (-0.01, 0.02)	0.04	0.01 (-0.00, 0.02)	0.04
W2 media exposure	0.05 (0.04, 0.06)	0.28**	0.04 (0.03, 0.05)	0.26**
Total word count	0.00 (-0.00, 0.00)	0.03	0.00 (-0.00, 0.00)	0.04
Health	0.09 (-0.03, 0.20)	0.06	0.06 (-0.04, 0.16)	0.05
Interpersonal	0.03 (-0.09, 0.15)	0.02	-0.02 (-0.12, 0.08)	-0.01
Economics	0.07 (-0.06, 0.20)	0.03	0.09 (-0.02, 0.20)	0.05
Scarcity	0.14 (0.00, 0.28)	0.06	0.21 (0.09, 0.32)	0.11**
Disarray	0.10 (-0.04, 0.24)	0.04	0.04 (-0.07, 0.16)	0.02
Government/media	-0.01 (-0.18, 0.15)	-0.01	-0.03 (-0.17, 0.10)	-0.02
Uncertainty	0.03 (-0.10, 0.16)	0.01	-0.01 (-0.12, 0.10)	-0.00
Constant	1.67 (1.25, 2.10)		0.85 (0.50, 1.20)	
Model statistics	$F(27, 840) = 9.27^{***}$ $R^2 = 0.23$		$F(27, 841) = 10.33^{***}$ $R^2 = .25$	

Note: Table presents both standardized (*B*) and unstandardized (*b*) regression coefficients. Mental health was coded as follows: 0 = no anxiety or depression diagnoses, 1 = at least one diagnosis for either anxiety or depression. The reference groups for cohort, gender, race/ethnicity, education, and region were Cohort 1 (3/18-3/28), males, White/non-Hispanic, "less than high school," and Northeast, respectively. Political affiliation was coded such that lower scores reflect a stronger affiliation with the Democratic party. Bonferroni-adjusted significance threshold is .0125. \* $p < .0125$ ; \*\* $p < .001$

## Discussion

Findings from this study revealed that the COVID-19 pandemic was framed as many different types of stressors. As expected for a public health crisis, the COVID-19 pandemic was framed primarily as a health stressor; however, this event also induced worry about a variety of other topics unrelated to physical or mental health. Respondents in this sample expressed concerns about the welfare of others, individual- and macro-level financial fallout, restrictions in obtaining essential goods and services, societal chaos and disarray, the government and media response, and the overall uncertainty of the situation. Thus, as predicted, participants' greatest worries about the COVID-19 pandemic reflected a range of concerns beyond its health implications, suggesting that people were indeed framing this event in terms of its secondary stressors in addition to its primary event-related consequences. This finding is consistent with prior work on individual variability in appraisals of potentially stressful events (Power & Hill, 2010), demonstrating further evidence that individuals differ in their evaluations of what the most threatening aspect of a situation is and suggesting that secondary stressors may be useful to consider when examining how people frame collective stressful and traumatic events.

Results from the present study also revealed that the prevalence of individual worry framings shifted as the COVID-19 pandemic evolved, aligning with event developments; health- and interpersonal-related concerns increased along with case and death counts, whereas fears about economic collapse, social disarray, and resource scarcity declined as financial markets stabilized, chaos failed to materialize, and basic goods became more widely available again. These fluctuations in the prevalence of COVID-19-related worries across the three Wave 1 cohorts suggest that framings of the pandemic were dynamic, shifting to reflect evaluations of

the most salient threats pertaining to the event at the time of survey completion, consistent with appraisal theories (Moors et al., 2013).

The current study found partial support for the cross-sectional and longitudinal links between framings of a collective traumatic event and general and event-specific distress. Several of the worry framings identified in the present work significantly predicted acute stress and posttraumatic stress responses to the COVID-19 pandemic and global psychological distress six months later. Individuals who framed the COVID-19 pandemic as a health stressor reported greater concurrent COVID-19-related acute stress and global psychological distress, and individuals who framed the pandemic as a financial stressor reported feeling more globally distressed at Wave 1. This finding replicates patterns found in prior work linking health anxiety (Deimling et al., 2017; Sunderland et al., 2013) and financial stress (Sturgeon et al., 2016) to psychological distress and well-being. In addition, framing the COVID-19 pandemic in terms of worries about resource scarcity at Wave 1 predicted greater global psychological distress 5-6 months later, similar to related work on resource shortage-related worries and COVID-19-related anxiety (David et al., 2021).

