

**SUSAN A. MURPHY**

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Mallinckrodt Professor of Statistics and of Computer Science,  
Associate Faculty, Kempner Institute, Harvard University  
Cambridge, MA 02138-2901

**RESEARCH INTERESTS:**

Data analytic algorithms and methods for informing sequential decision making in health. In particular for (1) constructing individualized sequences of treatments (a.k.a., adaptive interventions) for use in informing clinical decision making and (2) real time algorithmic development for optimizing individualized sequences of treatments (a.k.a., Just-in-Time Adaptive Interventions) delivered by mobile devices. Causal inference and inference for adaptively sampled data.

**EDUCATION:**

Ph.D., Statistics (1989), “Time-Dependent Coefficients in a Cox-Type Regression Model”  
(P.K. Sen, advisor) University of North Carolina, Chapel Hill, NC

B.S., Mathematics (1980), Louisiana State University, Baton Rouge, LA

**PROFESSIONAL POSITIONS SINCE 2004:**

Fall, 2023-	Associate Faculty, Kempner Institute, Harvard Univ.
Fall, 2021-	Mallinckrodt Professor of Statistics and of Computer Science Harvard Univ.
Fall, 2017-2023	Radcliffe Alumnae Professor at the Radcliffe Institute, Harvard Univ.
Fall, 2017-2021	Professor of Statistics and Professor of Computer Science at the Harvard John A. Paulson School of Engineering and Applied Sciences Harvard Univ.
Fall, 2014-2017	H.E. Robbins Distinguished University Professor of Statistics, Dept of Statistics, Univ. of Michigan
Fall, 2005 -2017	Professor of Psychiatry, Univ. of Michigan
Fall, 2004 - 2014	H.E. Robbins Professor of Statistics, Dept. of Statistics, Univ. of Michigan

**HONORS since 2000:**

**2024:** 2024 Mosteller Statistician of the Year Award, Boston Chapter of the American Statistical Association

**2022:** Leo Breiman Senior Award 2022, ASA section on Statistical Learning and Data Science

**2021:** Van Wijngaarden Award 2021, Centrum Wiskunde & Informatica, The Netherlands

**2019:** Royal Statistical Society Guy Medal in Silver

**2018:** Australian Mathematical Sciences Institute-Statistical Society of Australia 2018 Lecturer

**2018:** R.A. Fisher Award and Lectureship

**2018:** Precision Medicine World Conference 2018 Luminary Award

**2016:** Elected a member of the National Academy of Sciences of the US National Academies

**2014:** Elected a member of the National Academy of Medicine (formerly the Institute of Medicine)  
of the US National Academies

**2014:** Elected a Fellow of the College on Problems in Drug Dependence.  
**2014-2018:** MacArthur Fellow.  
**2011:** Elected a Member of the International Statistical Institute.  
**2007-8:** Invited Fellow at the Center for Advanced Study in the Behavioral Sciences, Stanford University  
**2002:** Elected a Fellow of the American Statistical Association.  
**2000:** Elected a Fellow of the Institute of Mathematical Statistics.

**Keynote, Plenary and Distinguished Lectures since 2010:**

**2023:** Invited Talk, NeurIPS 2023, New Orleans, LA (One of six invited talks)  
**2023:** Keynote, Conference on Digital Experimentation at MIT (CODE@MIT), MIT, Cambridge, MA  
**2023:** Woodroffe Lecture, Statistics Department, University of Michigan, Ann Arbor, MI  
**2023:** Joint AAAI/IAAI-23 Speaker within the plenary session, AAAI 23, Washington DC  
**2022:** Plenary Lecture, 2022 IMS International Conference on Statistics and Data Science, Florence, Italy  
**2022:** Al-Kindi Distinguished Statistics Lectures, KAUST, Saudi Arabia  
**2022:** S. S. Wilks Memorial Lecture, OFRE, Princeton University  
**2022:** Keynote Lecture, 36th Annual Conference of the European Health Psychology Society, Bratislava  
**2022:** Keynote, 2022 ICSA Applied Statistics Symposium 2022  
**2022:** Opening Plenary, Society for Ambulatory Assessment Conference 2022 (Virtual)  
**2022:** Keynote, New England Statistical Society 2022  
**2022:** Odoroff Lecture at University of Rochester Medical Center. Dept of Biostatistics and Computational Biology  
**2022:** Keynote, The AAAI-22 Workshop on AI For Behavior Change held at the Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI-22), (Virtual Presentation)  
**2021:** 2020 H.O. Hartley Award Lecture at Texas A&M (Lecture presented in 2021)  
**2021:** 2021 Myles Hollander Distinguished Lecture, Florida State University  
**2021:** Keynote, Uncertainty in Artificial Intelligence 2021, (Virtual Presentation)  
**2020:** Keynote, Joint Conference of the GMDS & CEN-IBS 2020, Berlin (Virtual Presentation)  
**2020:** Keynote, 13th International Conference on Health Policy Statistics, San Diego  
**2019:** Plenary Lecture at the Statistics and the Life Sciences: Creating a Healthier World, University of Boston Dean's Symposium  
**2019:** Challis Lectures, University of Florida  
**2019:** Duncan Lecture in Applied Mathematics & Statistics, Johns Hopkins University  
**2019:** Keynote at "3rd NorthEast Computational Health Summit," Providence, RI  
**2019:** Distinguished Visitor Lecture Series Speaker at IMS, Singapore (3 lectures)  
**2019:** Keynote at "Big Data for Better Science: Technologies for Measuring Behaviour" meeting. The Royal Scientific Society, London, UK  
**2018:** 2018 Distinguished Lecture in Statistical Sciences, Fields Institute for Research in Mathematical Sciences  
**2018:** Keynote, COLT 2018 in Stockholm, Sweden  
**2018:** Opening Keynote, 2018 Modern Modeling Methods Conference, Storrs CT

**2018:** Harvard Award and Lecture in Psychiatric Epidemiology and Biostatistics, Harvard Program in Brain Health.

**2017:** Keynote Lecture at the Machine Learning in Health Care Workshop, NIPS.

**2017:** David Sprott Distinguished Lecture, Department of Statistics and Actuarial Science, University of Waterloo; Waterloo, Canada.

