DAMIEN LEKKAS

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BIOGRAPHICAL INFORMATION

Date of Birth:	July 30, 1990	Nationality:	American
Place of Birth:	Woodbury, NJ, USA	Ethnicity:	White/non-Hispanic
Gender:	Male	Pronouns:	he/him/his

EDUCATION

DARTMOUTH COLLEGE — Hanover, NH
Ph.D., Quantitative Biomedical Sciences — Aug 2019 – Dec 2024

UNIVERSITY OF THE SCIENCES — Philadelphia, PA
M.S., Bioinformatics — Aug 2017 – May 2019

UNIVERSITY OF PENNSYLVANIA — Philadelphia, PA
M.S., Anthropology — Jan 2010 – May 2014
B.A., Anthropology and Biology (*Magna cum laude*) — Sept 2008 – May 2014

SCIENTIFIC INTERESTS AND CAREER FOCI

mental health; human behavior; applied machine learning; natural language processing; large language models; network analysis; statistical modeling; mobile sensing; passive sensing; ecological momentary assessment; digital phenotypes

RESEARCH APPOINTMENTS

Pre-Doctoral Researcher in Data Science & Psychiatry — Lebanon, NH
Center for Technology and Behavioral Health, Geisel School of Medicine, Dartmouth College — Mar 2020 – Dec 2024

Laboratory Research Specialist in Translational Medicine — Philadelphia, PA
ITMAT, Perelman School of Medicine, University of Pennsylvania — Dec 2016 – Jun 2019

Laboratory Research Specialist in Evolution and Ecology — Philadelphia, PA
Department of Biology, College of Arts & Sciences, University of Pennsylvania — May 2014 – Jun 2016

PEER-REVIEWED SCIENTIFIC PUBLICATIONS

h-index: 14   i10-index: 15   *Denotes undergraduate mentee   †Denotes co-first authorship

32. Gallagher, M., Collins, A.C., **Lekkas, D.**, Nemesure, M.D., Griffin, T.Z., Price, G.D., Heinz, M.V., Pillai A., Nepal, S., Mackin, D.M., Campbell. A.T., Winer, E.S., and Jacobson, N.C. (2024). Anhedonia in flux: Understanding the associations of emotion regulation and anxiety with anhedonia dynamics in a sample with major depressive disorder. *Journal of Affective Disorders.*

31. Heinz, M.V., **Lekkas, D.**, Abreu, V., Lee, C., Marsch, L., and Jacobson, N.C. (2024). Evaluating a mobile app's effects on depression and anxiety in medication-treated opioid use disorder. *npj Mental Health Research,* 3. Article 43. https://doi.org/10.1038/s44184-024-00086-7

30. **Lekkas, D.** and Jacobson, N.C. (2024). Breaking the silence: Leveraging social interaction data to identify high-risk suicide users online using network analysis and machine learning. *Scientific Reports*, 14. Article 19395. https://doi.org/10.1038/s41598-024-70282-0

29. Collins, A.C., **Lekkas, D.**, Struble, C.A., Trudeau, B.M., Jewett, A.D., Griffin, T.Z., Nemesure, M.D., Price, G.D., Heinz, M.V., Nepal, S., Pillai, A., Mackin, D.M., Campbell, A.T., Budney, A.J., & Jacobson, N.C. (2024). From mood to use: Using ecological momentary assessments to examine how anhedonia and depressed mood impact cannabis use in a depressed sample. *Psychiatry Research*, 339. https://doi.org/10.1016/j.psychres.2024.116110

28. Gyorda, J.A.*, **Lekkas, D.**, and Jacobson, N.C. (2024). Screening for anxiety: Detecting longitudinal trends between passively-collected phone use and anxiety. *Digital Biomarkers*, 8(1): 181-193. https://doi.org/10.1159/000540546

