

## Curriculum Vitae

Susan Michelle Rivera

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### Education

Ph.D., Developmental Psychology, University of California, Berkeley, CA, December, 1998.  
BA, Psychology, Indiana University, Bloomington, IN, 1991.

### Positions Held

2017-present Chair, Department of Psychology, UC Davis  
2011-present Full Professor, Department of Psychology, UC Davis  
2008-2011 Associate Professor, with tenure Department of Psychology, UC Davis  
2001-2008 Assistant Professor, Department of Psychology, University of California at Davis  
1999-2001 Postdoctoral Research Fellow, Stanford Psychiatry Neuroimaging Lab, working with Professor Allan Reiss  
1998-1999 Postdoctoral Research Fellow, Center for Developmental Cognitive Neuroscience, working with Dr. Adele Diamond

### Honors, Fellowships and Awards

2016 Dean's Award for Diversity, Inclusion and Equity  
2015 UC Davis Diversity and Principles of Community Faculty Citation Award  
2014 Marie Curie Scholar, Birkbeck, University of London  
2010 Recipient of UC Davis School of Medicine Dean's Award for Excellence in Collaboration  
2010-2012 M.I.N.D. Institute Pilot Research Grant Award Recipient  
2005-2006 M.I.N.D. Institute Pilot Research Grant Award Recipient  
2005-2006 Grant to Promote Extra-Mural Funding, U.C. Davis  
2003-2004 Faculty Research Grant Recipient, U.C. Davis  
2003-2004 M.I.N.D. Institute Faculty Pilot Grant Award Recipient  
2001-2002 IGA Junior Faculty Research Award  
2000-2001 National Institute of Health Postdoctoral Training Fellowship  
1998-1999 National Institute of Health Postdoctoral Research Fellowship  
1998 Outstanding Graduate Student Instructor Award, U.C. Berkeley  
1997-1998 American Psychological Association Dissertation Research Award  
1996-1997 Graduate Division Dissertation Award Fellowship, U.C., Berkeley  
1995-1996 National Research Service Award, National Institute of Mental Health  
1992-1995 National Science Foundation Graduate Research Fellowship

### Professional Memberships

Cognitive Neuroscience Society	International Society for Developmental Psychobiology
Cognitive Development Society	Jean Piaget Society
International Society on Infant Studies	Society for Neuroscience
International Society for Autism Research	Society for Research in Child Development

## Panels and Advisory Positions

Editor in Chief: Human Development (July, 2019-present)

Associate Editor: Frontiers in Developmental Psychology

Editorial Board Member: Journal of Neurodevelopmental Disorders

Ad-hoc journal reviewer (*partial list*):

Archives of General Psychiatry	Developmental Psychology
Autism Research	Development and Psychopathology
Biological Psychiatry	Developmental Science
Brain	Frontiers in Human Neuroscience
Brain Research	Human Development
Child Development	Infancy
Cognitive Development	Journal of Neuroscience
Child Psychology and Psychiatry	Neuroimage
Developmental & Behavioral Pediatrics	

Executive Board Member:

Jean Piaget Society (2011-2020)

Grant Panel Reviewer:

NIH Study Section Member (CPDD), 2019- present

NIH Study Section Member (CP), 2013-2017

National Science Foundation, Cognitive Neuroscience program panel reviewer: 2003, 2009, 2010, 2011

Ongoing Ad-hoc grant reviewer for National Science Foundation

Ongoing Ad-hoc grant reviewer for Autism Speaks

Ongoing Ad-hoc reviewer for National Institutes of Health (NIMH, NICHD, NINDS)

## Publications

Zafarullah, M., Palczewski, G., **Rivera, S.M.**, Hessel, D. and Tassone, F. (in press.) Metabolic profiling reveals dysregulated lipid metabolism and potential biomarkers associated with the development and progression of fragile X-Associated Tremor/Ataxia Syndrome (FXTAS). *The FASEB Journal*.

