URSULA A. TOOLEY

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EDUCATION

University of Pennsylvania *Sept 2016-Present*
Ph.D., Neuroscience
(Advisors: Drs. Allyson Mackey & Danielle Bassett)

University of Arizona *2014*
B.S., Neuroscience, Minors in Mathematics and Chinese Language
Summa Cum Laude, Phi Beta Kappa Society, Nu Rho Psi
Honors Thesis: *Longitudinal Analysis of Sleep Disruption in Pediatric Subjects with Down Syndrome*
(Advisor: Dr. Jamie Edgin)
Graduate courses: Seminal Readings in Educational Psychology, Seminar on Translational Neuroscience, fMRI Methods

Beijing Institute of Education *2011*
Beijing, China
Certificate in Chinese Language

FELLOWSHIPS, GRANTS, & AWARDS

Neurohackademy Fellow *2020 (postponed to 2021)*
eScience Institute, University of Washington
Summer Institute in Cognitive Neuroscience Fellow *2019*
Kavli Summer Institute, UC-Santa Barbara
Graduate Student Travel Award *2017, 2018, 2019*
Biomedical Graduate Studies, University of Pennsylvania
NSF Graduate Student Research Fellowship *2016*
National Science Foundation
Excellence in Undergraduate Research Award *2014*
University of Arizona Department of Neuroscience
Honors Alumni Legacy Grant *2013*
University of Arizona Honors College
Summer Internship Grant *2013*
University of Arizona Honors College
First Level Honors *2013*
University of Arizona Honors College
Undergraduate Biology Research Program Fellow *2012*
University of Arizona
Boren Award, Alternate *2011*
National Security Education Program, USA
Study Abroad Award *2011*
University of Arizona Honors College
Sophomore Honorary *2011*
University of Arizona Honors College

PUBLICATIONS

Tooley, U.A., Bassett, D.S. & Mackey, A.P. (2022). Functional brain network communities in childhood: Unfinished territories and fuzzy boundaries. *Neuroimage*, 118843. doi.org/10.1016/j.neuroimage.2021.118843

Mahadevan, A.S., **Tooley, U.A.**, Bertolero, M.A., Mackey A.P., & Bassett, D.S. (2021). Evaluating the sensitivity of functional connectivity measures to motion artifact in resting-state fMRI data. *Neuroimage*, 118408. doi.org/10.1016/j.neuroimage.2021.118408

McDermott, C.L., Hilton, K., Park, A.T., **Tooley, U.A.**, Boroshok, A.L., Mupparapu, M., Scott, A.M., Bumann, E.E., Mackey, A.P. (2021). Early life stress is associated with earlier emergence of permanent molars. *Proceedings of the National Academy of Sciences*, 118(24) e2105304118. doi.org/10.1073/pnas.2105304118

Cieslak, M., Cook, P.A., He, X., Yeh, F.H., Dhollander, T., Adebimpe, A. ... **Tooley, U. A.** ... & Satterthwaite, T.D. (2021). QSIPrep: A robust and unified workflow for preprocessing and reconstructing diffusion MRI. *Nature Methods*, 18, 775-778. doi.org/10.1038/s41592-021-01185-5

Tooley, U.A., Bassett, D.S. & Mackey, A.P. (2021). Environmental influences on the pace of brain development. *Nature Reviews Neuroscience*, 22, 372-384. doi.org/10.1038/s41583-021-00457-5.

Park, A. T., **Tooley, U. A.**, Leonard, J. A., Boroshok, A. L., McDermott, C.L., Tisdall, M.D., & Mackey, A.P. (2020). Early childhood stress is associated with blunted development of ventral tegmental area connectivity. *Developmental Cognitive Neuroscience*, 47:100909. doi:10.1016/j.dcn.2020.100909

Tooley, U. A., Mackey, A. P., Ciric, R., Ruparel, K., Moore, T. M., Gur, R. C., Gur, R. E., Satterthwaite, T. D., & Bassett, D. S. (2020). Associations between neighborhood SES and functional brain network development. *Cerebral Cortex*, 30(1), 1-19. doi:10.1093/cercor/bhz066

