Robin Sifre

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RESEARCH INTERESTS

Early attention and brain development; autism spectrum disorders. My research leverages eye-tracking data to develop metrics of social attention and developmental risk factors. I study attention using multi-level methods (MRI, eye-tracking, survey data) with a developmental lens.
I also work as a Data Scientist for the TransYouth Project in the Human Diversity Lab.

EDUCATION AND TRAINING

- **University of Minnesota Twin Cities,** Ph.D. Candidate, September 2016 - May 2021
  Developmental Psychology; Advisors: Jed Elison and Dan Berry
- **Brown University,** B.S. Cognitive Neuroscience, May 2014
  Cognitive neuroscience; Advisors: Fiery Cushman and Dima Amso

RESEARCH & DATA SCIENCE EXPERIENCE

Princeton University, Psychology, Data Scientist & Statistician, Dec 2020 – present

- Designed logical and clear data organizational structure for 20-year-long study that included in-person behavioral data and online survey data.
- Worked as statistical consultant to conceptualize and execute analyses aimed at understanding how socially transitioning impacts mental health in gender-nonconforming youth (manuscript in prep).
- Harmonized six years of online survey data in R.

EarliTec Diagnostics, Data Science Consultant, Jan 2021 – present

- Work with engineers to develop a product that uses eye-tracking data to diagnose infants with autism spectrum disorders.
- Develop and document pipeline with high-level flow charts and function descriptions to present to external team.

University of Minnesota, Ph.D. Candidate, Sep 2016 – May 2021

Adjusting for measurement bias in survey data

- Statistically adjusted for measurement bias in data from parents reporting on their children's behaviors.
- Used adjusted metrics in longitudinal multi-level mixed effects models of behavioral development.
- Applied this technique to data from the Family Life Project to develop longitudinally invariant environmental measures of poverty-related adversity and resources.

Attention development in infants

- Created eye-tracking processing pipeline for researchers.
- Leveraged methods from Complexity Science to quantify system dynamics in eye-tracking time series. Published results indicating that these metrics predicted when infants attended to social information.
- Established best practices for eye-tracking data management and supervised RAs to organize the lab's eye-tracking data.

FELLOWSHIPS, AWARDS, AND HONORS

University of Minnesota Doctoral Dissertation Fellowship, 2020-2021

National Science Foundation Graduate Student Research Fellowship, 2017-2020

University of Minnesota Autism Initiative Trainee Travel Award, 2019

Graduate Student Professional Development Grant, 2018

Graduate Students of Education and Human Development Travel Grant, 2017

College of Education and Human Development Graduate Student Fellowship, 2016

Rhodes Scholarship, Finalist, 2015

Donald J. Cohen Fellowship in Developmental Social Neuroscience, 2014-2016

Head Writing Fellow at Brown University, 2013-2014

SKILLS

- **Statistics:** Longitudinal data analysis (multi-level modeling, measurement invariance), methods for handling missing data (multiple imputation), factor analysis, time series analysis, causal inference (regression adjustment, inverse propensity weighting), data mining, machine learning.
- **Software:** R, RMarkdown, Python, Mplus, and MATLAB; Intermediate Java. Comfortable with bash scripting and SQL.
- **Eye tracking:** Developing processing pipelines, developing and evaluating metrics, data collection and organization.
- **Other:** Data visualization (ggplot2), data wrangling (tidyverse), experimental design, survey design, psychometrics, writing and communication.

PUBLICATIONS

*Denotes equal first-author contributions.

Sifre, R., Berry, D., Wolff, J., & Elison, J.T. (2021). Longitudinal change in restrictive and repetitive behaviors from 8-36 months. *Journal of Neurodevelopmental Disorders.*

Dejoseph, M., **Sifre, R.,** Raver, C., Blair, C., & Berry, D. (2021). Capturing environmental dimensions of adversity and resources in the context of poverty across infancy through early adolescence: A moderated nonlinear factor model. *Child Development.*

Stallworthy, I.*, **Sifre, R.*,** Berry, D.*, Lasch, C., Smith, T., Berry, D., & Elison, J.T. (2020). The fractal organization of infants' gaze while viewing dynamic stimuli. *Scientific Reports.*

Sifre, R., Piven, J., & Elison, J.T. (2020). Brain and Behavioral Development in High-Risk Infants: Considering the Role of Sensorimotor, Attentional and Reward Networks. *Advances in Research on Infants with Autism Spectrum Disorder* (Eds. F. Volkmar & K. Chawarska).