Wang, J.Y., Danial, M., Soleymanzadeh, C., Kim, B., Xia, Y., Kim, K., Tassone, F., Simon, T., Hagerman, R.J., and **Rivera SM.** (2020.) Cortical gyrification and its relationships with molecular measures and cognition in children with the premutation of the fragile X mental retardation 1 gene. *Scientific Reports*. doi.org/10.1038/s41598-020-73040-0

Dwyer, P.D., Saron, C.D. and **Rivera, S.M.** (2020). Identification of Longitudinal Sensory Subtypes in Typical Development and Autism Spectrum Development Using Growth Mixture Modelling, *Research in Autism Spectrum Disorders*. <https://doi.org/10.1016/j.rasd.2020.101645>

**Rivera, S. M.**, Roberts, J. A., Wheeler, A. C., & Hagerman R.J. (2020). My Baby Has Just been Diagnosed with Fragile X Syndrome What Is There to Know? In R. J. Hagerman & P. J. Hagerman (Eds.), *Fragile X Syndrome and Premutation Disorders: New Developments and Treatments* (pp. 99-111). Riverside Publishing Solutions.

Gaigg, S.B., Krug, M.K., Solomon, Roestorf, M.A., Derwent, C., Anns, S., Bowler, D.M., **Rivera, S.M.**, Wu Nordahl, C. and Jones, E.J.H (2020). Eye-tracking reveals absent repetition learning across the autism spectrum: Evidence from a passive viewing task. *Autism Research*. doi:10.1002/aur.2368

Zafarullah, M., Tang, H.T., Johnson, B.D., Fourie, F., Hessel, D., **Rivera, S.M.**, Tassone, F. (2020). FMR1 Locus Isoforms: Potential Biomarker Candidates in Fragile X-Associated Tremor/Ataxia Syndrome (FXTAS). *Scientific reports*. doi.org/10.1038/s41598-020-67946-y

Dwyer, P.D, Wang, Xiaodong, De Meo-Monteil, Rosanna, Hsieh, Fushing, Saron, C.D. and **Rivera, S.M.** (2020.) Defining clusters of young autistic and typically developing children based on loudness-dependent auditory

electrophysiological responses. *Molecular Autism*, 11: 48. doi.org/10.1186/s13229-020-00352-3

Fourie, E., Palser, E.R., Pokorny, J.J, Neff, M. and **Rivera, S.M.** (2020). Neural processing and production of gesture in children and adolescents with autism spectrum disorder. *Frontiers in Psychology*. doi: 10.3389/fpsyg.2019.03045

Potter, L. A., Scholze, D. A., Biag, H. M. B., Schneider, A., Chen, Y., Nguyen, D. V, Rajaratnam, A., **Rivera, S.M.**, Patrick S. Dwyer, P.S., Tassone, F., Al Olaby, R.R, Choudhary, N.S., Salcedo-Arellano, M.J. and Hagerman, R. J. (2019). A randomized controlled trial of sertraline in young children with autism spectrum disorder. *Frontiers in Psychiatry*, v10, article 810. doi.org/10.3389/fpsyg.2019.00810

Wang, J.Y., Hessler, D.L., Tassone, F., Kim, K., Hagerman, R.J. and **Rivera S.M.** (2019). Interaction between Ventricular Expansion and Structural Changes in the Corpus Callosum and Putamen in Males with FMR1 Normal and Premutation Alleles. *Neurobiology of Aging*. doi.org/10.1016/j.neurobiolaging.2019.09.009

Biag, H.M.B., Potter, L.A., Wilkins, V., Afzal, S., Rosvall, A., Salcedo-Arellano, M.J., Rajaratnam, A., Manzano-Nunez, R., Schneider, A., Tassone F., **Rivera, S.M.**, Hagerman, R.J. (2019). Metformin treatment in young children with fragile X syndrome. *Mol Genet Genomic Med*, 956. https://doi.org/10.1002/mgg3.956

DeMeo, R., Wu Nordahl C., Amaral, D.G., Rogers, S., Harootonian, S.K., Martin, J., **Rivera, S.M.**, and Saron, C.D. (2019). Differential altered auditory ERP responses in young boys on the autism spectrum with and without disproportionate megalencephaly. *Autism Research*. doi: 10.1002/aur.2137.