This study contributes to an emerging body of work shedding light on the mental health implications of worries in the context of collective trauma and offers a new conceptualization of worries as framings that can reveal what people perceive to be the most threatening aspect of a negative life event. Event-specific worry about ongoing crises has been linked to heightened depression, anxiety, and posttraumatic stress symptoms (e.g., Liu et al., 2020), and worries about reexperiencing the similar type of collective traumatic event in the future are similarly associated with maladaptive posttraumatic responding (e.g., Thompson et al., 2019). While these studies have established the link between intensity of overall event-related worry and posttraumatic

mental health outcomes, no work has yet explored the predictive value of specific event-related worries and how worries pertaining to unique aspects of the event may differentially predict emotional responses in its aftermath. The COVID-19 pandemic provided a unique opportunity to explore worries as event framings because it was (and continues to be) an all-encompassing, chronic collective traumatic event that impacted nearly every aspect of life during the early days of the pandemic, thereby representing numerous different types of stressors within the context of a public health crisis that could shift as the event unfolded. Although collective traumatic events of the magnitude and scale of the COVID-19 pandemic are rare, insights gained from studying framings of and emotional responses to this unique event can contribute to our understanding of coping and adjustment processes for chronic traumas that evolve over time. Given that individuals with a history of chronic trauma exposure have been found to experience more severe (Cloitre et al., 2013) and enduring posttraumatic maladjustment (Simon, 1999), expanding our knowledge about factors that exacerbate maladaptive emotional responding following chronic collective trauma may be particularly significant to buffer distress and bolster mental health in this highly impactful context.

While these findings provide some support for the cross-sectional and longitudinal links between collective traumatic event framing and posttraumatic emotional responses, we acknowledge several limitations. Only three of the seven COVID-19-related worries (health, economics, scarcity) were significantly associated with general and event-specific distress at Waves 1 and 2, with no statistically significant relationships with mental health outcomes detected for the remaining four worries (interpersonal, disarray, government/media, uncertainty) at either time point. One possible explanation for some or all of these null effects is multicollinearity; it is plausible that some or all of the COVID-19-related worries are highly

interrelated and, thus, explain much of the same shared variance of the outcome variables. A post-hoc examination of the tetrachoric correlations between all seven COVID-19-related worries reveals that several of the worries are indeed highly correlated (see Appendix). Given the interrelatedness of the COVID-19-related worry variables, it is likely that few worries explained enough unique variance to be detected as significant predictors, resulting in null findings. To avoid this statistical problem in future research, researchers should consider using clustering techniques to group worries that co-occur. That way, worries that explain much shared variance can be combined into worry “profiles” to better capture the multifaceted nature of collective traumatic event framings and explain more unique variance of posttraumatic mental health outcomes. This technique has been proposed as one possible solution to multicollinearity in regression models (Curtis & Ghosh, 2011) and may benefit future researchers seeking to disentangle the unique predictive validity of various event-related worries.

We also note that the ordering of the questionnaire items on the survey may have influenced participants’ responses to the open-ended worry question. Prior to providing written responses to the question about their greatest COVID-19-related concerns, participants completed a series of closed-ended items asking how often in the past week they had experienced fear or worry pertaining to several specific aspects of the COVID-19 pandemic, such as ability to access basic necessities, economic fallout, and civil unrest. Research has demonstrated that the order in which items are presented can shape people’s responses (Strack et al., 1988) so it is possible that the specific COVID-19-related worries described in those questions may have been more salient and accessible and, thus, more likely to be reported when responding to the subsequent open-ended item about greatest COVID-19-related concerns (Gawronski & Bodenhausen, 2005). As a result, the ordering of the questionnaire items may



have inadvertently constrained the event-specific worries that were generated. Given that the COVID-19-related worries that were expressed in the sample did relate to posttraumatic mental health outcomes, we suspect that item-order effects did not unduly impact responding in the current study; nevertheless, future research should be mindful of potential item-order effects when designing surveys to examine naturalistic stressor framings of collective traumatic events.

It should also be acknowledged that participants' framings of the COVID-19 pandemic as a stressor were only assessed at one timepoint and that shifts in the prevalence in unique event framings over time reflected between-subjects, rather than within-subjects, changes. This design allowed us to draw conclusions about how people as a group were framing the COVID-19 pandemic as a stressor at various times; however, it precluded inferences about how a specific individual's event framings evolved from one time to the next. Given how rapidly the COVID-19 pandemic developed in its early days and theories suggesting that appraisals would change to reflect the evolving environment (Moors et al., 2013), there is reason to believe that individuals' framings of the event changed substantially during that same collection interval as well.

