

Keith J. Yoder

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SUMMARY

Data scientist with over 14 years of experience applying statistical modeling and machine learning to complex problems in neuroscience, psychology, and medical diagnostics. Dedicated to cross-functional collaboration aimed at leveraging technology to develop cutting-edge models that facilitate clinical care.

EXPERIENCE

2023-24 **Science Manager**

SPARK Neuro Inc., New York, NY

- Formalized scientific collateral procedures, reducing time to complete by 25%
- Supervised refactoring from 22 repos to 1 monorepo, reducing release time by 85%
- Adopted and maintained Agile planning, improving work completion rate by 45%

2022-23 **Senior Data Scientist**

SPARK Neuro Inc., New York, NY

- Built ETL pipelines to onboard and standardize 282 external EEG datasets
- Integrated data from multiple amplifiers, improving model accuracy by 5%
- Demonstrated utility of fractal distributions in distinguishing causes of dementia.

2021-22 **Senior Research Analyst**

Department of Psychology, University of Chicago, Chicago, IL

- Identified 5% decrease in accuracy for SVM in women compared to men
- Reduced feature extraction time by 70% by replacing Morlet wavelets with FFT
- Trained 10 team members to use ICA to clean blink and ECG artifacts from EEG data

EDUCATION

2017 Ph.D. in Psychology, University of Chicago
Concentration: Integrative Neuroscience
Thesis: "The neuroscience of justice sensitivity"

2014 M.A. in Psychology, University of Chicago
Thesis: "The neuroscience of moral judgment"

2011 M.A. in Social Science, University of Chicago
Thesis: "Individual differences and the moral-conventional distinction"

2009 B.S. in Human Development, Cornell University
Concentration: Biology and Human Development

GRANTS

- 2015-16 University of Chicago Division of Social Sciences Research Grant (\$19,680)
- 2013-16 University of Chicago Psychology Graduate Student Organization Travel Award (given yearly)
- 2013-16 University of Chicago Psychology Graduate Student Organization Research Grant (given yearly)

FELLOWSHIPS AND AWARDS

- 2017 Kavli Summer Institute in Cognitive Neuroscience Fellowship
- 2013-16 Joseph G. Dawson Jr. Fellowship Fund (Named Departmental Award, yearly)
- 2014 UC-Davis ERP Bootcamp Fellowship
- 2012 EGI Summer School for Advanced dEEG Analysis Techniques Fellowship

PUBLICATIONS

1. **Yoder, K.J.**, & Decety, J. (2022). Moral conviction and metacognitive ability shape multiple stages of information processing. *Cortex*, *151*. 162-175. doi: <https://doi.org/10.1016/j.cortex.2022.03.008>.
2. **Yoder, K.J.**, Harenski, C.L., Kiehl, K.A., & Decety, J. (2022). Psychopathic traits modulate functional connectivity during pain perception and perspective-taking in female inmates. *NeuroImage: Clinical*, *34*, 102984. doi: 10.1016/j.nicl.2022.102984.
3. **Yoder, K.J.**, Harenski, C., Kiehl, K.A., & Decety, J. (2021). Neural responses to morally laden interactions in female inmates with psychopathy. *NeuroImage: Clinical*, *30*. doi:10.1016/j.nicl.2021.102645.
4. **Yoder, K.J.**, Ruby, K., Pape, R., & Decety, J. (2020). EEG distinguishes heroic narratives in ISIS online video propaganda. *Scientific Reports*, *10*(1). 1-8. doi: 10.1038/s41598-020-76711-0.
5. Workman, C.I., **Yoder, K.J.**, & Decety, J. (2020). The dark side of morality: How moral convictions facilitate support for political violence. *AJOB Neuroscience*. Preprint: 10.31234/osf.io/t69w4.
6. **Yoder, K.J.** & Decety, J. (2020). Me first: Neural representations of fairness during a three-party economic game. *Neuropsychologia*. *147*. doi: 10.1016/j.neuropsychologia.2020.107576
7. **Yoder, K.J.** & Decety, J. (2019). Conflicting influences of justice perspectives on moral judgments. *Cognition & Emotion*. doi: 10.1080/02699931.2019.1669536
8. **Yoder, K.J.** & Decety, J. (2018). The neuroscience of morality and social decision-making. *Psychology, Crime & Law*, *24*(3), 279-295. doi: 10.1080/1068316X.2017.1414817
9. Decety, J. & **Yoder, K.J.** (2017). The emerging social neuroscience of justice motivation. *Trends in Cognitive Sciences*, *21*(1), 6-14. doi: 10.1016/j.tics.2016.10.008
10. **Yoder, K.J.**, Lahey, B.B., & Decety, J. (2016). Callous traits in children with and without conduct problems predict increased amygdala activity and reduced connectivity when viewing others' harm. *Scientific Reports*, *6*, 20216. doi: 10.1038/srep20216