27. Kline, E., **Lekkas, D.**, Bryan, A., Nemesure, M.D., Griffin, T.Z., Collins A., Price, G.D., Heinz, M.V., Nepal, S., Pillai, A., Campbell, A., and Jacobson, N.C. (2024). The role of borderline personality disorder traits in predicting longitudinal variability of major depressive symptoms among a sample of depressed adults. *Journal of Affective Disorders*, 363: 492-500. https://doi.org/10.1016/j.jad.2024.07.104

26. Klein, R.J., **Lekkas, D.**, Nguyen, N.D., and Jacobson, N.C. (2024). Comparing transdiagnostic risk factors: Predicting emergence of significant depressive, anxiety, and substance abuse symptoms among juvenile delinquents. *Child Psychiatry and Human Development.* https://doi.org/10.1007/s10578-024-01682-6

25. Nepal, S., Pillai, A., Wang, W., Griffin, T., Collins, A.C., Heinz, M., **Lekkas, D.**, Mirjafari, S., Nemesure, M., Price, G., Jacobson, N., and Campbell, A. (2024). MoodCapture: Depression detection using in-the-wild smartphone images. *Proceedings of the CHI Conference on Human Factors in Computing Systems*. Article 996. https://doi.org/10.1145/3613904.3642680

24. **Lekkas, D.**, Yom-Tov, E., Heinz, M.V., Gyorda, J.A.*, Nguyen, T., Barr, P.J., and Jacobson, N.C. (2024). The trajectories of online mental health information seeking: Modeling search behavior before and after completion of validated self-report screens. *Computers in Human Behavior*, 157. https://doi.org/10.1016/j.chb.2024.108267

23. Pillai, A., Nepal, S.K., Wang, W., Nemesure, M., Heinz, M., Price, G., **Lekkas, D.**, Collins, A.C., Griffin, T., Buck, B., Preum, S.M., Cohen, T., Jacobson, N.C., Ben-Zeev, D., and Campbell, A. (2024). Investigating generalizability of speech-based suicidal ideation detection using mobile phones. *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 7, 4, Article 174. https://doi.org/10.1145/3631452

22. Nemesure, M.D., Collins, A.C., Price, G.D., Griffin, T.Z., Pillai, A., Nepal, S., Heinz, M.V., **Lekkas, D.**, Campbell, A.T., and Jacobson, N.C. (2024). Depressive symptoms as a heterogeneous and constantly evolving dynamical system: Idiographic depressive symptom networks of rapid symptom changes among persons with major depressive disorder. *Journal of Psychopathology and Clinical Science*, 133(2). https://doi.org/10.1037/abn0000884

21. **Lekkas, D.** and Jacobson, N.C. (2023). The hidden depths of suicidal discourse: Network analysis and natural language processing unmask uncensored expression. *Digital Health*, 9. https://doi.org/10.1177/20552076231210714

20. **Lekkas, D.**, Gyorda, J.A.*, Price, G.D., and Jacobson, N.C. (2023). Depression deconstructed: Wearables and passive digital phenotyping for analyzing individual symptoms. *Behaviour Research and Therapy*, 168. https://doi.org/10.1016/j.brat.2023.104382

19. Klein, R.J., Gyorda, J.A., **Lekkas, D.**, and Jacobson, N.C. (2023). Dysregulated emotion and trying substances in childhood: Insights from a large nationally representative cohort study. *Substance Use and Misuse*, 58(13). https://doi.org/10.1080/10826084.2023.2223290

18. Gyorda, J.A.*, **Lekkas, D.**, Price, G.D., and Jacobson, N.C. (2022). Evaluating the impact of mask mandates and political party affiliation on mental health online search behavior in the United States during the COVID-19 pandemic: A generalized additive mixed model framework. *Journal of Medical Internet Research*, 25. https://doi.org/10.2196/40308

17. Yom-Tov, E., **Lekkas, D.**, Heinz, M.V., Nguyen, T., Barr, P.J., and Jacobson, N.C. (2022). Digitally filling the access gap in mental healthcare: An investigation of the association between rurality and online engagement with validated self-report screens across the United States. *Journal of Psychiatric Research*, 157. https://doi.org/10.1016/j.jpsychires.2022.11.024