Furthermore, major COVID-19-related worries were identified by reviewing a random sample of responses drawn from participants across all three cohorts, rather than examining subsets of responses by cohort to generate cohort-specific codebooks. Thus, it is possible that this method of creating one codebook of event-specific worries across all cohorts may have obscured event framings that were unique to individual cohorts and the time periods they reflected. Given the similar prevalence rates of COVID-19-related worries across cohorts, it appears unlikely that this strategy posed major challenges to the aims or conclusions of this study; however, researchers seeking to understand unique framings at various timepoints may consider examining responses within, rather than across, data collection periods to characterize predominant event framings at

discrete timepoints. To address these issues, future research should utilize within-subjects designs to assess changes in collective traumatic event framing over time at the individual level and a cohort-specific analytic approach for between-subjects designs to examine population-level changes in framing across waves of data collection.

Another potential avenue for future research is to explore perceived future threats of scarcity in the context of collective traumatic event framing and adjustment. In this study, we found that worries about resource scarcity in the early days of the COVID-19 pandemic predicted prospective global psychological distress five to six months later. While we advise caution in interpreting this result given scarcity's nonsignificant relationships with event-specific distress and inconsistent relationships with general distress across different timepoints, we believe that fears of future scarcity warrant further empirical inquiry given the relevance of resource availability appraisals for coping with trauma. According to the stress appraisal model (Lazarus & Folkman, 1984), the extent to which people experience stress in a given situation is partially determined by their belief that they have the necessary resources to cope effectively with a perceived challenge or threat. Most stress appraisal research has focused on evaluations of current availability of resources in the form of coping strategies and social support (e.g., Folkman et al., 1986; Gunthert et al., 1999), but anticipating a potential future lack of material resources may similarly exacerbate stress responses, especially in the context of events like ongoing public health crises that require tangible resources for effective self-protection (Wirtz et al., 2007). Our finding that worrying about resource scarcity predicted subsequent general distress provides initial evidence for this conclusion that should be further explored in future research on framing of and emotional responses to collective traumatic events.

Finally, these results have important implications for government and public health officials during collective trauma. Official event-related communications can be tailored to address the aspects of the event that the public finds the most distressing; by providing information and guidance pertaining to these concerns, officials can attempt to fill the information vacuum that often contributes to uncertainty and distress in the trauma context (e.g., Lachlan et al., 2009). Gearing crisis-related messaging specifically toward those most central worries is likely to be a potent strategy for reducing ambiguity and anxiety, restoring perceptions of control, and protecting the mental health of the public in the wake of collective trauma (Heath & Gay, 1997). With directed messaging, crisis management officials can provide the public with the most pertinent information to better manage the stress of collective trauma.

## References

- Almeida, D. M. (2005). Resilience and vulnerability to daily stressors assessed via diary methods. *Current Directions in Psychological Science, 14*(2), 64–68.  
<https://doi.org/10.1111/j.0963-7214.2005.00336.x>
- Almeida, D. M., Wethington, E., & Kessler, R. C. (2002). The Daily Inventory of Stressful Events: An interview-based approach for measuring daily stressors. *Assessment, 9*(1), 41–55. <https://doi.org/10.1177/1073191102091006>
- Bolger, N., DeLongis, A., Kessler, R. C., & Schilling, E. A. (1989). Effects of daily stress on negative mood. *Journal of Personality and Social Psychology, 57*(5), 808–818.  
<https://doi.org/10.1037/0022-3514.57.5.808>
- Brosschot, J. F., Gerin, W., & Thayer, J. F. (2006). The perseverative cognition hypothesis: A review of worry, prolonged stress-related physiological activation, and health. *Journal of Psychosomatic Research, 60*(2), 113–124.  
<https://doi.org/10.1016/j.jpsychores.2005.06.074>
- Bryant, R. A. (2016). *Acute stress disorder: What it is and how you treat it*. Guilford.
- Cloitre, M., Garvert, D. W., Brewin, C. R., Bryant, R. A., & Maercker, A. (2013). Evidence for proposed ICD-11 PTSD and complex PTSD: A latent profile analysis. *European Journal of Psychotraumatology, 4*, 20706. <https://doi.org/10.3402/ejpt.v4i0.20706>
- Curtis, S. M., & Ghosh, S. K. (2011). A Bayesian approach to multicollinearity and the simultaneous selection and clustering of predictors in linear regression. *Journal of Statistical Theory and Practice, 5*(4), 715-735.  
<https://doi.org/10.1080/15598608.2011.10483741>
- David, J., Visvalingam, S., & Norberg, M. M. (2021). Why did all the toilet paper disappear?