**2017:** Vice Chancellor for Research Distinguished Lecture, University of Tennessee Health Center; Memphis, TN.

**2017:** Keynote Lecture, Centre for Behaviour Change's 3rd Digital Health Conference; UCL, London

**2016:** Plenary Talk, CLAPEM, San José, Costa Rica

**2016:** Keynote Lecture, IMPACT Symposium IV

**2016:** Keynote Lecture, IEEE Wireless Health

**2016:** Lecture in the NSF Distinguished Lecture Series in Mathematical and Physical Sciences, Washington, DC

**2016:** Plenary Talk, Conference on Statistical Learning and Data Science, Chapel Hill

**2016:** Presented the Henry Seeley White Lectures at Vassar College, NY

**2016:** Association for the Advancement of Artificial Intelligence 2016 Invited Talk, Phoenix, AR (one of 6 invited talks)

**2015:** Plenary Lecturer, ASA Biopharmaceutical 2015 Workshop

**2015:** IMS Wald Lecturer, JSM, Seattle

**2015:** Invited Speaker at the International Conference on Machine Learning (ICML), Lille, Paris (one of three invited speakers)

**2015:** Presented the Keynote Lecture at the Joint ICSA/Greybill Symposium, Ft. Collins

**2015:** Presented the Bernard G. Greenberg Lecture Series, UNC, Chapel Hill

**2015:** Keynote Speaker at the 2015 Doctoral Hooding Ceremony, UNC, Chapel Hill

**2015:** Presented the Bradley Lecture, University of Georgia, Athens

**2014:** Presented the 12th Annual Armitage Lecture, Medical Research Council Biostatistics Unit, Cambridge

**2014:** Presented the G. Snedecor Memorial Lecture, Department of Statistics, Iowa State University

**2014:** Presented the P. Porcelli Lectures, Department of Mathematics, Louisiana State University

**2014:** Presented the R.R. Bahadur Memorial Lectures, Department of Statistics, University of Chicago

**SERVICE TO THE SCIENTIFIC COMMUNITY (mostly since 2010):**

2023-	Member of the Scientific Advisory Board, Institute of Mathematical Statistics, Singapore
2023	Academic Review Committee for the Operations Research Financial Engineering Department, Princeton University
2022-23	Chair, Interest Group (18) on Health and Technology, National Academy of Medicine
2021	Member, External Review Committee of the Data Science Institute, Columbia University
2020	Co-Organizer and Chair, American Academy of Addiction Psychiatry Workshop

	on “Trials and Tribulations in Optimizing mHealth Interventions in Addictions” at the 31st AAAP annual meeting.
2018-2021	President-Elect, President, Past President, Institute of Mathematical Statistics
2015-2021	President-Elect, President, Past President, Bernoulli Society
2017-	External Advisory Board; MIT Institute for Data, Systems and Society
2016-2017	SAMSI Director Search Committee
2016-2017	Local Organizing Committee, 3rd Multi-disciplinary Conference on Reinforcement Learning and Decision Making
Fall, 2015	External Review Committee Member; UC, Berkeley Statistics Dept.
2015	Reviewer for ICML, AAAI (computer science conferences)
2015- 2017	Member, Committee on National Statistics, The National Academies
2015	Member, Organizing Committee for The Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM)
2013-2016	Member, IMS Council
2012	Member, Organizing Committee for Workshop on Future Research Directions in Statistics
2012-2015	SAMSI National Advisory Committee Co-Chair
2011-12	Chair, Committee to Select Editors, AOS
2011	Member, Joint IMS/BS Publications Management Committee
2010	Member of the Scientific Organizing Committee for International Conference on Health Policy Statistics 2011
2009-2010	Member of the NAS Oversight Committee on the Handling of Missing Data in Clinical Trials
2009-2011	Member of the NIMH Interventions Committee for Adult Disorders
2009-2011	Member of the Columbia University HIV Center for Clinical and Behavioral Studies’s external PSMB.
2008-2015	Member of the SAMSI National Advisory Council
2007-2009	Editor of <i>The Annals of Statistics</i> (with B. Silverman)
2007	Co-Editor of a supplemental volume of <i>Drug and Alcohol Dependence</i>

## PUBLICATIONS AND MANUSCRIPTS:

### Articles in Refereed Journals and Refereed Proceedings

(146) Nahum-Shani, I., Greer, Z.M., Trella, A.L., Zhang, K.W., Carpenter, S.M., Ruenger, D., Elashoff, D., Murphy, S.A., Shetty, V. Optimizing an adaptive digital oral health intervention for promoting oral self-care behaviors: Micro-randomized trial protocol. *To appear in Contemporary Clinical Trials*.

(145) Shin, E., Swaroop, S., Pan, W., Murphy, S. and F. Doshi-Velez . Reinforcement Learning Interventions on Boundedly Rational Human Agents in Frictionful Tasks. *Accepted at AA-MAS2024*.

(144) Saengkyongam, S., Pfister, N., Klasnja, P., Murphy, S., Peters, J. Effect-Invariant Mechanisms for Policy Generalization. *To appear in the Journal of Machine Learning Research*.

- (143) Golbus, J.R., K. Gupta, R. Stevens. V.S.E. Jeganathan, E. Luff, J. Shi, W. Dempsey, T. Boyden, B. Mukherjee, S. Kohnstamm, V. Taralunga, V. Kheterpal, S. Murphy, P. Klasnja, S. Kheterpal, B.K. Nallamothu. A Randomized Trial of a Mobile Health Intervention to Augment Cardiac Rehabilitation: The Virtual AppLIcation- supported ENvironment To INcrease Exercise (VALENTINE) Study. *npj Digit. Med.* 6, 173 (2023). <https://doi.org/10.1038/s41746-023-00921-9>. PubMed PMID: 37709933; PubMed Central PMCID: PMC10502072
- (142) Shin E., Klasnja, P., Murphy, S.A. Doshi-Velez, F. Online model selection by learning how compositional kernels evolve. *To appear in Transactions on Machine Learning Research*.
- (141) Carpenter S.M., Greer Z.M., Newman, R., Murphy, S.A., Shetty, V., I. Nahum-Shani Engaging Racial and Ethnic Minorities in Digital Oral Self-Care Interventions: A Formative Research into Messaging Strategies. *JMIR Form Res* 2023;7:e49179 doi:10.2196/49179.
- (140) Cousineau, M., Verter, V., Murphy, S. A., and Pineau, J. (2023). Estimating causal effects with optimization-based methods: A review and empirical comparison. *European Journal of Operational Research*, 304(2):367380.
- (139) K. Karine, P. Klasnja, S. Murphy and B. Marlin Assessing the Impact of Context Inference Error and Partial Observability on RL Methods for Just-In-Time Adaptive Interventions. *Accepted at UAI 2023*
- (138) S. Rathnam, S. Parbhoo, W. Pan, S. Murphy and F. Doshi-Velez The Unintended Consequences of Discount Regularization: Improving Regularization in Certainty Equivalence Reinforcement Learning. *Accepted at ICML 2023*
- (137) E. Cohn, T. Qian, and S. Murphy Sample Size Considerations for Micro-Randomized Trials with Binary Proximal Outcomes. (2023) *Statistics in Medicine*, 2023 Jul 20; 42(16): 27772796. PMCID: PMC10314739
- (136) Lipschitz, J.M., Pike, C.K., Hogan, T.P., Murphy, S.A. and K.E. Burdick. The engagement problem: A review of engagement with digital mental health interventions and recommendations for a path forward. *Curr Treat Options Psych* 10, 119135 (2023). <https://doi.org/10.1007/s40501-023-00297-3>
- (135) Trella, A., Zhang, K., Nahum-Shani, I., Shetty, V., Doshi-Velez, F. and S. Murphy. (2023) Reward Design For An Online Reinforcement Learning Algorithm Supporting Oral Self-Care. *Accepted at IAAI 2023*
- (134) Liao, P., Qi, Z., Wan, R., Klasnja, P., and Murphy S. (2022). Batch Policy Learning in Average Reward Markov Decision Processes. *Annals of Statistics* vol. 50, No. 6, 3364-3387. PMCID: PMC10072865
- (133) A. Trella, K. Zhang, I. Nahum-Shani, V. Shetty, F. Doshi-Velez, S. Murphy Designing Reinforcement Learning Algorithms for Digital Interventions: Pre-implementation Guidelines. *Algorithms* 2022. 15(8), 255; <https://doi.org/10.3390/a15080255> (special issue on Algorithms in Decision Support Systems). NIHMSID: NIHMS 1825651. PMC9881427
- (132) Coppersmith, D.L., Dempsey, W., Kleiman, E.M., Bentley, K.H., Murphy, S.A., & Nock, M.K. (2022) Just-in-Time Adaptive Interventions for Suicide Prevention: Promise, Challenges, and Future Directions, *Psychiatry*, DOI: 10.1080/00332747.2022.2092828. 2022. 85:317-333.
- (131) Bertsimas D., Klasnja, P., Murphy, S., & L. Na (2022) Data-driven Interpretable Policy Construction for Personalized Mobile Health 2022 IEEE International Conference on Digital Health (ICDH), pp. 13-22, doi: 10.1109/ICDH55609.2022.00010. Won Best Paper Award!