16. **Lekkas, D.**, Gyorda, J.A.*, Moen, E.L., and Jacobson, N.C. (2022). Using passive sensor data to probe associations of social structure with changes in personality: A synthesis of network analysis and machine learning. *PLOS ONE*, 17(11): e0277516. https://doi.org/10.1371/journal.pone.0277516

15. **Lekkas, D.**, Gyorda, J.A.*, and Jacobson, N.C. (2022). A machine learning investigation into the temporal dynamics of physical activity-mediated emotional regulation in adolescents with anorexia nervosa and healthy controls. *European Eating Disorders Review*, 31(1). https://doi.org/10.1002/erv.2949

14. Nemesure, M., Streltzov, N., Schommer, L., **Lekkas, D.**, Jacobson, N.C., and Bujarski, K. (2022). Predictive modeling of suicidal ideation in patients with epilepsy. *Epilepsia*, 63(9). https://doi.org/10.1111/epi.17324

13. **Lekkas, D.**, Gyorda, J.A.*, Price, G.D., Wortzman, Z.*, and Jacobson, NC. (2022). Using the COVID-19 pandemic to assess the influence of news affect on online mental health-related search behavior across the United States: Integrated sentiment analysis and the circumplex model of affect. *Journal of Medical Internet Research*, 24(1). https://doi.org/10.2196/32731

12. **Lekkas, D.**, Price, G., and Jacobson NC. (2022). Using smartphone app use and lagged-ensemble machine learning for the prediction of work fatigue and boredom. *Computers in Human* Behavior, 127. https://doi.org/10.1016/j.chb.2021.107029

11. **Lekkas, D.**, Price, G., McFadden J.*, and Jacobson, NC. (2021). The application of machine learning to online mindfulness intervention data: A primer and empirical example in compliance assessment. *Mindfulness*, 12. https://doi.org/10.1007/s12671-021-01723-4

10. **Lekkas, D.**, Klein, RJ., and Jacobson NC. (2021). Predicting acute suicidal ideation on Instagram using ensemble machine learning models. *Internet Interventions*, 25. https://doi.org/10.1016/j.invent.2021.100424

9. Yom-Tov, E., **Lekkas, D.**, and Jacobson, N.C. (2021). Association of COVID19-induced anosmia and ageusia with depression and suicidal ideation. *Journal of Affective Disorders Reports*, 5. https://doi.org/10.1016/j.jadr.2021.100156

8. **Lekkas, D.** and Jacobson, N.C. (2021). Using artificial intelligence and longitudinal location data to differentiate persons who develop posttraumatic stress disorder following childhood trauma. *Scientific Reports*, 11. Article 10303. https://doi.org/10.1038/s41598-021-89768-2

7. Jacobson, N.C., **Lekkas, D.**, Huang, R., and Thomas, N. (2020). Deep learning paired with wearable passive sensing data predict deterioration in anxiety disorder symptoms across 17-18 years. *Journal of Affective Disorders*, 282. https://doi.org/10.1016/j.jad.2020.12.086

6. Jacobson, N.C., Yom-Tov, E., **Lekkas, D.**, Heinz, M.V., Liu, L., and Barr, P. (2020). Impact of online mental health screening tools on help-seeking, care receipt, and suicidal ideation and suicidal intent: Evidence from internet search behavior in a large cohort. *Journal of Psychiatric Research*, 145. https://doi.org/10.1016/j.jpsychires.2020.11.010

5. Jacobson, N.C., **Lekkas, D.**, Price, G., Heinz, M.V., Song, M., O'Malley, AJ., and Barr, P. (2020). Flattening the mental health curve: COVID-19 stay-at-home orders result in alterations in mental health search behavior in the United States. *JMIR Mental Health*, 7(6). https://doi.org/10.2196/19347

4. Gao, Z., Ducos, P., Ye, H., Zauberman, J., Sriram, A., Yang, X., Wang, Z., Mitchell, M., **Lekkas, D.**, Brisson, D., and Johnson, ATC. (2020). Graphene transistor arrays functionalized with genetically engineered antibody fragments for Lyme disease diagnosis. *2D Materials*, 7(2). https://doi.org/10.1088/2053-1583/ab5dce