Tooley, U., Makhoul, Z., & Fisher, P.A. (2016). Nutritional status of foster children: Implications for cognitive and behavioral development. *Children and Youth Services Review*, 70, 369-374. doi:10.1016/j.childyouth.2016.10.027

Edgin, J.O, **Tooley, U.**, Demara, B., Nyhuis, C., Anand, P., & Spano, G. (2015). Sleep disturbance and expressive language development in preschool-age children. *Child Development*, 86(6), 1984-1998. doi:10.1111/cdev.12443

Submitted & In prep

Tooley, U.A., Park, A. T., Leonard, J. A., Boroshok, A. L., McDermott, C.L., Tisdall, M.D., Bassett, D.S., & Mackey, A.P. The age of reason: Functional brain network development during childhood. *In prep*.

Boroshok A.L., Park A.T., Fotiadis, P., Velasquez G.H., **Tooley, U.A.**, Simon K.R., Forde J.C.P., Tisdall M.D., Cooper E.A., & Mackey A.P. Individual differences in frontoparietal plasticity in humans. *Under review*. BioRxiv:preprint link

INVITED TALKS

Tooley, U.A., Bassett, D.S., & Mackey, A.P. *Functional brain network development: Morphing boundaries & environmental influences.* Baby Bees Laboratory Meeting, New York University. July 2021 (virtual).

Tooley, U.A., Bassett, D.S., & Mackey, A.P. *Associations between neighborhood SES and functional brain network development.* Cognitive Development and Neuroimaging Laboratory Meeting, Columbia University. January 2021 (virtual).

Tooley, U.A., Bassett, D.S., & Mackey, A.P. *Network learning in development.* Penn Computational Cognitive Neuroscience Lab, University of Pennsylvania. August 2020 (virtual).

Tooley, U.A., Bassett, D.S., & Mackey, A.P. *Functional brain network development in childhood and adolescence: Associations with SES.* Developmental Psychology Brownbag Seminar, Philadelphia, PA. November 2019.

Tooley, U.A. Mackey, A. P., Ciric, R., Ruparel, K., Moore, T. M., Gur, R. C., Gur, R. E., Satterthwaite, T. D., & Bassett, D. S. *Associations between neighborhood SES and functional brain network development*. Organization for Human Brain Mapping: Rome, Italy. June 2019.

Tooley, U.A., Bassett, D.S., & Mackey, A.P. *Functional parcellation of developmental brain networks.* International Research Training Group: Spring School, Philadelphia, PA. May 2019.

Tooley, U.A., Bassett, D. *Environmental influences on functional network topology across development.* Graduate Research in Progress Presentations, Philadelphia, PA. May 2018.

Tooley, U.A., Bassett, D. *Environmental influences on functional network topology across development.* International Research Training Group: Spring School, Aachen, Germany. April 2018.

Tooley, U.A., Mackey, A. *Socioeconomic status and early brain development.* International Research Training Group: Spring School, Philadelphia, PA. April 2017.

Tooley, U.A. *Actigraphic analysis of sleep disruption in pediatric subjects with Down syndrome: Effects on cognition.* Emory STEM Research and Career Symposium, Atlanta, GA. April 2013.

POSTER PRESENTATIONS

Christina A. Recto, **Ursula A. Tooley**, Danielle S. Bassett, Allyson P. Mackey. *Associations between age, socioeconomic status, and brain network connectivity in childhood*. Organization for Human Brain Mapping (virtual). June 2021.

Boroshok, A.L., Park, A.T., **Tooley, U.A.**, McDermott, C.L., Leonard, J.A., & Mackey, A.P. *Influences of childhood adversity and SES on pubertal hormones and mental health.* International Society for Psychobiology: Rockville, MD. October 2020.

McDermott, C.L, Hilton, K., Mupparapu, M., Boroshok, A.L., Park, A.T., **Tooley, U.A.**, Delgado Reyes, L., Leonard, J.L., Bumann, E.E., Scott, J.A., & Mackey, A.P. *Early life stress is associated with accelerated dental development.* International Society for Psychobiology: Rockville, MD. October 2020.

McDermott, C.L., Hilton, K., Mupparapu, M., Boroshok, A.L., Park, A.T., **Tooley, U. A.**, Delgado Reyes, L., Leonard, J. A., & Mackey, A.P. *Early life stress is associated with accelerated dental development*. Flux Congress. September 2020.