- (130) Nahum-Shani, I., Shaw, S., Carpenter, S., Murphy, S.A. and Yoon, C. Engagement in a Digital World. *American Psychologist*. Oct 2022;77(7): 836-852.
- (129) Qian, T., Walton, A., Collins, L.M., Klasnja, P., Lanza, S., Nahum-Shani, I., Rabbi, M., Russell, M., Walton, M.A., Yoo, H. and Murphy, S.A. The Micro-Randomized Trial for Developing Digital Interventions: Experimental Design and Data Analysis Considerations *Psychological Methods*, 27(5), 874894, 2022, Advance online publication. <https://doi.org/10.1037/met0000283>
- (128) K. Zhang, L. Janson and Murphy, S.A. Statistical Inference with M-Estimators on Adaptively Collected Data. *Adv Neural Inf Process Syst*. 2021 Dec; 34: 74607471 PMC9232184.
- (127) Nahum-Shani, I., Potter, L.N., Lam, C.Y., Yap, J., Moreno, A., Stoffel, R., Wu, Z., Wan, N., Dempsey, W., Kumar, S., Ertin, E., Murphy, S.A., Rehg, J., Wetter, D.W. The Mobile-Assistance for Regulating Smoking (MARS) Micro-Randomized Trial Design Protocol. *Contemporary Clinical Trials* 2021 Nov;110:106513. doi: 10.1016/j.cct.2021.106513. Epub 2021 Jul 24.
- (126) A. M. Psihogios, M. Rabbi, A. Ahmed, E. R. McKelvey, Y. Li, J. Laurenceau, S P Hunger, L Fleisher, A Pai, L. A. Schwartz, S.A. Murphy & L. P. Barakat. Ecological Momentary Assessment to Understand Adolescent and Young Adult 6-mercaptopurine Adherence and mHealth Engagement during Cancer Treatment: A Protocol Paper. *JMIR Research Protocols* 2021;10(10):e32789
- (125) Yao, J., Brunskill, E., Pan, W., Murphy, S.A., Doshi-Velez, F., Power Constrained Bandits. *Machine Learning in Health Care 2021. Proceedings of Machine Learning Research* 2021; 149:209-259.
- (124) Tomkins, S., Liao, P., Klasnja, P. and Murphy, S.A., Intelligent Pooling: Practical Thompson Sampling for mHealth. *Mach Learn.* (2021). PMCID:PMC849236
- (123) Nahum-Shani, I., Rabbi, M., Yap, J., Philyaw-Kotov, M.L., Klasnja, P., Bonar, E.E., Cunningham, R.M., Murphy, S.A. and M.A. Walton., Translating Strategies for Promoting Engagement in Mobile Health: A Proof-of-Concept Micro-Randomized Trial. *Health Psychology* 40(12), 974987.
- (122) Zhang, K.W., Janson, L. and Murphy, S.A., Inference for Batched Bandits. *34th Conference on Neural Information Processing Systems (NeurIPS 2020)*, Vancouver, Canada
- (121) Qian, T., Yoo, H., Klasnja, P., Almirall, D. and Murphy, S.A. (2020). Estimating Time-Varying Causal Excursion Effects in Mobile Health with Binary Outcomes with discussion. *Biometrika* Volume 108, Issue 3, September 2021, Pages 507-527. Rejoinder: *Biometrika* Volume 108, Issue 3, September 2021, Pages 551-555.
- (120) Bidargaddi, N., Schrader, G., Klasnja, P., Licinio, J. and S.A. Murphy. Designing mHealth interventions for precision mental health support. *Translational Psychiatry* (2020)10:222 <https://doi.org/10.1038/s41398-020-00895-2>
- (119) Kroska, E.B., Hoel, S., Victory, A., Murphy, S.A., McInnis, M.G., Stowe, Z.N. and A. Cochran. Optimizing Acceptance and Commitment Therapy Microintervention via a Mobile App with Two Cohorts: Protocol for Micro-Randomized Trials, *JMIR Res Protoc* 2020 Sep 23;9(9):e17086.
- (118) Liao, P., Klasnja, P. and Murphy, S.A., Off-Policy Estimation of Long-Term Average Outcomes with Applications to Mobile Health. *Journal of the American Statistical Association* 2021;116(533):382-391.