3.   Sarantopoulou, D., Tang, S.Y., Ricciotti, E., Lahens, N.F., **Lekkas, D.**, Schug, J., Guo, X.S., Paschos, G.K., FitzGerald, G.A., Pack, A.I., and Grant, G. (2019). Comparative evaluation of RNA-Seq library preparation methods for strand-specificity and low input. *Scientific Reports*, 9. https://doi.org/10.1038/s41598-019-49889-1

2.   **Lekkas, D.** and Paschos, G.K. (2019). The circadian clock control of adipose tissue physiology and metabolism. *Autonomic Neuroscience: Basic & Clinical*, 219: 66-70. https://doi.org/10.1016/j.autneu.2019.05.001

1.   Paschos, G.K., Tang, S.Y., Theken, K.N., Li, X., Verginadis, I., **Lekkas, D.**, Herman, L., Yan, W., Lawson, J., and FitzGerald, G.A. (2018). Cold-induced browning of inguinal white adipose tissue is independent of adipose tissue cyclooxegygenase-2. *Cell Reports*, 24(4): 809-814. https://doi.org/10.1016/j.celrep.2018.06.082

MANUSCRIPTS UNDER REVIEW

4.   Collins, A.C.[†], **Lekkas, D.** [†], Heinz, M.V.[†], Annor, J.E., Ruan, F., and Jacobson, N.C. (2024). ChatGPT as Therapy: A statistical and network-based thematic profiling of shared experiences, attitudes, and beliefs on Reddit. *Human Computer Interactions.*

3.   **Lekkas, D.**, Collins, A., Heinz, M.V., Price, G.D., Griffin, T.Z., Pillai, A., Nepal, S., Campbell, A., and Jacobson, N.C. (2024). Acute suicidal ideation in context: Highlighting sentiment-based markers through the diary entries of a clinically depressed sample. *BMC Psychiatry.*

2.   **Lekkas, D.**, Heinz, M.V., Collins, A.C., Oh, J.Y.*, Bryan, A., and Jacobson, N.C. (2024). When widespread crises are personally relevant: A longitudinal mixed model analysis of COVID perceived stress in a sample with major depressive disorder. *Journal of Clinical Psychology.*

1.   Collins, A., **Lekkas, D.**, Nemesure, M.D., Griffin, T.Z., Price, G.D., Pillai, A., Nepal, S., Heinz, M.V., Campbell, A.T., and Jacobson, N.C. (2024). Semantic signals in self-reference: The detection and prediction of depressive symptoms from the daily diary entries of a clinically depressed sample. *Journal of Psychopathology and Clinical Science.*

HONORS, AWARDS, & FELLOWSHIPS

University Graduate Fellowship, Dartmouth College	2019-2024
Gelb Scholarship in Bioinformatics, University of the Sciences	2017-2018, 2018-2019
Dean's List, University of Pennsylvania	2008-2009, 2011-2012, 2013-2014
Valedictorian, Deptford Township High School	2008

FORMAL TEACHING EXPERIENCE

Instructor

Comparative Vertebrate Anatomy Lab (BIOL 336)	University of Pennsylvania	Spring 2013-2019 (7 terms)

Teaching Assistant

Longitudinal Data Analysis (QBS 126)	Dartmouth College	Spring 2023 (1 term)
Bioinformatics I (QBS 146)	Dartmouth College	Spring 2021 (1 term)
Statistics for Biologists (BIOL 446)	University of Pennsylvania	Fall 2016 (1 term)
Vertebrate Physiology (BIOL 215)	University of Pennsylvania	Fall 2016 (1 term)
Humans & the Environment (BIOL 140/440)	University of Pennsylvania	Fall 2016 (1 term)
Evolutionary Biology (BIOL 230)	University of Pennsylvania	Spring 2015 (1 term)
Organismal Biology Lab (BIOL 124)	University of Pennsylvania	Spring 2014 (1 term)