Park, A. T., Leonard, J. A., **Tooley, U. A.**, Richardson, H., Ke, A., Tisdall, M.D., Edgar, J.C., & Mackey, A.P. *Neural activation to naturalistic emotional events in young children.* Flux Congress. September 2020.

Boroshok, A.L., Park, A.T., **Tooley, U. A.**, McDermott, C.L., Delgado Reyes, L., Leonard, J. A., & Mackey, A.P. *Environmental influences on adrenarchal hormones.*. Flux Congress. September 2020.

Tooley, U. A., Bassett, D.S., & Mackey, A.P. *Functional network community structure in development*. Organization for Human Brain Mapping: Montreal, Canada. June 2020.

Mahadevan, A., **Tooley, U. A.**, Bertolero, M., Mackey, A.P., & Bassett, D.S. *Sensitivity of functional connectivity measures to motion artifact in resting-state fMRI data*. Organization for Human Brain Mapping: Montreal, Canada. June 2020.

Park, A. T., **Tooley, U. A.**, Boroshok, A. L., Leonard, J. A., & Mackey, A.P. *Early childhood stress is associated with blunted development of ventral tegmental area connectivity.* Organization for Human Brain Mapping: Montreal, Canada. June 2020.

Cieslak, M., Cook, P.A., Dhollander, T., Yeh, F.H., Garyfallidis, E., Elliott, M.A., Sydnor, V.J., **Tooley, U. A.** ... & Satterthwaite, T.D. *QSIPrep: A robust and unified workflow for preprocessing and reconstructing diffusion MRI*. Organization for Human Brain Mapping: Montreal, Canada. June 2020.

Tooley, U. A., Park, A.T., Leonard, J.A., Boroshok, A.L., Bassett, D.S., & Mackey, A.P. *Functional network development during early childhood*. Organization for Human Brain Mapping Equinox, Twitter conference. March 2020.

Tooley, U. A., Park, A.T., Leonard, J.A., Boroshok, A.L., Bassett, D.S., & Mackey, A.P. *Functional network development in early childhood*. Flux Congress: New York, NY. August 2019.

Park, A. T., Leonard, J. A., **Tooley, U. A.**, Boroshok, A. L., & Mackey, A. P. *Stress exposure in early childhood relates to altered midbrain functional connectivity*. Flux Congress: New York, NY. August 2019.

Boroshok, A.L., Velasquez, G.H., Park, A.T., Simon, K. R., Forde, J. C.P.,**Tooley, U. A.**, Wedderburn, Q. O., Leonard, J. A., Cooper, E. A., & Mackey, A.P. *Individual differences in frontoparietal plasticity*. Flux Congress: New York, NY. August 2019.

Leonard, J. A., Scorcher, L.K., Forde, J.C., Ferleger, S.R., **Tooley, U. A.**, Park, A. T., & Mackey, A. P. *Associations between brain development and creativity in early childhood*. Flux Congress: New York, NY. August 2019.

Tooley, U. A., Mackey, A. P., Ciric, R., Ruparel, K., Moore, T. M., Gur, R. C., Gur, R. E., Satterthwaite, T. D., & Bassett, D. S. *Associations between neighborhood SES and functional brain network development*.

Organization for Human Brain Mapping: Rome, Italy. June 2019.

Tooley, U.A. & Mackey, A.P. *Local functional connectivity development in early childhood: Associations with socioeconomic status.* Flux Satellite Conference: Chapel Hill, NC. May 2018.

Tooley, U.A & Mackey, A.P. *Local functional connectivity development in early childhood: Associations with socioeconomic status.* Cognitive Neuroscience Society: Boston, MA. March 2018.

Tooley, U., Kim, J.K., Bruce, J., & Fisher, P.A. *The Impact of Caregiver Behaviors on Cognitive Development in Preschool-Aged Foster Children.* Society for Research on Child Development, Austin, TX. April 2017.*

Beauchamp, K.G., Shaffer, K.A., **Tooley, U.**, & Berkman, E.T. *Context-specific inhibitory control training: Targeting a key neurocognitive skill to reduce risk-taking in adolescents.* Social and Affective Neuroscience Society, New York, NY. April 2016.