11. Decety, J. & **Yoder, K.J.** (2016). Empathy and motivation for justice: Cognitive empathy and concern, but not emotional empathy, predict sensitivity to injustice for others. *Social Neuroscience*, 11(1), 1-14. doi: 10.1080/17470919.2015.1029593
12. Decety, J., **Yoder, K.J.**, & Lahey, B. (2015). Sex differences in abnormal white matter development associated with conduct disorder in children. *Psychiatry Research: Neuroimaging*, 233(2), 269-277. doi: 10.1016/j.psychresns.2015.07.009
13. **Yoder, K.J.**, Harenski, C., Kiehl, K.A., & Decety, J. (2015). Neural networks underlying implicit and explicit moral evaluations in psychopathy. *Translational Psychiatry*, 5, e625. doi: 10.1038/tp.2015.117
14. **Yoder, K.J.**, Porges, E.C., & Decety, J. (2015). Amygdala subnuclei connectivity in response to violence reveals unique influences of individual differences in psychopathic traits in a non-forensic sample. *Human Brain Mapping*, 36, 1417-1428. doi: 10.1002/hbm.22712
15. **Yoder, K.J.** & Decety, J. (2014). Spatiotemporal neural dynamics of moral judgment: A high-density ERP study. *Neuropsychologia*, 60, 39-45. doi:10.1016/j.neuropsychologia.2014.05.022
16. **Yoder, K.J.** & Decety, J. (2014). The good, the bad, and the just: Justice sensitivity predicts neural response during moral evaluation of actions performed by others. *Journal of Neuroscience*, 34(12), 4161-4166. doi:10.1523/JNEUROSCI.4648-13.2014
17. Kheirandish-Gozal, L., **Yoder, K.**, Kulkarni, R.S., Gozal, D., & Decety, J. (2014). Preliminary functional MRI neural correlates of executive functioning and empathy in children with obstructive sleep apnea. *Sleep*, 37(3):587-592. doi: 10.5665/sleep.3504
18. Decety, J., Skelly, L., **Yoder, K.J.**, & Kiehl, K. (2013). Neural processing of dynamic emotional facial expressions in psychopaths. *Social Neuroscience*, 9(1), 36-49. doi: 10.1080/17470919.2013.866905
19. Chen, G.M., **Yoder, K.J.**, Ganzel, B.L., Goodwin, M.S., & Belmonte, M.K. (2012). Harnessing repetitive behaviours to engage attention and learning in a novel therapy for autism: An exploratory analysis. *Frontiers in Educational Psychology*, 3(12). doi: 10.3389/fpsyg.2012.00012
20. Valla, J.M., Ganzel, B.L., **Yoder, K.J.** Chen, G.M., Lyman, L.T., Sidari, A.P., Keller, A.E., Maendel, J.W., Perlman, J.E., Wong, S.K.L., & Belmonte, M.K. (2010). More than maths and mindreading: Sex differences in empathising/systemising covariance. *Autism Research*, 3(4):174-184. doi: 10.1002/aur.143
21. **Yoder, K.J.** & Belmonte, M.K. (2010). Combining computer game-based behavioural experiments with high-density EEG and infrared gaze tracking. *Journal of Visualized Experimentation*, 16(46), pii: 2320. doi: 10.3791/2320

CHAPTERS

22. **Yoder, K.J.** & Belmonte, M.K. (2011). Information Processing and Integration. In: D.G. Amaral, G. Dawson & D.H. Geschwind (eds.), *Autism Spectrum Disorders* (pp. 1010-1027). New York: Oxford University Press.