- Distinguishing between panic buying and hoarding during COVID-19. *Psychiatry Research*, 303, 114062. <https://doi.org/10.1016/j.psychres.2021.114062>
- Derogatis, L. R. (2001). *BSI 18, Brief Symptom Inventory 18: Administration, scoring and procedures*. NCS Assessments.
- Deimling, G. T., Brown, S. P., Albitz, C., Burant, C. J., & Mallick, N. (2017). The relative importance of cancer-related and general health worries and distress among older adult, long-term cancer survivors. *Psycho-Oncology*, 26(2), 182-190. <https://doi.org/10.1002/pon.4015>
- Ellsworth, P. C. (2013). Appraisal theory: Old and new questions. *Emotion Review*, 5(2), 125–131. <https://doi.org/10.1177/1754073912463617>
- Folkman, S., Lazarus, R. S., Gruen, R. J., & DeLongis, A. (1986). Appraisal, coping, health status, and psychological symptoms. *Journal of Personality and Social Psychology*, 50(3), 571-579. <https://doi.org/10.1037/0022-3514.50.3.571>
- Garfin, D. R., Silver, R. C., Ugalde, F. J., Linn, H., & Inostroza, M. (2014). Exposure to rapid succession disasters: A study of residents at the epicenter of the Chilean Bío Bío earthquake. *Journal of Abnormal Psychology*, 123(3), 545–556. <https://doi.org/10.1037/a0037374>
- Gawronski, B., & Bodenhausen, G. V. (2005). Accessibility effects on implicit social cognition: The role of knowledge activation and retrieval experiences. *Journal of Personality and Social Psychology*, 89(5), 672-685. <https://doi.org/10.1037/0022-3514.89.5.672>
- Gunthert, K. C., Cohen, L. H., & Armeli, S. (1999). The role of neuroticism in daily stress and coping. *Journal of Personality and Social Psychology*, 77(5), 1087-1100. <https://doi.org/10.1037/0022-3514.77.5.1087>

- Heath, R. L., & Gay, C. D. (1997). Risk communication: Involvement, uncertainty, and control's effect on information scanning and monitoring by expert stakeholders. *Management Communication Quarterly*, *10*(3), 342-372.  
<https://doi.org/10.1177/0893318997010003004>
- Hirsch, C. R., & Mathews, A. (2012). A cognitive model of pathological worry. *Behaviour Research and Therapy*, *50*(10), 636–646. <https://doi.org/10.1016/j.brat.2012.06.007>
- Holeva, V., Tarrier, N., & Wells, A. (2001). Prevalence and predictors of Acute Stress Disorder and PTSD following road traffic accidents: Thought control strategies and social support. *Behavior Therapy*, *32*(1), 65–83. [https://doi.org/10.1016/S0005-7894\(01\)80044-7](https://doi.org/10.1016/S0005-7894(01)80044-7)
- Holman, E. A., Garfin, D. R., Lubens, P., & Silver, R. C. (2020). Media exposure to collective trauma, mental health, and functioning: Does it matter what you see? *Clinical Psychological Science*, *8*(1), 111–124. <https://doi.org/10.1177/2167702619858300>
- Holman, E. A., Thompson, R. R., Garfin, D. R., & Silver, R. C. (2020). The unfolding COVID-19 pandemic: A probability-based, nationally representative study of mental health in the United States. *Science Advances*, *6*(42), eabd5390.  
<https://doi.org/10.1126/sciadv.adb5390>
- Kessler, R. C., McLaughlin, K. A., Koenen, K. C., Petukhova, M., & Hill, E. D. (2012). The importance of secondary trauma exposure for post-disaster mental disorder. *Epidemiology and Psychiatric Sciences*, *21*(1), 35–45.  
<https://doi.org/10.1017/s2045796011000758>

- Lachlan, K. A., Spence, P. R., & Seeger, M. (2009). Terrorist attacks and uncertainty reduction: Media use after September 11. *Behavioral Sciences of Terrorism and Political Aggression, 1*(2), 101-110. <https://doi.org/10.1080/19434470902771683>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer Publishing Company.
- Liu, C. H., Zhang, E., Wong, G. T. F., Hyun, S., & Hahm, H. C. (2020). Factors associated with depression, anxiety, and PTSD symptomatology during the COVID-19 pandemic: Clinical implications for US young adult mental health. *Psychiatry Research, 290*, 113172. <https://doi.org/10.1016/j.psychres.2020.113172>
- Moors, A., Ellsworth, P. C., Scherer, K. R., & Frijda, N. H. (2013). Appraisal theories of emotion: State of the art and future development. *Emotion Review, 5*(2), 119–124. <https://doi.org/10.1177/1754073912468165>
- Neupert, S. D., Almeida, D. M., & Charles, S. T. (2007). Age differences in reactivity to daily stressors: The role of personal control. *The Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 62*(4), 216–225. <https://doi.org/10.1093/geronb/62.4.p216>
- Paul, K. I., & Moser, K. (2009). Unemployment impairs mental health: Meta-analyses. *Journal of Vocational Behavior, 74*(3), 264–282. <https://doi.org/10.1016/j.jvb.2009.01.001>
- Prins, A., Bovin, M. J., Kimerling, R., Kaloupek, D. G., Marx, B. P., Pless Kaiser, A., & Schnurr, P. P. (2015). Primary Care PTSD Screen for DSM-5 (PC-PTSD-5) [Measurement instrument].
- Post, M. W., & van Leeuwen, C. M. (2012). Psychosocial issues in spinal cord injury: A review. *Spinal Cord, 50*(5), 382–389. <https://doi.org/10.1038/sc.2011.182>