Tooley, U., Spano, G., Demara, B., Nyhuis, C., Anand, P., Stoops, C., & Edgin, J.O. *Sleep quality, language development, and autism symptoms in preschool-age children with Down syndrome.* Society for Research in Child Development, Philadelphia, PA. March 2015.

Tooley, U., & Edgin, J.O. *Longitudinal analysis of sleep disruption in pediatric subjects with Down syndrome: effects on language and executive function.*International Mind, Brain, and Education Society, Fort Worth, TX. November 2014.

Tooley, U. & Edgin, J.O. *Longitudinal analysis of sleep disruption in pediatric subjects with Down syndrome: effects on language and executive function.* Neuroscience Honors Forum, University of Arizona. May 2014.

Spano, G., Demara, B., **Tooley, U.**, Anand, P., & Edgin, J.O. *Sleep fragmentation and language in toddlers with Down syndrome.* Sleep 2014. Minneapolis, MN. May 2014.

Demara, B., Spano, G., **Tooley, U.**, Yamaguchi, L., & Edgin , J.O. *Sleep, slow wave fragmentation, and language in Down syndrome.* Society for Neuroscience, San Diego, CA. November 2013.

Edgin, J. O., Spano, G., Breslin, J., Bootzin, R. R., Chen, C. C., **Tooley, U.**, & Nadel, L. *Sleep and cognition in Down syndrome: a developmental perspective.* Cognition in Down syndrome: Molecular, Cellular and Behavioral Features and the Promise of Pharmacotherapeutics. April 2013.

Edgin, J.O., Breslin J., Spano, G., **Tooley, U.A.**, Bootzin, R.R., & Nadel L. *Sleep and learning in Down syndrome.* Society for Research in Child Development, Seattle, WA, April 2013.

Tooley, U. *Circadian rhythms, glycemic control, and physiological processes in aging subjects.* Eleanor Roosevelt Research Symposium, Greenbelt, MD, 2010-Poster

**presented in absentia*

PROFESSIONAL MEMBERSHIP

Organization for Human Brain Mapping (OHBM)	2018
Flux Society	2018
Cognitive Neuroscience Society (CNS)	2017
Society for Neuroscience (SfN)	2017
Society for Research in Child Development (SRCD)	2016

PEER REVIEW

Cerebral Cortex, Health and Place, Developmental Psychobiology, Biological Psychiatry: Global Open Science

OPEN SOURCE CONTRIBUTIONS

Esteban, O., Blair, R., Markiewicz, C. J., Berleant, S. L., Moodie, C., Ma, F., ... **Tooley, U.A.**, Poldrack, R.A., Gorgolewski, K. J. (2019). fMRIPrep: A robust preprocessing pipeline for functional MRI (Version 1.5.0). https://doi.org/10.5281/zenodo.3375521

Esteban, Oscar, Blair, Ross, Markiewicz, Christopher J., Berleant, Shoshana L., Poldrack, Russell A., & Gorgolewski, Krzysztof J.
Researchers: Lurie, Daniel J., Kent, James D., Ye, Zhifang, **Tooley, Ursula A.**, Goncalves, Mathias, Ghosh, Satrajit, Thompson, William H. (2019). NIWorkflows: NeuroImaging Workflows (Version 0.10.3). http://doi.org/10.5281/zenodo.3403256

Rastko Ciric, Azeez Adebimpe, Matt Cieslak, Adon Rosen, Theodore Satterthwaite, & **Ursula Tooley**. (2019). PennBBL/xcpEngine: version1.0 (Version v1.0). http://doi.org/10.5281/zenodo.2628819

niworkflows/fMRIPrep 1.4.1

- PR #365: New functionality clarifying qform and sform comparisons, tests to cover this functionality and other related code

fMRIPrep 20.0.2

- PR #2028: Documentation clarifying use of PyBIDS to filter input files

PROFESSIONAL SERVICE & OUTREACH

Member & Brain Awareness Week Apprentice; Graduate-Led Initiatives and Activities, University of Pennsylvania *2018-2020*
Organized outreach events for Brain Awareness Week in Philadelphia for over 100 participants, participated in outreach events for the general public, including the Neuroscience Public Lecture and Kids Judge events.