- (117) Liao, P., Greenewald K., Klasnja, P. and Murphy, S.A., Personalized HeartSteps: A Reinforcement Learning Algorithm for Optimizing Physical Activity. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* March 2020 Article No.: 18.
- (116) Rabbi, M., Li, K., Yan, H.Y., Hall, K., Klasnja, P. and Murphy, S.A., ReVibe: A context-assisted evening recall approach to improve self-report adherence. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* December 2019 Article No.: 149. <https://doi.org/10.1145/3369806>. PubMed Central PMCID: PMC8218636.
- (115) Dempsey, W., Liao, P., Kumar, S. and Murphy, S.A., The stratified micro-randomized trial design: sample size considerations for testing nested causal effects of time-varying treatments *Annals of Applied Statistics* (2020) 14 (2): 661-684 .
- (114) Qian, T., Klasnja, P. and Murphy, S.A., Linear mixed models under endogeneity: modeling sequential treatment effects with application to a mobile health study. *Statistical Science with Discussion*. (2020) 35, (3): 375-390. Rejoinder pgs: 400-403. PMCID: PMC7596885
- (113) Seewald, N., Smith S., Lee A., Klasnja P. and Murphy, S.A., Practical Considerations for Data Collection and Management in Mobile Health Micro-randomized Trials. *Statistics in Biosciences*. Published online 01.05.2019. <https://doi.org/10.1007/s12561-018-09228-w>
- (112) Liao, P., Dempsey, W., Sarker, H., Hossain S.M., alAbsi, M., Klasnja, P., and Murphy, S.A., Just-in-Time But Not Too Much: Determining Treatment Timing in Mobile Health, *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.*, Vol. 2, No. 4, Article 179. December 2018. PMCID: PMC6380673
- (111) Klasnja, P., Smith, S., Seewald, N.J., Lee, A., Hall, K., Luers, B., Hekler, E.B. and Murphy, S.A. Efficacy of contextually-tailored suggestions for physical activity: A micro-randomized optimization trial of HeartSteps *Annals of Behavioral Medicine*. 2018 Sep 5. [Epub ahead of print] PubMed PMID: 30192907; PubMed Central PMCID: PMC6401341
- (110) Bidargaddi N, Almirall D, Murphy, S.A., Nahum-Shani I, Kovalcik M, Pituch T, Maaieh H and Strecher V. To prompt or not to prompt? A micro-randomized trial of time-varying push notifications to increase proximal engagement with a mobile health application *JMIR mHealth and uHealth*;6(11):e10123 DOI: 10.2196/10123
- (109) Rabbi M, Philyaw-Kotov M, Cunningham R, Bonar EE, Nahum-Shani I, Klasnja P, Walton M, **Murphy**, S.A., Towards increasing engagement in substance use data collection: Development of the SARA app and protocol for a micro-randomized trial with adolescents and emerging adults. *JMIR Res Protoc* 2018;7(7):e166 URL: <https://www.researchprotocols.org/2018/7/e166>. doi:10.2196/resprot.9850 <http://dx.doi.org/10.2196/resprot.9850>
- (108) Walton, A, Nahum-Shani, I, Crosby, L, Klasjna, P and **Murphy**, S.A., (2018). Optimizing Digital Integrated Care via MicroRandomized Trials. *Clinical Pharmacology & Therapeutics*, 104 (1), 53-58. <http://doi.org/10.1002/cpt.1079> NIHMS ID 956009 PMCID: PMC5995647
- (107) Luers, B., Klasnja P. and **Murphy**, S.A., Standardized effect sizes for preventive mobile health interventions in micro-randomized trials. *Prevention Science*. 2018 Jan 9. doi: 10.1007/s11121-017-0862-5.PMCID: PMC6037616
- (106) Greenewald, K., Tewari A., Klasnja P. and bf Murphy, S.A. Action Centered Contextual Bandits. *Adv Neural Inf Process Syst*. 2017 Dec; 30: 59735981, PMC5719505

- (105) Dempsey, W.H., Moreno, A., Scott, C.K., Dennis, M.L., Gustafson, D.H., **Murphy, S.A.** and Rehg, J.M., iSurvive: An Interpretable, Event-time Prediction Model for mHealth, Proceedings of the 34th International Conference on Machine Learning, Sydney, Australia, PMLR 70, 2017. NIHMS922395. PMC6430609.
- (104) Boruvka, A., Almirall, D., Witkiewitz, K. & **Murphy, S.A.**. Assessing Time-Varying Causal Effect Moderation in Mobile Health, *Journal of the American Statistical Association*, 113:523, 1112-1121, Accepted author version posted online: 31 Mar 2017 <http://dx.doi.org/10.1080/01621459.2017.1305274>
- (103) Nahum-Shani, I., Smith, S.N. Spring, B.J., Collins, L.M., Witkiewitz, K., Tewari, A., & **Murphy, S.A.**. (2018). Just-in-Time Adaptive Interventions (JITAIs) in Mobile Health: Key Components and Design Principles for Ongoing Health Behavior Support. *Ann Behav Med*. 2018 May 18;52(6):446-462. doi: 10.1007/s12160-016-9830-8. PMCID: PMC5364076
- (102) Bekiroglu, K., Lagoa, C., **Murphy, S.A.** & S. T. Lanza, S.T. Control Engineering Methods for the Design of Robust Behavioral Treatments, (2016) *IEEE Transactions on Control Systems Technology*. Vol 25(3):979-990. Epub 2016 Jun 28. PMCID: PMC5362168
- (101) Dempsey, W., Liao, P., Klasnja, P., Nahum-Shani, I., **Murphy, S.A.** (2015). Randomized trials for the Fitbit generation, Significance. 12(6):20-23. PMCID: PMC4721268
- (100) Liao,P., Klasnja, P., Tewari, P., **Murphy, S.A.**, (2015) Micro-Randomized Trials in mHealth, *Statistics in Medicine*. Dec 28. doi: 10.1002/sim.6847. [Epub ahead of print] PubMed PMID: 26707831
- (99) Klasnja, P., Hekler, E.B., Shiffman, S., Boruvka, A., Almirall, D., Tewari, A. and **Murphy, S.A.** (2015). Micro-randomized trials: An experimental design for developing just-in-time adaptive interventions, *Health Psychology*. Vol 34(Suppl):1220-1228. doi: 10.1037/hea0000305. PubMed PMID: 26651463; PubMed Central PMCID: PMC4732571
- (98) Lu, X., Lynch, K.G., Oslin, D.W. and **Murphy, S.A.** (2015) Comparing Treatment Policies with Assistance from the Structural Nested Mean Model. *Biometrics*. Sep 13. [Epub ahead of print] PubMed PMID: 26363892
- (97) Kumar, S., Abowd, G., Abraham, W., al Absi, M., Beck, J.G., Chau, D.H., Condie, T., Conroy, D.E., Ertin, E., Estrin, D., Ganesan, D., Lam, C., Marlin, B., Marsh, C.B., **Murphy, S.A.**, Nahum-Shani, I., Patrick, K., Rehg, J., Sharmin, M., Shetty, V., Sim, I., Spring, B., Srivastava, M., Wetter, D. Center of Excellence for Mobile Sensor Data-to-Knowledge (MD2K)(2015). *Journal of the American Medical Informatics Association*. 22(6): 1137-1142 First published online: 3 July 2015
- (96) Gunlicks-Stoessel, M., Mufson, L., Westervelt, A., Almirall, D. and **S.A. Murphy** (2015). A Pilot SMART for Developing an Adaptive Treatment Strategy for Adolescent Depression. *Journal of Clinical Child & Adolescent Psychology*. 2015 Mar 18:1-15. [Epub ahead of print] PMID: 25785788
- (95) Kilbourne, A. M., Almirall, D., Eisenberg, D., Waxmonsky, J., Goodrich, D. E., Fortney, J. C., Kirchner, J. E., Solberg, L. I., Main, D., Bauer, M.S., Kyle, J., **Murphy, S.A.**, Nord, K.M., and M. R. Thomas (2014). Protocol: Adaptive Implementation of Effective Programs Trial (ADEPT): cluster randomized SMART trial comparing a standard versus enhanced implementation strategy to improve outcomes of a mood disorders program. *Implementation Science*. 2014 Sep 30;9:132. PMCID: PMC4189548