- Power, T. G., & Hill, L. G. (2010). Individual differences in appraisal of minor, potentially stressful events: A cluster analytic approach. *Cognition & Emotion, 24*(7), 1081-1094.  
<https://doi.org/10.1080/02699930903122463>
- Simon, R. I. (1999). Chronic posttraumatic stress disorder: A review and checklist of factors influencing prognosis. *Harvard Review of Psychiatry, 6*(6), 304-312.  
<https://doi.org/10.3109/10673229909017208>
- Strack, F., Martin, L. L., & Schwarz, N. (1988). Priming and communication: The social determinants of information use in judgments of life satisfaction. *European Journal of Social Psychology, 18*(5), 429-442. <https://doi.org/10.1002/ejsp.2420180505>
- Strauss, A., & Corbin, J. M. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Sage Publications, Inc.
- Stroebe, M., Schut, H., & Stroebe, W. (2007). Health outcomes of bereavement. *Lancet, 370*(9603), 1960–1973. [https://doi.org/10.1016/S0140-6736\(07\)61816-9](https://doi.org/10.1016/S0140-6736(07)61816-9)
- Sturgeon, J. A., Arewasikporn, A., Okun, M. A., Davis, M. C., Ong, A. D., & Zautra, A. J. (2016). The psychosocial context of financial stress: Implications for inflammation and psychological health. *Psychosomatic Medicine, 78*(2), 134–143.  
<https://doi.org/10.1097/PSY.0000000000000276>
- Sunderland, M., Newby, J. M., & Andrews, G. (2013). Health anxiety in Australia: Prevalence, comorbidity, disability and service use. *The British Journal of Psychiatry, 202*(1), 56-61.  
<https://doi.org/10.1192/bjp.bp.111.103960>
- Tallis, F., & Eysenck, M. W. (1994). Worry: Mechanisms and modulating influences. *Behavioural and Cognitive Psychotherapy, 22*(1), 37–56.  
<https://doi.org/10.1017/S1352465800011796>



Thompson, R. R., Jones, N. M., Holman, E. A., & Silver, R. C. (2019). Media exposure to mass violence events can fuel a cycle of distress. *Science Advances*, 5(4), eaav3502.

<https://doi.org/10.1126/sciadv.aav3502>

Watkins, E. R. (2008). Constructive and unconstructive repetitive thought. *Psychological Bulletin*, 134(2), 163-206. <https://doi.org/10.1037/0033-2909.134.2.163>

Wirtz, P. H., von Kanel, R., Emini, L., Suter, T., Fontana, A., & Ehlert, U. (2007). Variations in anticipatory cognitive stress appraisal and differential proinflammatory cytokine expression in response to acute stress. *Brain, Behavior, and Immunity*, 21(6), 851-859.

<https://doi.org/10.1016/j.bbi.2007.02.003>

Zabora, J., Brintzenhofesoc, K., Curbow, B., Hooker, C., & Piantadosi, S. (2001). The prevalence of psychological distress by cancer site. *Psycho-Oncology*, 10(1), 19-28.