Writer; Brains in Brief, University of Pennsylvania *2018-2020*
Wrote and edited short, digestible summaries of recently published neuroscience research for the general public. Link to brief #1

Founder, Cognitive Neuroscience & NeuroImaging Journal Club; University of Pennsylvania *2017-2020*
Started a journal club for neuroscience graduate students focused on topics in cognitive neuroscience as well as modern cognitive neuroscience methods. Organized biweekly meetings and paper presentations.

High School Mentor & Member; University of Oregon Science Outreach Club, *2014-2016*
Developed curriculum for sessions focusing on human subjects research, lab protocols, females in science fields, career choices, and fMRI scanning. Met weekly with 8th grade student, assisted in completion of her project requirements, and conducted lab tours. Initiated and led school- and community-based outreach events for children aged 5-17, including class presentations, hands-on activities, camp modules, and tabling at community events.

TEACHING & MENTORSHIP

Senior Fellow; Center for Neuroscience & Society, University of Pennsylvania *2020-2021*
Instructor: Dr. Martha Farah
Prepared small group meetings focused on readings on implications of neuroscience for policy and ethics, mentored students on career choices, critical reading and writing, and poster presentation.

Teaching Assistant; PSY 547 Foundations of Social Cognitive and Affective Neuroscience, University of Pennsylvania *2020*
Instructor: Dr. Martha Farah
Provided one-on-one feedback and instruction to graduate students in other fields taking the course, graded exams.

Guest Lecturer; BE 566 Network Neuroscience, University of Pennsylvania *2019, 2020*
Instructor: Dr. Danielle Bassett
Topic: Functional brain networks, community structure, development, and socioeconomic status (SES).

Undergraduate Mentor; Changing Brain Lab, UPenn
Supervised literature reviews, led sessions on data analysis & statistics, taught behavioral and fMRI data collection, supervised presentation of literature at journal club meetings and presentation of research at lab meetings, guided writing research proposals.

- Aparna Ramanujam: 2018
- Ava Cruz: 2018
- Abigail Katz: 2018 - 2019 (Honors thesis)
- Hunter Liu: 2020
- Daisy Angeles: 2020
- Christina Recto: 2020-2021 (Honors thesis)
  - First-author poster accepted at OHBM 2021
- Kirsten Barboza: 2020-2021

Neuroanatomy Teaching Fellow; NGG 573 Systems Neuroscience, University of Pennsylvania *2019*
Instructors: Dr. Yale Cohen & Dr. Maria Geffen
Assisted in teaching neuroanatomy to first-year graduate students in hands-on labs, organized 3D printed neuroanatomy learning materials, held review sessions, gave guest lecture on cerebellar anatomy, graded final practical exams.

Undergraduate Mentor; Complex Systems Lab, UPenn
Taught statistics, provided guidance on data analysis and visualization, met weekly to review progress and findings.

- William Quinn: 2019

Vice-President of High School Coordination; Arizona Model United Nations, University of Arizona *2014*
Led the organization of a three-day bilingual, international conference for high schoolers simulating debate on global issues with over 600 attendees, and managed issues ranging from budget to advisor communication. Coordinated the activities of the Executive Board of nonprofit organization to prepare and arrange all aspects of the conference. Planned and conducted bimonthly educational trainings for schools in both the U.S. and Mexico prior to the conference.

Behavioral Health Paraprofessional; LifeStep, Dept of Psychology, University of Arizona *2013*
Provided weekly 4 hour sessions of life-skills training to an adolescent with behavioral health issues, maintained contact with client's case worker, wrote weekly reports for Arizona Child Protective Services and project supervisors.

Oral English Teacher; XinWen School, Liuyang, China *2012*
Developed curriculum and administered English lessons for classes from 3rd to 6th grade of 40+ students

each. Tutored and engaged in outside English practice with over 2,000 students.

Conversational Exchange Mentor; Center for English as a Second Language, University of Arizona *2012*
Assisted a Chinese student working towards a TOEFL in developing English language skills, engaged in weekly mentoring sessions focusing on English idioms, conversational speech, and social norms.