- (94) Laber, E., D. Lizotte, M. Qian, W.E. Pelham and **S.A. Murphy** (2014). Dynamic treatment regimes: technical challenges and applications. *Electronic Journal of Statistics, with discussion*. Vol. 8, No. 0, 1225-1272. PMID: PMC4209714
- (93) Shortreed, S.M., E. Laber, T.S. Stroup, J. Pineau, & **S.A. Murphy** (2014). A multiple imputation strategy for sequential multiple assignment randomized trials. *Statistics in Medicine* Oct 30;33(24):4202-14. PMID: PMC4184954
- (92) Kasari C., Kaiser A., Goods K., Nietfeld J., Mathy P., Landa R., **S.A. Murphy**, Almirall D. (2014) Communication Interventions for Minimally Verbal Children with Autism: Sequential Multiple Assignment Randomized Trial. *Journal of the American Academy of Child and Adolescent Psychiatry* Jun;53(6):635-46. PMID: PMC4030683
- (91) Almirall D., Nahum-Shani, I., Sherwood, N.E. & **S.A. Murphy** (2014). Introduction to SMART Designs for the Development of Adaptive Interventions: With Application to Weight Loss Research. *Translational Behavioral Medicine: Practice, Policy and Research*. Sep; 4(3): 260274. PMID: PMC4167891
- (90) Lagoa, C.M., Bekiroglu, K., Lanza, S.T. & **S.A. Murphy** (2014) Designing Adaptive Intensive Interventions Using Methods from Engineering. *Journal of Consulting and Clinical Psychology* Oct;82(5):868-78. PMID: PMC4176810
- (69) Kumar, S., W.J. Nilsen, A. Abernethy, A. Atienza, K. Patrick, M. Pavel, W.T. Riley, A. Shar, B. Spring, D. Spruijt-Metz, D. Hedeker, V. Honavar, R. Kravitz, R. Craig Lefebvre, D.C. Mohr, **S.A. Murphy**, C. Quinn, V. Shusterman, D. Swendeman, (2013) Mobile Health Technology Evaluation, The mHealth Evidence Workshop. *Am J Prev Med* 45(2):228-236. PMID: PMC3803146
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## **RESEARCH GRANTS AND AWARDS SINCE 2015:**

Project Leader of Project 3 and PI of Harvard Site P50DA054039 (9/01/2021-6/30/2026), NIDA

“Continual Optimization and Personalization of Just-in-Time Adaptive Interventions for SUD Prevention, Treatment and Recovery.” In the modern, post-pandemic world, digital technology is becoming an increasingly important vehicle for the delivery of substance use disorder and HIV prevention, treatment, and recovery services. The long term goal of the proposed project is to enable digital health technology to deliver intervention services with unprecedented effectiveness and sustainability. We propose to integrate ideas from behavioral science and artificial intelligence to develop methodology for (1) continual optimization of just-in-time adaptive digital health interventions in response to societal changes and evolving population treatment needs and (2) personalized just-in-time adaptive digital health interventions to each individuals evolving treatment needs. This will enable a second generation of just-in-time adaptive digital health interventions with enhanced and highly sustainable effectiveness. To achieve these goals we aim to promote sustainable intervention effectiveness and engagement by integrating approaches from artificial intelligence namely reinforcement learning to develop algorithms that continually optimize mobile health interventions over time. The overall M-PIs are I. Nahum-Shani, D. Almirall, L. Collins and S. Murphy

Project Leader of Project 2 and PI of Harvard Site P41EB028242(7/15/2020-3/31/2024), NIBIB

“Dynamic Optimization of Continuously Adapting mHealth Interventions via Prudent, Statistically Efficient, and Coherent Reinforcement Learning.” The long-term goal of this project is to help individuals manage chronic health issues as they go about their daily life. This project will develop artificial intelligence software for mobile health apps. Mobile health apps can play a critical role in helping people in managing their health, but only if the help is personalized to each individuals needs, and only if people continue to use the app when they need help. To personalize the app and to avoid aggravating individuals Dr. Murphys team will develop artificial intelligence algorithms that prudently determine when and in which settings the app will reach out to the individual to provide helpful suggestions, reminders and messages. Dr. Murphy will collaborate with ongoing NIH-funded projects concerning individuals who are struggling with chronic health issues at the University of Michigan, UMass Medical School, and Pennsylvania State University to evaluate and refine the artificial intelligence algorithms. This project will provide to the mobile health research community open-source software solutions consisting of smartphone and cloud computing components in order to accelerate improvements in the usefulness of mobile health apps for individuals. The overall PI is Santosh Kumar.



Co-Investigator UG3DE028723 (8/1/2019-4/15/2022) UH3DE028723 (4/15/2022-3/31/2027)  
DE

“Personalized Digital Behavior Change Interventions to Promote Oral Health.” The goal of this grant is to support at-risk individuals execute high quality dental brushing behaviors. We will leverage tracking capabilities of our innovative eBrush platform to remotely monitor tooth-brushing activities in home settings. Using the 2x2x4 OHI and eBrush as foundational elements, we will develop and evaluate the effectiveness of personalized Digital Oral Health Interventions (DOHI) for promoting ideal OHBs in at-risk individuals. In the UG3 phase, we will build out the technologic infrastructure for collecting brushing data and delivering the DOHI. Then, we will engage target end-users in the co-design of an app for oral self-care and establish the usability and feasibility of the system. In the UH3 phase, we will build and validate computational models to infer the quality of OHBs from brushing data and personalize the DOHI. Using a cohort of 130, we will conduct a 10-week Micro-Randomized Trial to optimize the adaptive tailoring of engagement strategies. Finally, we will evaluate effectiveness of the computationally-driven, adaptive DOHI in promoting sustained engagement in the 2x2x4 OHB. We hypothesize that a dynamic and personalized DOHI will be more effective than traditional, static, clinician-delivered OHI in improving oral health and adherence to 2x2x4 OHBs. We will test our hypothesis through a 6-month, pragmatic, randomized, controlled, parallel-group clinical trial. The PI is Vivek Shetty.