[https://doi.org/10.1002/1099-1611\(200101/02\)10:1<19::aid-pon501>3.0.co;2-6](https://doi.org/10.1002/1099-1611(200101/02)10:1<19::aid-pon501>3.0.co;2-6)

## Appendix A

Post-Hoc Tetrachoric Correlations for COVID-19-Related Worries ( $N = 1,000$ )

	1	2	3	4	5	6	7
1. Health	–						
2. Interpersonal	.72***	–					
3. Economics	-.33***	-.14*	–				
4. Scarcity	.04	-.12*	.09	–			
5. Disarray	-.45***	-.39***	-.14	.12	–		
6. Government/media	-.38***	-.37***	-.06	-.09	.10	–	
7. Uncertainty	-.23***	.28***	.11	-.02	-.22**	-.14	–

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

## **CHAPTER 5:**

### **Epilogue**

## Epilogue

For decades, social psychological research has demonstrated the importance of construal in shaping people's thoughts, feelings, and behaviors (Ross et al., 2010). The centrality of subjective meaning is evidenced in seminal works spanning the field, from attitude formation (Bem, 1972) to attribution and attraction (Dutton & Aron, 1974), but most prominently in appraisal theories of emotion, which argue that personally relevant evaluations of situations are inextricable components in the emotion process (Frijda, 1993; Moors et al., 2013). Although the relationship between subjective perceptions and emotional responses is well documented in the social psychological literature, research on collective trauma has largely overlooked the role of event construal in posttraumatic mental health responding in favor of objective characteristics of the event itself and individuals experiencing them. This dissertation contributes to the collective trauma literature by adopting a social psychological framework and diverse text analytic methods to explicate how people subjectively frame collective traumatic events and how collective traumatic event framings relate to psychological adjustment following collective trauma.

Chapter 2 explored the link between partisan framings of and acute stress responses to a U.S. political event – the 2018 Judge Brett Kavanaugh-Dr. Christine Blasey Ford Senate Judiciary hearings. Using unsupervised topic modeling to analyze responses from a national sample days after the hearings, results showed that partisans endorsed divergent, identity-consistent framings of the same event and that Republican and individuals who endorsed Republican framings of the event reported lower hearing-related acute stress. This study demonstrated the value of a novel text analytic approach for identifying naturalistic event framings and provided initial, cross-sectional support for the framing-emotion link in the context of a collective stressful event.

Building on the results from Chapter 2, Chapter 3 assessed the longitudinal relationship between event framings and psychological responses around the anniversaries of a mass violence event, the 2013 Boston Marathon bombings (BMB). Using traditional grounded theory techniques to analyze responses from a subsample of American adults at the one-year anniversary, nine unique framings of the Boston Marathon bombings were identified, of which two framings predicted general and event-specific mental health responses one year later. Individuals who focused on the marathon continuing reported lower event-related posttraumatic stress, whereas individuals who framed the marathon in terms of the perceived failings of legal authorities experienced greater BMB-related posttraumatic stress and heightened worry about future violence and terrorism. This study documented evidence for the longitudinal link between event framing and posttraumatic mental health responses, demonstrating the relevance of event framings at meaningful milestones beyond the acute period and utility of another text analytic approach for identifying framings.

Chapter 4 bridged Chapters 2 and 3 by testing the framing-emotion relationship both cross-sectionally and longitudinally in the context of a chronic, ongoing public health crisis: the COVID-19 pandemic. Following a national sample of U.S. adults from the early days of the pandemic over time, analyses revealed that the COVID-19 pandemic was framed as multiple distinct stressors, with worries ranging from the physical and mental health toll for oneself and others to resource scarcity, economic upheaval, and societal chaos. Framing the event as a health stressor was associated with greater general and event-specific distress in the short-term, while economic and scarcity framings were related to heightened concurrent and subsequent general distress, respectively. Findings from this study replicated patterns from Chapters 2 and 3 in a

different context using a novel stressor framing approach to identify the diversity of threats perceived pertaining to an all-encompassing collective traumatic event.

Findings across three studies and three distinct collective stressful and traumatic events demonstrated cross-sectional and longitudinal evidence that unique framings of the event were associated with general and event-related emotional responding. These studies add to a growing body of research documenting the importance of considering subjective event perceptions in adjustment to major life events (De Vries et al., 2021; Haehner et al., 2021) and support the notion that the subjective meaning that people ascribe to events meaningfully shapes their emotional responses to them, consistent with both appraisal theories of emotion (Moors et al., 2013; Roseman et al., 1996) and the stress appraisal model (Lazarus & Folkman, 1984). Beyond providing consistent evidence, this work also extends these theoretical perspectives by using a broader subjectivist approach to explore framings of collective traumatic events. Appraisal theorists have argued that current assessments of appraisals, which are largely comprised of closed-ended items, capture an incomplete representation of naturalistic event perceptions and that using mixed-methods designs to analyze language may be a fruitful avenue for more fully explicating emotional processes (Ellsworth, 2013). By using traditional and automated text analytic tools to examine broad framings of impactful large-scale events, this mixed-methods work has contributed to emerging empirical efforts to map more comprehensive appraisals onto emotional responses.

