

Technological Mediation of Strategies in Coping with Mental Health Challenges: A Case Study with People with Bipolar Disorder

TIAN XU, Department of Information Science University of Colorado Boulder, USA

STEPHEN VOIDA, Department of Information Science University of Colorado Boulder, USA

CCS Concepts: • **Human-centered computing** → **Human computer interaction (HCI)**.

Additional Key Words and Phrases: mental health informatics, bipolar disorder, technology use, online community

ACM Reference Format:

Tian Xu and Stephen Volda. 2022. Technological Mediation of Strategies in Coping with Mental Health Challenges: A Case Study with People with Bipolar Disorder. In *CHI 2022 Workshop on Challenges, Tensions, and Opportunities in Designing Ecosystems to Support the Management of Complex Health Needs, April 30, 2022, New Orleans, LA, USA*. ACM, New York, NY, USA, 3 pages.

Technology plays a critical and complex role in people’s daily lives and, undoubtedly, in the day-to-day lives of people with mental health challenges. In academia, the technology use of people with mental health challenges has been studied for years (e.g., [7, 8, 10]). Examining the technology use of these individuals can better inform the design and development of technologies to support mental wellness and potentially enable early detection and prediction of significant episodes (e.g., [5, 8]). Technology can play an important role in mental wellness since it potentially makes the treatment of mental illness more accessible, increases patient engagement, and results in more effective and affordable outcomes [6]. However, technology may also trigger or be detrimental to individuals’ mental health conditions. Previous studies conveyed different—even disparate—technology use in the context of mental health treatment. Therefore, we lack comprehensive or nuanced understandings of 1) to what extent people with mental illnesses use various technologies as part of their self-treatment, 2) what the characteristics of these technologies are in terms of the roles that they play in everyday mental health management; and 3) how technology use changes over time for individuals managing chronic mental illnesses.

Bipolar disorder (BD), also called manic depression, is considered a serious mental illness (SMI). Globally, BD impacts approximately 46 million people [15]. In the U.S., roughly 7 million adults have been diagnosed with BD [11]. According to the National Institute of Mental Health, in bipolar disorder, an individual’s mood, energy, and activity levels shift dramatically [13]. People with bipolar disorder experience “high self-esteem, irritability and sleeplessness, and devastating depressions” [9]. BD often appears during adolescence (aged 10–18 years), during a critical developmental stage [14] as well as in young adults (aged 18–25 years). It is reported that the number of children, adolescents, and young adults diagnosed with BD has significantly increased over the last three decades (roughly 40 times from 1994 to 2003), and the number is rising [3, 4]. Finally, people with BD live with the condition indefinitely, since the mental illness cannot be cured [10].

When managing serious mental illnesses like bipolar disorder, people’s dependencies on technologies are complex and highly context-dependent. For example, social media can be both beneficial and detrimental to mental health

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the owner/author(s).

© 2022 Copyright held by the owner/author(s).

Manuscript submitted to ACM

conditions—that is, a “double-edged sword” [8]. In this case, individuals managing mental illness are often interested in finding social support from a community of peers on social media [12]. However, outside of the community, disclosing information about one’s mental illness on social media can result in feelings of stigma, shame, and isolation [8]. Prior studies revealed a high overall level of acceptance for using personal health informatics technologies specifically for condition management. Beard et al. found, for example, that 71% of their participants with serious mental illnesses ($N = 322$) were willing to use mental health apps to do mindfulness/meditation [2]. Other studies found similar levels of support for technologies with a stronger focus on mood and trigger tracking [1, 9].

1 CURRENT RESEARCH

These findings led us to our primary research question: **how can designers construct a holistic and nuanced understanding of the technology use of people with serious mental illnesses?** Without this kind of holistic and nuanced understanding, we may lose valuable information about people’s complex needs and lived experiences—information that can inform novel technology or system design to support condition management. Therefore, our current study aims to fill the research gap through the lens of bipolar disorder communities on Reddit.

We have collected four years of data from BD-related subreddits to investigate 1) what technologies are being used to manage bipolar disorder, 2) in what capacity these technologies are currently used, and 3) how these technology usage patterns are changing over time. Although our topical and semantic analysis of these corpora is ongoing, we have begun to build evidence that various technologies are being appropriated to serve as *community*, *episode*, and *information mediators*, impacting individuals’ everyday bipolar disorder management.

In this workshop, we are excited to discuss:

- how to design contextual awareness technologies to support people to capture in situ internal and external changes to manage mental health, and
- methods for leveraging online communities to understand the technology use of people with chronic mental health illnesses on a large scale.