Co-Investigator U01 CA229437 (9/1/2018-8/31/2022) NCI  
“Novel Use of mHealth Data to Identify States of Vulnerability and Receptivity to JITAIs.” The goal of this grant is to systematically investigate the nature of the states of individual vulnerability and receptivity as well as how knowledge of these states can be used to optimize real-time engagement in self-regulatory activities aimed at helping individuals quit smoking. This project will use a racially/ethnically diverse collection of real time, real world data on individuals attempting to quit smoking to investigate how the temporal dynamics and interactions of emotions, self-regulatory capacity, context, and other factors can be used to detect states of vulnerability to a lapse and states of receptivity to engage in self-regulatory activities. We will investigate how knowledge of these states can be used to optimize real-time engagement in self-regulatory activities by conducting a Micro-Randomized Trial (MRT) enrolling 150 smokers attempting to quit. Utilizing a mobile smoking cessation app, the MRT will randomize each individual multiple times per day to either (a) no intervention prompt; (b) a prompt recommending engagement in brief (low effort) strategies; or (c) a prompt recommending a more effortful practice of self-regulation strategies. The proposed research will be the first to yield a comprehensive conceptual, technical, and empirical foundation necessary to develop effective JITAIs based on dynamic models of vulnerability and receptivity. Overall Co-PIs are Inbal Nahum-Shani and David Wetter.

Principal Investigator R01 AA023187 (9/1/2015-8/31/2020) NIAAA  
“Data-Based Methods for Just-In-Time Adaptive Interventions in Alcohol Use.” The purpose of this proposal is develop, and bring to fruition, methods for using data to optimize mobile interventions aimed at preventing, treating and supporting the recovery from alcohol use disorders. The goal of this project is (1) to develop and evaluate data analysis methods and optimization algorithms that can reside on the mobile device and that, as an individual experiences the mobile intervention and provides responses, will optimize the timing and selection of the behavioral intervention to the individual; (2) to develop data analysis methods and optimization algorithms that can be used following a clinical study involving the mobile intervention to further optimize the intervention; and (3) to disseminate and illustrate the developed methods and algorithms to the clinical science community so as to maximize clinical impact.

Project Leader of Research Component and PI of Michigan Site P50 DA039838(09/01/2015 - 08/31/2020) NIDA

“Innovative Methods for Constructing Just-In-Time Adaptive Interventions.” The long-term goal of this component is to improve public health by facilitating the evidence-based construction of effective, individualized mobile substance use prevention and intervention services. This component develops data analytic methods that will enable drug abuse prevention and services scientists to more effectively adapt interventions to individuals changing needs over time and more effectively expand the reach of their interventions. The overarching goal of this component is to integrate ideas from statistics, computer science, and behavioral science to develop data analytic methodologies that will (i) enable scientists to construct more effective mobile interventions for delivery of SUD/HIV prevention and SUD recovery services, and (ii) inform development of more dynamic and nuanced behavioral theories. Overall PI is Linda Collins.

Co-Investigator R01 DA039901 01 (09/01/2015 - 07/31/2020) NIDA

“Novel Longitudinal Methods for SMART Studies of Drug Abuse and HIV.” The treatment of drug use and HIV often requires sequential, individualized decisions concerning the type or delivery of treatments. The methods developed in this project will improve clinical and public health outcomes by enabling drug use and HIV scientists to develop more potent approaches to guide the sequential, individualization of drug use and HIV treatments. The Co-PIs are I. Nahum-Shani and D. Almirall

Co-Investigator R01 HL125440 (9/1/2014-8/31/2019) NIH/NHLBI/NIA

“Heart Steps: Adaptive mHealth interventions for physical-activity maintenance.” In this project, we will conduct a micro-randomized trial and using this data, design, and evaluate a personalized, adaptive mHealth intervention that leverages frequent interactions that people have with their mobile phones to enable individuals with heart disease to stay focused on their health goals, engage in opportunistic physical activity throughout the day, and build robust and sustainable physical-activity habits that can help reduce and keep down their cardiac risks. PI is P. Klasnja.

Co-Investigator and PI of Michigan Component U54EB020404 (07/01/14-06/30/18) NIBIB through funds provided by the trans-NIH Big Data to Knowledge (BD2K) initiative ([www.bd2k.nih.gov](http://www.bd2k.nih.gov)). “Centers of Excellence for Big Data Computing in the Biomedical Science.” The goal of this project is to design a micro-randomized trial and evaluate statistical learning methods for using sensor data to identify precipitants and antecedents of adverse behavior as well as predict times of high risk so as to inform future development of a just-in-time adaptive intervention. Overall PI is S. Kumar

Co-Investigator (09/04/2012-05/31/2017) NICHD

“Adaptive Interventions for Minimally Verbal Children with ASD in the Community” The overarching aim of this Network study is to construct an adaptive intervention that utilizes two efficacious interventions (JASP-EMT and CORE-DTT) that rely on distinct intervention procedures and that show promise for optimizing the number of unique socially communicative and spontaneously spoken words in minimally verbal children with ASD. JASP-EMT (Joint Attention, Symbolic Play and Enhanced Milieu Teaching) focuses on creating a context for joint engagement within naturally occurring, child-led play activities. CORE-DTT (discrete trial training for core features of ASD) emphasizes didactic, adult-led instruction. The study utilizes a novel sequential multiple assignment randomized trial to evaluate and construct an optimal adaptive intervention. PI is C. Kasari.

Co-Investigator (12/01/2013-11/30/2018) NIMH

“Improving Mental Health Outcomes: Building an Adaptive Implementation Strategy” The overarching goal of this study is to build the most cost-effective adaptive implementation intervention involving Replicating Effective Programs (REP) and the augmentation of the External Facilitation (EF) and Internal Facilitation (IF) roles to improve patient outcomes and the uptake of an evidence-based program (EBP) for mood disorders (Life Goals-LG) in community settings. PI is A. Kilbourne.

## **PRESENTATIONS:**

<u>Invited Papers Presented at Professional Meetings since 2020</u>		
Jan, 2024	1st MBZUAI Workshop on Statistics for the Future of AI MBZUAI, Abu Dhabi, UAE	Smart Digital Health
Dec, 2023	Goal-Conditioned RL Workshop, NeurIPS 2023 New Orleans, LA	We used Reinforcement Learning; but did it work?
Dec, 2023	NeurIPS 2023 New Orleans, LA	Online Reinforcement Learning in Digital Health Interventions
Nov, 2023	ABCT 2023 Seattle (virtual)	A pJITAI for MiWaves!
Nov, 2023	Keynote, Conference on Digital Experimentation at MIT (CODE@MIT)	We used Reinforcement Learning; but did it work?
Sept, 2023	Keynote, MGH Post-COVID AI Symposium	We used Reinforcement Learning; but did it work?
Sept, 2023	STORFest Celebration UNC	Dyadic Reinforcement Learning
June, 2023	2022 Leo Breiman Senior Award Lecture, JSM 2023, Toronto	Personalization via Reinforcement Learning in Digital Health
June, 2023	Keynote, 2023 Thomas R. Ten Have Symposium on Statistics in Mental Health, Boston	We used Reinforcement Learning; but did it work?
May, 2023	Keynote, The Israel Statistics and Data Science Association, Tel Aviv	We used Reinforcement Learning; but did it work?
Feb, 2023	Workshop on Reinforcement Learning Ready for Production, AAAI 23	Trials and Tribulations: Ensuring the Oralytics RL Algorithm is Ready for Production!
Feb, 2023	AAAI 23 Washington, DC	We used Reinforcement Learning; but did it work?
Dec, 2022	Keynote, 2022 ICSDS Italy	Inference for Longitudinal Data After Adaptive Sampling
June, 2022	Keynote, 2022 ICSA Applied Statistics Symposium	Inference for Longitudinal Data After Adaptive Sampling
May, 2022	Keynote, NESS 2022	Inference for Longitudinal Data After Adaptive Sampling
March 2022	German Consortium	Assessing Personalization