UNDER REVIEW/IN REVISION

23. **Yoder, K.J.**, Brookshire, G., Glatt, R., Merrill, D.A., Gerrol, S., Quirk, C., & Lucero, C, (*under revision*). Fractal dimension distributions of resting-state EEG improve detection of dementia and Alzheimer's disease compared to traditional fractal analysis. *Scientific Reports*

24. Brookshire, G., Kasper, J., Blauch, N., Wu, Y., Glatt, R., Merrill, D.A., Gerrol, S., **Yoder, K.J.**, Quirk, C. & Lucero, C. (medRxiv - 2024). Data leakage in deep learning studies of translational EEG *Under Revision at Frontiers in Neuroscience*

PRE-PRINTS

25. Pape, R., Decety, J., Ruby, K., **Yoder, K.J.**, & Rovang, D. (2023). Identity and narrative persuasion: How ISIS Western-directed propaganda works. *Pre-print at APSA Preprints*

POPULAR PRESS

Yoder, K.J., & Decety, J. (17 March 2021) Selfish or selfless? Human nature means you're both. *The Conversation*

CONFERENCE PRESENTATIONS

Yoder, K.J., Brookshire, G., Gerrol, S., Quirk, C., & Lucero, C (2023). Differential diagnosis of Lewy body dementias using multivariate EEG classifiers. Poster presented at the annual meeting for the Alzheimer's Association International Conference, Amsterdam, Netherlands.

Yoder, K.J., Brookshire, G., Gerrol, S., Quirk, C., & Lucero, C (2023). Identifying and differentiating dementias with EEG fractal dimension distributions. Poster presented at the annual meeting for the Alzheimer's Association International Conference, Amsterdam, Netherlands.

Ye, K.J., Samek, A., **Yoder, K.J.**, Decety, J., Hortacsu, A. & List, J.A. (2019). Using EEG to evaluate an early childhood intervention. Poster presented at the annual meeting for the Society for Neuroeconomics, Dublin, Ireland.

Yoder, K.J. & Decety, J. (2019). Political moralization enhances ERPs to social information and decreases social conformity. Poster presented at the annual meeting for the Society for Social Neuroscience, Chicago, IL.

Workman, C.I., **Yoder, K.J.** & Decety, J. (2018). Feel the spurn: An fMRI study of political polarization and support for violence. Poster presented at the annual meeting for the Society for Social Neuroscience, San Diego, CA.

Yoder, K.J. & Decety, J. (2018). Decoding neural computations of fairness in three-party distributions. Poster presented at the annual meeting for the Society for Social Neuroscience, San Diego, CA.

Yoder, K.J. & Decety, J. (2017). How fairness dispositions impact spatiotemporal neural dynamics in a three-party distribution game. Poster presented at the annual meeting for the Society for Social Neuroscience, Washington, DC.

Yoder, K.J. & Decety, J. (2016). Justice sensitivity impacts neural activity during a three-party distribution game. Poster presented at the annual meeting for the Society for Social Neuroscience, San Diego, CA.

Yoder, K.J. & Decety, J. (2015). Functional connectivity reveals network abnormalities during explicit and implicit moral reasoning in psychopathy. Poster presented at the annual meeting of the Society for Neuroscience, Chicago, IL

Yoder, K.J. & Decety, J. (2015). Functional connectivity reveals network abnormalities during explicit and implicit moral reasoning in psychopathy. Poster presented at the annual meeting of the Society for Social Neuroscience, Chicago, IL
People's Choice Poster Award 3rd Place

Yoder, K.J. & Decety, J. (2014). The relationship between motivation for justice, empathy, and psychopathy. Poster presented at annual meeting of the Society for Social Neuroscience, Washington, DC.

Yoder, K.J. & Decety, J. (2014). Cognitive empathy predicts enhanced ERP encoding of moral valence. Poster presented at annual meeting of Midwest Psychological Association, Chicago, IL.

Yoder, K.J. & Decety, J. (2013). Justice sensitivity predicts prefrontal recruitment during moral decision-making. Poster presented at annual meeting of the Society for Social Neuroscience, San Diego, CA.

Yoder, K.J. & Decety, J. (2013). Justice sensitivity predicts prefrontal recruitment during moral decision-making. Poster presented at annual meeting of the Society for Neuroscience, San Diego, CA.