2 AUTHORS’ BACKGROUND

Tian Xu is a Ph.D. student in the Department of Information Science at the University of Colorado Boulder, advised by Dr. Stephen Volda. Her research interests primarily lie in HCI and CSCW with a focus on mental health informatics. **Stephen Volda** is an Assistant Professor and founding faculty of the Department of Information Science at the University of Colorado Boulder. He directs the Too Much Information (TMI) research laboratory, where he and his multidisciplinary team of students conduct empirical, design, and systems research in personal informatics supporting physical, mental, and professional wellness.

REFERENCES

- [1] Jakob E. Bardram, Mads Frost, Károly Szántó, Maria Faurholt-Jepsen, Maj Vinberg, and Lars Vedel Kessing. 2013. Designing mobile health technology for bipolar disorder: a field trial of the monarca system. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM Press, New York, NY, 2627–2636. <https://doi.org/10.1145/2470654.2481364>
- [2] C. Beard, Alexandra Silverman, Marie Forgeard, M Taylor Wilmer, John Torous, and Thröstur Björgvinsson. 2019. Smartphone, Social Media, and Mental Health App Use in an Acute Transdiagnostic Psychiatric Sample. *JMIR mHealth and uHealth* 7, 6 (2019), e13364.
- [3] Jane E. Brody. 2021. The challenges of bipolar disorder in young people. Retrieved March 2, 2022 from <https://www.nytimes.com/2021/07/05/well/mind/bipolar-disorder-young-people.html>.
- [4] Benedict Carey. 2021. Bipolar illness soars as a diagnosis for the young. Retrieved March 2, 2022 from <https://www.nytimes.com/2021/07/05/well/mind/bipolar-disorder-young-people.html>.

- [5] Munmun De Choudhury, Michael Gamon, Scott Counts, and Eric Horvitz. 2013. Predicting Depression via Social Media. *Proceedings of the Seventh International AAAI Conference on Weblogs and Social Media* 7, 1 (2013), 128–137. <https://ojs.aaai.org/index.php/ICWSM/article/view/14432>
- [6] Gavin Doherty, John Sharry, Magnus Bang, Mariano Alcañiz, and Rosa Baños. 2008. Technology in mental health. In *Extended Abstracts on Human Factors in Computing Systems*. ACM Press, New York, NY, 3965–3968.
- [7] Reeva Lederman, John Gleeson, Greg Wadley, Simon D'alfonso, Simon Rice, Olga Santesteban-Echarri, and Mario Alvarez-Jimenez. 2019. Support for Carers of Young People with Mental Illness: Design and Trial of a Technology-Mediated Therapy. *TOCHI* 26, 1 (2019), 4:1–4:33. <https://doi.org/10.1145/3301421>
- [8] Mark Matthews, Elizabeth L. Murnane, Jaime Snyder, Shion Guha, Pamara Chang, Gavin Doherty, and Geri Gay. 2017. The double-edged sword: A mixed methods study of the interplay between bipolar disorder and technology use. *Computers in Human Behavior* 75 (2017), 288–300. <https://doi.org/10.1016/j.chb.2017.05.009>
- [9] Mark Matthews, Stephen Volda, Saeed Abdullah, Gavin Doherty, Tanzeem Choudhury, Sangha Im, and Geri Gay. 2015. In Situ Design for Mental Illness: Considering the Pathology of Bipolar Disorder in mHealth Design. In *Proceedings of the 17th International Conference on Human-Computer Interaction with Mobile Devices and Services*. ACM Press, New York, NY, 86–97. <https://doi.org/10.1145/2785830.2785866>
- [10] Elizabeth L. Murnane, Tara G. Walker, Beck Tench, Stephen Volda, and Jaime Snyder. 2018. Personal Informatics in Interpersonal Contexts: Towards the Design of Technology that Supports the Social Ecologies of Long-Term Mental Health Management. *Proceedings of the ACM on Human-Computer Interaction* 2, CSCW (2018), 1–27. <https://doi.org/10.1145/3274396>
- [11] NAMI. 2022. Mental health by the numbers. Retrieved March 2, 2022 from <https://www.nami.org/mhstats>.
- [12] J.A. Naslund, K.A. Aschbrenner, L.A. Marsh, and S.J. Bartels. 2016. The future of mental health care: peer-to-peer support and social media. *Epidemiology and Psychiatric Sciences* 25, 2 (2016), 113–122. <https://doi.org/10.1017/S2045796015001067>
- [13] National Institute of Mental Health. 2022. Bipolar Disorder. Retrieved March 2, 2022 from <https://www.nimh.nih.gov/health/statistics/bipolar-disorder>.
- [14] National Institute of Mental Health. 2022. Bipolar Disorder. Retrieved March 2, 2022 from <https://www.nimh.nih.gov/health/topics/bipolar-disorder>.
- [15] Saloni Dattani, Hannah Ritchie, and Max Roser. 2021. Mental Health. Retrieved March 2, 2022 from <https://ourworldindata.org/mental-health>.