	in Statistics (DAGStat) (Virtual)	in Digital Health
Dec. 2021	Australian Trials Methodology Conference (Online/Virtual)	Assessing Personalization in Digital Health
Oct., 2021	Design and Analysis of Experiments Conference	Micro-Randomized Trials & Online Decision Making Algorithms
Aug, 2021	JSM 2021	Assessing Causal Inference Using Adaptively Collected Data
July, 2021	UAI 2021	We used RL but..... Did it work?!
June, 2021	Statistical learning methods in modern AI Tianyuan Mathematical Center Northwest China	We used RL but..... Did it work?!
May, 2021	Frontiers of Causal Inference in Data Science: Perspectives from Leaders in Tech and Academia	We used RL but..... Did it work?!
May, 2021	Workshop on AI for Public Health, International Conference on Learning Representations, 2021	Assessing Personalization in Digital Health
Feb., 2021	The Obesity Society 2021 Preconference Workshop Synergistic Rigor in the Intersection of Epidemiology & Obesity(Virtual)	Using Mobile Health Interventions to Support Individual Decision Making
Feb., 2021	AAAI 2021 Trustworthy AI for Healthcare Workshop (Virtual)	Assessing Personalization in Digital Health
Dec., 2020	NeurIPS 2020 Machine Learning for Mobile Health Workshop (Virtual)	Assessing Personalization in Digital Health
Dec., 2020	NeurIPS 2020 Deep RL workshop (Virtual)	We used RL... but.... did it work?!
Nov., 2020	Sixth Seattle Symposium in Biostatistics (Virtual)	Challenges in Developing Learning Algorithms to Personalize Treatment in Real Time
Nov., 2020	4th Annual Mobile & Electronic Health-ARC Symposium Boston University	Data, Personalization, Digital Health!
Sept., 2020	Joint Convergence of the GMDS & CEN-IBS 2020 (Virtual Presentation)	Clinical Trial Designs for Personalizing Digital Interventions
August, 2020	Numerical Analysis for Data Science Opening Workshop SAMSI (Virtual Presentation)	Intelligent Pooling for Thompson Sampling With Applications to Mobile Health
June, 2020	41st Annual Meeting: Society for Behavioral Medicine, Presidential Symposium: From	Optimizing Behavioral Mobile Health Interventions:

	Ideas to Interventions: A Review of Frameworks for Designing and Optimizing Health-Related Behavior (virtual)	Micro-Randomized Trials (joint with Tianchen Qian)
April, 2020	ICLR workshop, ML-IRL: Machine Learning in Real Life Virtual (Ethiopia)	Challenges in Developing Learning Algorithms to Personalize Treatment in Real Time
Jan, 2020	Keynote, 13th International Conference on Health Policy Statistics San Diego	Online Experimentation and Learning Algorithms in a Clinical Trial
<u>Invited Seminars Since 2020</u>		
Dec, 2023	Dept Biostatistics Brown University	Assessing Personalization In Digital Health
Oct, 2023	Distinguished Lecture Series UMass Amherst Manning College of Information and Computer Sciences	We used Reinforcement Learning: but did it work?
Oct, 2023	Amazon Supply Chain Optimization Technologies (SCOT) Science Seminar Series	Dyadic RL
March, 2023	Woodroffe Lecture Univ Michigan	Inference for Longitudinal Data After Adaptive Sampling
March, 2023	Two-Sigma New York (virtual)	We used Reinforcement Learning; but did it work?
March, 2023	Biostatistics Harvard Univ	Inference for Longitudinal Data After Adaptive Sampling
Dec, 2022	IOE-MIDAS Data Science and AI Colloquium Univ Michigan	Inference for Longitudinal Data After Adaptive Sampling
Dec, 2022	Radcliffe Institute Harvard University	Algorithms for Personalizing Digital Interventions
Dec, 2022	Distinguished Speaker Seminar Series MITs Institute for Data Systems and Society	Inference for Longitudinal Data After Adaptive Sampling
Nov, 2022	van Wijngaarden Lecture Centrum Wiskunde & Informatica Amsterdam	Personalization via Reinforcement Learning in Digital Health
Oct, 2022	Al-Kindi Lecture 1 KAUST, Saudi Arabia	We used Reinforcement Learning; but did it work?
Oct, 2022	Al-Kindi Lecture 2 KAUST, Saudi Arabia	Inference for Longitudinal Data After Adaptive Sampling
Oct, 2022	Quantitative Science Grand Rounds Moffitt Cancer Center	Data, Personalization, Digital Health!
Sept, 2022	Jon A. Wellner Lecture University of Idaho	Inference for Longitudinal Data After Adaptive Sampling
May, 2022	ORFE Princeton University	Inference for Longitudinal Data After Adaptive Sampling

May, 2022	Wilks Lecture Princeton University	Assessing Personalization In Digital Health
May, 2022	Odoroff Lecture University of Rochester	Assessing Personalization In Digital Health
May, 2022	ECNP "Get Digital" (Virtual) <a href="https://www.ecnp.eu/">https://www.ecnp.eu/</a>	Optimizing your digital health JITAI using a Micro-Randomized Trial
Jan., 2022	Chalmers AI Talks (Virtual), Sweden	We used Reinforcement Learning; but did it work?
Dec., 2021	EPFL Center for Intelligent Systems, Lausanne, Switzerland	We used Reinforcement Learning; but did it work?
Dec., 2021	H.O. Hartley Lecture Statistics Dept., Texas A&M	Assessing Personalization in Digital Health
Dec., 2021	Research Center for Child Well-Being Univ South Carolina	Data, Personalization, Digital Health!
Nov., 2021	IACS SEAS, Harvard Univ.	We used RL; but did it work?
Nov., 2021	Ninth Makuch Distinguished Lecture, UConn	Inference Using Adaptively Collected Data
Nov., 2021	Technology and Operations Management Unit, Harvard Business School	We used RL; but did it work?
Sept, 2021	Grand Rounds at the Herbert Wertheim School of Public Health and Human Longevity Science, UCSD	Assessing Personalization in Digital Health
Sept, 2021	Research Methods, Measurement, & Evaluation Program, UConn	Assessing Personalization in Digital Health
Sept, 2021	Departments of Statistical Science & Biostatistics and Bioinformatics Duke University	Assessing Personalization in Digital Health
June, 2021	Distinguished Speaker Seminar Department of Statistics, University of Oxford	Assessing Personalization in Digital Health
June, 2021	Artificial Intelligence Student Society (AISS), University of Pretoria, South Africa	We used a Bandit Algorithm to Personalize but..... Did it work?!
May, 2021	CSAIL-MSR Trustworthy and Robust AI Colloquium MIT, MSR	Learning both within and between trials involving sequential decision making
May, 2021	Stanford Biomedical Data Science Seminar	We used RL but..... Did it work?!
May, 2021	MIT Operations Research	We used RL but..... Did it work?!
Feb., 2021	SESSTIM Facult des Sciences Medicales et	Data, Personalization, Digital Health!