Furthermore, this text-based approach to studying event framings is particularly generative and offers a promising method for advancing research on collective trauma by identifying underexplored topics of inquiry. By collecting open-ended data and using bottom-up analytic techniques, researchers can capture richer, more nuanced perceptions of collective

traumas that may uncover novel, previously undiscovered topics for future study. For example, in Chapter 4, worry about material resource scarcity was the one event framing in the early days of the COVID-19 pandemic that predicted distress six months later. While more work is needed to replicate and assess the validity of this finding, it suggests that concerns about tangible resource security may be associated with longer-term distress in the aftermath of collective trauma. Given related research showing that scarcity can shift attention in ways that promote counterproductive behaviors (e.g., Shah et al., 2012), it may be important to investigate whether scarcity worries may relate to more maladaptive coping with collective trauma. This example illustrates how using data-driven, mixed-methods approaches to study collective traumatic event framings can offer more opportunities to identify novel avenues for future research.

### **Limitations and Future Directions**

Although this dissertation provides rich information about American adults' framings of various collective traumatic events, these studies only collected data on event perceptions at a single timepoint for each participant. This method allowed for the characterization of group- or population-level event framing, but it did not enable fine-grained analysis of intraindividual changes in event framing over time. Appraisal and emotion processes are theorized to be dynamic and to evolve to mirror changes in the environment (Moors et al., 2013) so shifts in event framings may indicate changes in coping and posttraumatic adjustment. Using within-subjects designs would provide opportunities to track individual-level changes in both event framings and posttraumatic emotional responses and test a host of theoretical questions as a result. For example, within-subjects research could examine whether shifts in event framing precede changes in emotions, whether emotion shifts precede framing changes, or whether these changes occur in tandem. Furthermore, research could explore the timing of framing change to

test whether evolution in event perceptions occurs shortly after the event or gradually over time and whether the timing of framing change differs depending on the duration of the collective traumatic event (acute/discrete versus chronic). Some evidence has found that event perceptions are more stable than previously thought, suggesting that within-subjects research on event framing is unlikely to reveal much variation (Haehner et al., 2021). However, that work was conducted using past discrete, not chronic ongoing, events, leaving the issue of the stability or changeability of event perceptions for different types of events as an open question. Nevertheless, future research on event framing should utilize within-subjects designs to address these and other theoretical questions.

Another limitation of this work is that the characteristics of participants who choose to provide responses to open-ended questions tend to differ from those of the entire representative national sample. As evidenced in Chapters 2, 3, and 4, respondents who share written responses in these studies were typically older, disproportionately White, and more educated than the full sample. This pattern of results is consistent with those found in prior work on predictors of expressing written reactions in the aftermath of collective trauma (Adler & Poulin, 2009; Seery et al., 2008), suggesting that the lack of representativeness of the samples for this work may be a persistent methodological issue. Limited age, racial/ethnic, and socioeconomic diversity in this research not only threatens to undermine the validity and generalizability of its conclusions; given that people who are younger, belong to ethnic minority groups, and are from lower socioeconomic backgrounds tend to experience worse psychological outcomes following collective trauma (e.g., Brewin et al., 2000; Diaz et al., 2021; Perilla et al., 2002), their limited inclusion may also reinforce posttraumatic mental health disparities by failing to capture information about their experiences that could support intervention efforts to promote better



psychological outcomes among these vulnerable populations. To address this limitation and produce generalizable and equitable research, it is vital that future work on event framing designs studies to specifically target samples that are diverse in age, race/ethnicity, socioeconomic status, and other relevant demographics.

Lastly, an exciting future direction for this work is to explore the predictors of event framings and factors that may play a role in shaping them. This dissertation demonstrated evidence for the link between event framing and emotional responses in the context of collective trauma in three studies; now that it has been established that event framing does have meaningful implications for mental health, an important next step in this work is to deepen our understanding of various sociodemographic characteristics, lived experiences, and/or beliefs that can relate to or influence the way people perceive these consequential events. Appraisal theories have long contended that individual differences can explain different evaluations of and emotional reactions to the same situation (Moors et al., 2013) and, indeed, the findings in Chapter 2 suggest that political identities and perhaps social identities more broadly may be one such individual difference. The news media is another factor that has been discussed in this dissertation that could shape event framings. Political science and communications scholars argue that media organizations shape how their viewers frame the events they cover (e.g., Iyengar & Kinder, 1987) but limited experimental work has documented this effect and, to our knowledge, no research has yet to link the influence of the news media on individuals' event framing to psychological adjustment following collective trauma. Social identity and the news media represent two of the many possible factors that play an important role in shaping framings of collective traumatic events to be explored in future research.

