

## CURRICULUM VITAE

# Damien Lekkas, Ph.D.

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## EDUCATION

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2024

### Dartmouth College

Ph.D., Quantitative Biomedical Sciences

Dissertation Advisor: Nicholas C. Jacobson, Ph.D.

Dissertation Title: *Misery's Company: Modeling the Public and Private Faces of Suicidal Thought and Behavior in the Digital Era*

2019

### University of the Sciences in Philadelphia

M.S., Bioinformatics

Advisor: Zhijun Li, Ph.D.

2014

### University of Pennsylvania

M.S., Anthropology

Thesis Advisor: Janet Monge, Ph.D.

Thesis Title: *Expressions of a Cranial Aperture*

B.A., Physical Anthropology and Ecology & Evolutionary Biology

Minor in Cognitive Science

Advisors: Janet Monge, Ph.D. and Arthur E. Dunham, Ph.D.

*Magna cum laude*

## ACADEMIC APPOINTMENTS

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Mar 2025 –

### Research Assistant Professor

Department of Medical Social Sciences, Feinberg School of Medicine, Northwestern University

## RESEARCH INTERESTS

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data-driven mental health initiatives; digital interventions; digital phenotyping; internet of things; suicide; applied machine learning; natural language processing; network analysis; statistical modeling; mobile sensing; passively-collected longitudinal data; ecological momentary assessment

## PUBLICATIONS

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N = 32 published or forthcoming (h-index: 14, i10-index: 17)

\* Denotes student mentee; † Denotes equal co-authorship

### Peer-Reviewed Articles

#### 2024

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>

**2023**

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. (2023). 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>

**2022**

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>

**2021**

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>

**2020**

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>

**2019**

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 cyclooxygenase-2. *Cell Reports*, 24(4): 809-814. <https://doi.org/10.1016/j.celrep.2018.06.082>

## **MANUSCRIPTS UNDER REVIEW**

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7. Paschos, G.K., Lordan, R., Hollingsworth, T., **Lekkas, D.**, Kelch, S., Loro, E., Verginadis, I., Khurana, T., Sengupta, A., Weljie, A., and FitzGerald, G.A. Brown adipose tissue thermogenesis rhythms are driven by the SCN independent of adipocyte clocks.
6. Haddox, D., Psychometric Properties and Validity of a Mobile Patient Health Questionnaire-9 (MPHQ-9) for Ecological Momentary Assessment in Depressed Adults.
5. Lampe, E.W., Collins, A.C., Lee, A., Enbar-Salo, N., Griffin, T.Z., Pillai, A., Heinz, M.V., **Lekkas, D.**, Nemesure, M.D., Mackin, D.M., Nepal, S., Campbell, A.T., and Jacobson, N.C. Interindividual differences in digital phenotypes of major depressive disorder: A passive sensing study using smartphone and wearable sensor data.
4. Collins, A.C.<sup>t</sup>, **Lekkas, D.**<sup>t</sup>, Heinz, M.V.<sup>t</sup>, 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.
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.
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.
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.

## **TEACHING AND MENTORING**

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Dartmouth College

2023

Teaching Assistant, Longitudinal Data Analysis (QBS 126), Graduate course (1 term)

2021           Teaching Assistant, Bioinformatics I (QBS 146), Graduate course (1 term)

### **University of Pennsylvania**

2013 – 2019   Instructor, Comparative Vertebrate Anatomy Lab (BIOL 336), Undergraduate course (7 terms)  
2016           Teaching Assistant, Statistics for Biologists (BIOL 446), Undergraduate course (1 term)  
                Teaching Assistant, Vertebrate Physiology (BIOL 215), Undergraduate course (1 term)  
                Teaching Assistant, Humans and the Environment (BIOL 140/440), Undergraduate/graduate  
                course (1 term)  
2015           Teaching Assistant, Evolutionary Biology (BIOL 230), undergraduate course (1 term)  
2014           Teaching Assistant, Organismal Biology Lan (BIOL 124), undergraduate course (1 term)

### **Mentored Master's Graduate Students**

2022 – 2023   Joseph A. Gyorda

### **Mentored Undergraduate Honors Theses**

2023           Piper Stacy

## **CONSULTING AND INDUSTRY**

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2024           Independent Contractor and Consultant, Chat Nexus, Inc.  
*Development of tools for data analytic insights of user interactions with chatbot agents. Aid in directing  
mental health-based product initiatives within the company.*