RESEARCH EXPERIENCE

Complex Systems Group, Dr. Danielle Bassett 2017
Rotation Student *University of Pennsylvania*

Investigated the impact of neighborhood SES on the development of functional network topology in youth ages 8-22 (PNC dataset).

Changing Brain Lab, Dr. Allyson Mackey 2017
Rotation Student *University of Pennsylvania*

Examined the influence of socioeconomic status on local connectivity in children ages 3-10 (PING dataset).

Kable Lab, Dr. Joseph Kable 2016
Rotation Student *University of Pennsylvania*

Conducted a connectome-wide analysis study (CWAS) of executive function abilities.

Stress, Neurobiology, and Prevention Science Lab, Dr. Phillip Fisher 2014-2016
Project Team Lead *University of Oregon*

Coordinated with colleagues at the Frontiers of Innovation (FOI) arm of the Harvard Center for the Developing Child to provide support to project teams, ensuring high-quality implementation and evaluation of science-based intervention strategies.

Provided consultation on research design, evaluation plans, instruments, and assessments to FOI-affiliated pilot projects.

Established and maintained a library of instruments and assessments for use across FOI projects, spearheaded the effort to select a battery of measures recommended across projects.

Collaborated with wide range of researchers, developers, agencies, and community personnel, adapted and designed new instruments in response to feedback.

Developed and oversaw a data repository for aggregation of past and current data from FOI projects, collected and scored data for selected projects, conducted analyses on aggregated data, wrote reports, and presented findings to the larger FOI community.

Social and Affective Neuroscience Lab & Developmental Social Neuroscience Lab, Drs. Elliott Berkman & Jennifer Pfeifer 2014-2016
Research Assistant *University of Oregon*

Supported the planning and implementation of a inhibitory control training study for adolescents, recruited and scheduled participants, oversaw school-based training sessions on alternate days, ran fMRI scans and participant assessments.

Down Syndrome Research Group, Drs. Jamie Edgin & Lynn Nadel 2012-2014
Research Assistant *University of Arizona*

Led the development and implementation of a longitudinal sleep study involving language and executive function in subjects ages 2-5, trained and managed undergraduate RAs, conducted literature reviews, administered participant assessments, oversaw data collection, and wrote reports and releases for the press.

Performed polysomnographic and actigraphic sleep studies on pediatric subjects aged 2-25 yrs., recruited and scheduled participants for all current studies.

Coded, entered, and analyzed actigraphy and language data with Actiware software and SPSS while maintaining continuous data management and medical record collection.
Administered paper-based evaluations of neurocognitive development, helped develop protocols to test executive and memory functions.

Social Neuroscience Lab, Dr. David Amodio 2013
Research Assistant *New York University*

Performed electroencephalographic (EEG) studies involving college-aged subjects presented with visual stimuli and analyzed collected data using SCAN.
Prepared and analyzed functional magnetic resonance imaging (fMRI) data during economic choice tasks using SPM.

Neural Decision Science Laboratory, Dr. Alan Sanfey 2011
Research Assistant *University of Arizona*

Supervised subjects completing behavioral assessments and computer-based tasks.
Analyzed collected data using R.

Human Nutrition Research Center, Dr. Loretta DiPietro 2009
Intern *United States Department of Agriculture, Beltsville, MD*

Monitored and kept records on over 60 subjects in calorimeters over continuous 48 hour periods, centrifuged and analyzed samples.

MANAGEMENT EXPERIENCE

Vice-President of Fundraising; Arizona Model United Nations, University of Arizona *2011*
Raised over $12,000 for nonprofit through planned events and directed marketing, initiated new projects with national and local corporate sponsors resulting in lasting partnerships, led over 120 members activity participation, kept weekly reports and accurate records on fulfillment of member requirements, oversaw 50% increase in club growth and fundraising needs.

SKILLS

Languages	Fluent French and English, Intermediate Mandarin Chinese
Software & Technical	R, Bash, LaTeX, MATLAB, FSL, Python, high-performance computing clusters
Training	OHBM Hackathon (Rome, Italy), Nipype workshop (MIT), Python bootcamp (UPenn), Digital Signal Processing course (RWTH Aachen; Aachen, Germany)
Certifications	Pennsylvania Dept. of Human Services Fingerprint Clearance, Teaching English as a Foreign Language (TEFL) Certificate