Sifre, R., Olson, L., Klin, A., Jones, W., Gillespie, S., & Shultz, S. (2018). A Longitudinal Investigation of Preferential Attention to Biological Motion in 2 to 24 Month-Old Infants. *Scientific Reports.*

Sifre, R., Lasch, C., Fenoglio, A., Georgieff, M.K., Wolff, J.J., & Elison, J.T. (2018). Restricted and Repetitive Behaviors and Social Reciprocity in Toddlers Born Preterm. *Journal of Pediatrics.*

Manuscripts in preparation

Sifre, R., Kelty-Stephen, D., Stallworthy, I., Berry, D., & Elison, J.T. (in prep). Cross-scale interactivity in infants' eye-gaze constrains looking behavior over developmental time.

Dejoseph, M., Herzberg, M., **Sifre, R.,** Berry, D., & Thomas, K.M. (in prep). Measurement matters: An individual differences examination of family socioeconomic status, latent dimensions of children's environments, and resting state functional brain connectivity in the ABCD sample.

SELECTED CONFERENCE PRESENTATIONS

Palmer, A., Leneman, K., DeJoseph, M., **Sifre, R.**, Blair, C., Berry, D. (2021). An aMNLFA Approach to Measurement Invariance of the Strength and Difficulties Questionnaire. Poster presentation at SRCD.

DeJoseph, M.L., **Sifre, R.,** Herzberg, M., Raver, C.C., Blair, C.B., Thomas, K.M., & Berry, D. (September 2020). Measurement matters: A method for capturing socioculturally- and developmentally-valid measures of children's early environments in high-dimensional datasets. Poster presentation at FLUX.

Sifre, R., Stallworthy, I., Lasch, C., Smith, T., Berry, D.. & Elison, J.T. (May 2019). The fractal structure of gaze patterns for young children, and its relationship to visual social engagement. Poster presentation at the International Meeting for Autism Research: Montreal, Canada.

Sifre, R., Lasch, C., Wolff, J.J., & Elison, J.T. (May 2017): Characterizing normative longitudinal trajectories of restricted and repetitive behaviors in infants, toddlers, and preschoolers. Poster presentation at International Congress on Infant Studies: Philadelphia, PA.

Sifre, R., Olson, L., Jones, W., Klin, A., & Shultz, S. (May, 2016). The development of preferential attention to biological motion in 2- to 24-month-old infants. Poster presentation at the International Congress on Infant Studies: New Orleans, LA.

Sifre, R., Jones, W., Klin, A., & Shultz, S. (May, 2016). Orienting response to social versus physical audiovisual synchrony does not differ in toddlers with ASD. Poster submission at the International Meeting For Autism Research: Baltimore, MD.

INVITED TALKS & GUEST LECTURES

Sifre, R. & Stallworthy, I. (2019, March). Complexity science and infants' attention: Applying fractal analyses to gaze data. Institute of Child Development Bag Lunch Series.

Sifre R. (2021, April). Gender development in gender-nonconforming youth. Guest lecturer in Intro to Child Development, Institute of Child Development.

LEADERSHIP & TEACHING

Graduate Student Representative, University of Minnesota, September 2019-May 2020

- Held focus groups to gather information about perceived strengths and weaknesses of graduate training.
- Distilled feedback into list of priority action items to present to leadership.

Course Instructor, University of Minnesota, January 2019-May 2019

- Taught Intro to Child Psychology. Developed curriculum, lectures, and test materials.

REFERENCES

Jed Elison, Ph.D.
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