	Paramdicales et Paramdicales, Marseille, France	
Jan., 2021	Univ of Alabama, Nutrition Obesity Research Center	Data, Personalization, Digital Health!
Dec., 2020	Univ of Colorado, Dept of Statistics Boulder, CO	Challenges in Developing Learning Algorithms to Personalize Treatment in Real Time
Dec., 2020	Univ of Alabama, Dept of Biostatistics	Challenges in Developing Learning Algorithms to Personalize Treatment in Real Time
Nov., 2020	UCLA, Dept of Statistics	Challenges in Developing Learning Algorithms to Personalize Treatment in Real Time
Nov., 2020	Yale, Center for Biomedical Data Science	Challenges in Developing Learning Algorithms to Personalize Treatment in Real Time
Oct., 2020	Neyman Statistics Seminar Berkeley Statistics Dept	Challenges in Developing Learning Algorithms to Personalize Treatment in Real Time
Oct, 2020	Archimedians University of Cambridge UG Mathematical Society	Data, Personalization, Digital Health!
Oct, 2020	Harvard Science Research Conference for HS Students	Data, Personalization, Digital Health!
Oct, 2020	Harvard Science Research Conference for HS Students	Data, Personalization, Digital Health!
May, 2020	Online Causal Inference Seminar <a href="https://sites.google.com/view/ocis/home">https://sites.google.com/view/ocis/home</a>	Inference for Batched Bandits
Feb, 2020	Department of Biostatistics Columbia University	Challenges in Developing Learning Algorithms to Personalize Treatment in Real Time
Jan, 2020	UCSD Public Health Grand Rounds UCSD	Personalized HeartSteps: A mHealth RL Algorithm for Optimizing Physical Activity
Jan, 2020	Biostatistics and Bioinformatics Division UCSD	Time-Varying Causal Excursion Effects in Mobile Health with Binary Outcomes

#### Webinars and Workshops Since 2015

Oct., 2023	Addiction Health Services Research Conference	Optimizing second-generation JITAIs: Online algorithms
Oct., 2023	JAMA Summit on “Is the Clinical Trials Enterprise Broken and How Can It Be Fixed?”	Why Randomization?
July, 2023	Taught the First Half of the StatML Summer School in Causality, Reinforcement	

	Learning and Statistical Learning ( <a href="https://statml.io/index.php/statml-cdt-summer-school-july-2023/">https://statml.io/index.php/statml-cdt-summer-school-july-2023/</a> ), Missenden Abbey, UK
April, 2023	Innovations in JITAI development for cancer control: The Sense2stop study Educational Session at American Association for Cancer Research Annual Meeting
Oct., 2021	2020-21 Summer Institute: Building Just-in-Time Adaptive Interventions Two-day virtual workshop for Behavioral Health Scientists
Oct., 2021	Methods for Adapting and Personalizing      Continual Optimization and Prevention, Treatment, and Recovery      Personalization of Just-in-Time Services for SUD at the      Adaptive Interventions Addiction Health Services Research Conference
Sept., 2021	Micro-Randomized Trials & Online Decision Making Algorithms ASA Regulatory Industry Statistics Workshop
Jan, 2021	Challenges in Developing Online Learning and Experimentation Algorithms in Mobile Health AI4HealthWinterSchool: Transforming healthcare with Artificial Intelligence
2019	Optimizing Just-In-Time Adaptive Interventions for Mobile Health 2019 Research Society on Alcoholism Satellite Workshop
Sept, 2018	Analyzing Data from a Micro-randomized Trial, 1 & 1 Webinar sponsored by the Methodology Center, PSU
June, 2018	Micro-randomized Trials, 1 & 1 Webinar sponsored by the Methodology Center, PSU
May, 2018	Developing Just-in-time Adaptive Interventions Using Micro- randomized Trial Designs, M3 Pre-conference Workshop University of Connecticut
April, 2018	Workshop on Novel Experimental Approaches to Designing Effective Multi- Component Interventions, Society for Behavioral Medicine
March, 2018	Tutorial on Micro-randomized Trials for Constructing Mobile Health Interventions, ENAR
Jan, 2018	Webinar on Time-Varying Causal Treatment Effects, Prevention Science Methodology Group
May, 2017	Workshop on Novel Experimental Approaches to Designing Effective Multi- Component Interventions, Chicago Chapter of the ASA and Dept. of Preventive Medicine, Northwestern Univ.
May, 2016	Workshop on JITAI mobile intervention development Annual Meeting of the Association for Psychological Science, Chicago, IL, by Daniel Almirall, Inbal Nahum-Shani, Pedja Klasnja, Susan Murphy & Bonnie Spring
May, 2016	Introduction to JITAI: Just-in-Time Adaptive Interventions, Micro-Randomized Trials for Developing mHealth JITAI & Data Analytics for Developing JITAI Workshop at the Training on Optimization of Behavioral and Biobehavioral Interventions Washington, DC
March, 2016	Workshop on JITAI mobile intervention development Annual Meeting of Society of Behavioral Medicine, Washington, DC, by Daniel Almirall, Inbal Nahum-Shani, Pedja Klasnja, Susan Murphy & Bonnie Spring
May, 2016	Micro-Randomized Trials in Mobile Health,



	Webinar for Mathematica
April, 2016	Micro-Randomized Trials in Mobile Health, Webinar for Google, Ann Arbor
March, 2016	Building Just-In-Time Adaptive Interventions in Mobile Health: The Role of Micro-Randomized Trials Workshop at the Society of Behavioral Medicine Annual Meeting
March, 2016	Micro-Randomized Designs for Research Using mHealth Technologies, Webinar for the NIDA Clinical Trials Network
Dec., 2015	Micro-randomized Trials in mHealth Big Data Workshop at American Academy of Addiction Psychiatry
August 2015	Clinical Trial Methodology: Micro-randomized Trials & Primary Group Mentor mHealth 2015 Summer Training Institute, UCLA