The overarching goal of this dissertation was to expand what is known about coping with stress and trauma by examining the understudied role of subjective event perceptions in posttraumatic mental health outcomes. By leveraging social psychological perspectives, this work underscored how clinically relevant psychological outcomes in the wake of collective trauma can be better understood by considering the subjective meaning that those impacted ascribed to the events. The effect sizes of these findings were relatively small but, given the scale of these events, even modest predictors of psychological responding can have significant implications for global mental health (Funder & Ozer, 2019). As local, national, and international communities continue to be adversely impacted by natural and manmade disasters, research must continue to investigate psychological processes that can influence coping and well-being to better protect the mental health of our communities.

## References

- Adler, J. M., & Poulin, M. J. (2009). The political is personal: Narrating 9/11 and psychological well-being. *Journal of Personality*, 77(4), 903-932. <https://doi.org/10.1111/j.1467-6494.2009.00569.x>
- Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 6, pp. 1-62). New York: Academic Press. [https://doi.org/10.1016/S0065-2601\(08\)60024-6](https://doi.org/10.1016/S0065-2601(08)60024-6)
- Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology*, 68(5), 748-766. <https://doi.org/10.1037/0022-006X.68.5.748>
- De Vries, J. H., Spengler, M., Frintrup, A., & Mussel, P. (2021). Personality development in emerging adulthood—How the perception of life events and mindset affect personality trait change. *Frontiers in Psychology*, 12, 671421. <https://doi.org/10.3389/fpsyg.2021.671421>
- Diaz, A., Baweja, R., Bonatakis, J. K., & Baweja, R. (2021). Global health disparities in vulnerable populations of psychiatric patients during the COVID-19 pandemic. *World Journal of Psychiatry*, 11(4), 94-108. <https://doi.org/10.5498/wjp.v11.i4.94>
- Dutton, D. G., & Aron, A. P. (1974). Some evidence for heightened sexual attraction under conditions of high anxiety. *Journal of Personality and Social Psychology*, 30(4), 510-517. <https://doi.org/10.1037/h0037031>
- Ellsworth, P. C. (2013). Appraisal theory: Old and new questions. *Emotion Review*, 5(2), 125-131. <https://doi.org/10.1177/1754073912463617>

- Frijda, N. H. (1993). The place of appraisal in emotion. *Cognition and Emotion*, 7, 357-387.  
<https://doi.org/10.1080/02699939308409193>
- Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. *Advances in Methods and Practices in Psychological Science*, 2(2), 156-168.  
<https://doi.org/10.1177/2515245919847202>
- Haehner, P., Kritzler, S., Fassbender, I., & Luhmann, M. (2021). Stability and change of perceived characteristics of major life events. *Journal of Personality and Social Psychology*. Advance online publication. <https://doi.org/10.1037/pspp0000394>
- Iyengar, S., & Kinder, D. R. (1987). *American politics and political economy. News that matters: Television and American opinion*. University of Chicago Press.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer Publishing Company.
- Moors, A., Ellsworth, P. C., Scherer, K. R., & Frijda, N. H. (2013). Appraisal theories of emotion: State of the art and future development. *Emotion Review*, 5(2), 119–124.  
<https://doi.org/10.1177/1754073912468165>
- Perilla, J. L., Norris, F. H., & Lavizzo, E. A. (2002). Ethnicity, culture, and disaster response: Identifying and explaining ethnic differences in PTSD six months after Hurricane Andrew. *Journal of Social and Clinical Psychology*, 21(1), 20-45.  
<https://doi.org/10.1521/jscp.21.1.20.22404>
- Roseman, I. J., Antoniou, A. A., & Jose, P. E. (1996). Appraisal determinants of emotions: Constructing a more accurate and comprehensive theory. *Cognition and Emotion*, 10(3), 241-277. <https://doi.org/10.1080/026999396380240>

- Ross, L., Lepper, M., & Ward, A. (2010). History of social psychology: Insights, challenges, and contributions to theory and application. In S. T. Fiske, D. T. Gilbert, & G. Lindzey (Eds.), *Handbook of social psychology* (pp. 3–50). John Wiley & Sons Inc.
- Seery, M. D., Silver, R. C., Holman, E. A., Ence, W. A., & Chu, T. Q. (2008). Expressing thoughts and feelings following a collective trauma: Immediate responses to 9/11 predict negative outcomes in a national sample. *Journal of Consulting and Clinical Psychology*, 76(4), 657-667. <https://doi.org/10.1037/0022-006X.76.4.657>
- Shah, A. K., Mullainathan, S., & Shafir, E. (2012). Some consequences of having too little. *Science*, 338(6107), 682-685. <https://doi.org/10.1126/science.1222426>