Kheirandish-Gozal, L., **Yoder, K.**, Kulkarni, R.S., Decety, J., & Gozal, D. (2013). Children with obstructive sleep apnea exhibit altered neural processing during executive or empathy-related tasks. Poster presented at annual meeting of American Thoracic Society International Conference, Philadelphia, PA.

Tong, L. C., **Yoder, K. J.**, & Decety, J. (2013). Vagal reactivity predicts moral judgment of ambiguous actions. Poster session presented at the 85th meeting of the Midwestern Psychological Association.

Tong, L. C., **Yoder, K. J.**, Porges, E. C., & Decety, J. (2013). Anxiety moderates the relationship between parasympathetic tone and moral judgment of ambiguous actions. Poster session presented at the 9th Annual Chicago Area Undergraduate Research Symposium, Chicago, IL.

Yoder, K.J., Porges, E.C., & Decety, J. (2012). Amygdala subnuclei-seeded functional connectivity: a novel application of probabilistic tractography. Poster at the annual meeting of Cognitive Neuroscience Society, Chicago, IL.

Yoder, K.J. & Belmonte, M.K. (2011). EEG measures of social and non-social autistic traits within and beyond the autism spectrum. Poster session presented at the annual International Meeting for Autism Research, San Diego, CA.

Yoder, K.J. & Belmonte, M.K. (2010). EEG indices of correlated social and non-social information processing in autism. Poster at the annual meeting of the *Society for Neuroscience*, San Diego, CA.

Chen, G.M., **Yoder, K.J.**, Ganzel, B.L., Goodwin, M.S., & Belmonte, M.K. (2008). Efficacy of a prompted-pointing therapy in improving learning behaviour in non-speaking children with autism. Poster session presented at the annual International Meeting for Autism Research, Chicago, IL.

PATENTS

Lucero, C., Brookshire, G., **Yoder, K.J.**, Wu, Y., Quirk, C., & Gerrol, S. (2023). Methods and systems for detecting and assessing cognitive impairment.

TEACHING EXPERIENCE

University of Chicago

2016 TA, Experimental Design 1 and Experimental Design 2. Instructor: Steve Shevell
Gave weekly lectures demonstrating statistical analysis in R, including t-tests, mixed-effects ANOVA, permutation tests, and bootstrapping, helped students develop analysis strategies for research projects and troubleshoot R code, graded homework assignments, wrote exam questions, graded exams.

2015 TA, Psychology Research Methods. Instructor: Anne Henly
Held weekly discussion sections, helped students design group research projects, met weekly with students to answer statistical analysis questions, wrote exam questions, graded exams. Gave lecture "Understanding Mind using Brain"

2015 TA, Psychological Statistics. Instructor: William Goldstein
Held weekly teaching sections, developed review materials, graded assignments.

2014 TA, Sensation and Perception. Instructor: Steve Shevell
Held review sections, wrote exam questions, graded exams. Gave lectures "Motion" and "Touch and Pain."

Cornell University

2010 TA, Autism and the Development of Social Cognition. Instructor: Matthew Belmonte
Developed tutorials for analysis of EEG data using EEGLAB: referencing, filtering, artifact detection, analyzing event-related potentials and spectral perturbations

SERVICE

2021- ReproducibiliTea, Member

2016- MR Users' Group, Member

2013-14 Psychology Graduate Student Organization, Treasurer

2012-16 Psychology Graduate Student Organization, Travel & Research Committee, Member

PROFESSIONAL MEMBERSHIPS

International Society to Advance Alzheimer's Research and Treatment, Association for Psychological Science, Cognitive Neuroscience Society, International Society for Autism Research, International Society for Justice Research, Midwest Psychological Association, Society for Neuroscience, Society for Social Neuroscience

AD HOC REVIEWING

Biological Psychology, Brain Research, British Journal of Developmental Psychology, Child Development, Cognitive, Affective & Behavioral Neuroscience, Journal of Abnormal Child Psychology, Journal of Neuroscience Research, Scientific Reports, Social Neuroscience, Social Cognitive and Affective Neuroscience, NeuroImage, NeuroImage: Clinical, Neuropsychologia, Psychiatry Research: Neuroimaging, Psychology Research and Behavior Management, Psychophysiology