Al Olaby, R.R., Tang, H-T., Durbin-Johnson, B., Schneider, A., Hessler, D., **Rivera, S.M.** and Tassone, F. (2018). Assessment of molecular measures in non-FXTAS male premutation carriers. *Frontiers in Genetics*, 9, 302. doi: 10.3389/fgene.2018.00302

Famula, J.L., McKenzie, F., McLennan, Y.A., Grigsby, J., Tassone, F., Hessler, D.R., **Rivera, S.M.**, Cerdeño, V.M. and Hagerman, R.J. (2018). Presence of middle cerebellar peduncle sign in asymptomatic FMR1 premutation carriers without tremor and ataxia. *Frontiers in Neurology*, 9, 695. doi: 10.3389/fneur.2018.00695

Shelton, A.L., Wang, J.Y., Fourie, E., Tassone, F., Chen, A., Frizzi, L., Hagerman R.J., Ferrer, E., Hessler, D.R., and **Rivera, S.M.** (2018). Middle cerebellar peduncle width- A novel MRI biomarker for FXTAS? *Frontiers in Neuroscience*, 12, 379. doi:10.3389/fnins.2018.00379

Koo, S. H., Kim, G., **Rivera, S.M.**, Pan, T., & Fong, D. (2018). Wearable Technology Design for Autism Spectrum Disorders. *Archives of Design Research*, 31(1), 37-55. doi: 10.15187/adr.2018.02.31.1.37

**Rivera, S.M.** (2018). Fragile x syndrome. In M. Bornstein (Ed.), *The SAGE encyclopedia of lifespan human development* (pp. 899-901). Thousand Oaks,, CA: SAGE Publications Ltd. doi: 10.4135/9781506307633.n335

Shickman, R., Famula, J., Tassone, F., Leehey, M., Ferrer, E., **Rivera, S.M.** and Hessler, D. (2018), Age- and CGG repeat-related slowing of manual movement in fragile X carriers: A prodrome of fragile X-associated tremor ataxia syndrome?. *Movement Disorders*. doi: 10.1002/mds.27314

Pokorny, J., Hatt, N.V., Rogers, S.J., and **Rivera, S.M.** (2017). What are you doing with that object? Comparing the neural responses of action understanding in adolescents with and without autism. *Journal of Autism and Developmental Disorders*. doi:10.1007/s10803-017-3338-3

Burris, J.L., Barry, R.A., and **Rivera, S.M.** (2017). An eye tracking investigation of attentional biases towards affect in young children. *Developmental Psychology*, 53(8):1418-1427. doi: 10.1037/dev0000345

Wang, J.Y., Trivedi, A.M., Carrillo, N.R., Yang, J., Schneider, A., Giulivi, C., Adams, P., Tassone, F., Kim, K., **Rivera, S.M.**, Lubarr, N., Wu, C., Irwin, R.W., Brinton, R.D., Olichney, J.M., Rogawski, M.A., and Hagerman, R.J. (2017). Open-label allopregnanolone treatment of men with fragile X-associated tremor/ataxia syndrome. *Neurotherapeutics*. doi: 10.1007/s13311-017-0555-6

**Rivera, S.M.**, Carlson, S.M., and Zelazo, P.D. (2017). Introduction to special issue: Current perspectives on neuroplasticity. *Cognitive Development*, 42, 1-3. doi: 10.1016/j.cogdev.2017.05.003

Yoo, K.H., Burris, J.L., Gaul, K.N., Hagerman, R.J., and **Rivera, S.M.** (2017). Low-dose sertraline improves receptive language in children with fragile X Syndrome when eye tracking methodology is used to measure treatment outcome. *Journal of Psychology and Clinical Psychiatry* 7(6): 00465. doi: 10.15406/jpcpy.2017.07.00465

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- Barry, R., Burris, J., Graf Estes, K., and **Rivera, S.M.** (2017). Caregivers and strangers: The influence of familiarity on gaze following and learning. *Infant Behavior & Development*, 46, 46–58. doi: 10.1016/j.infbeh.2016.11.005
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- Wang, J.Y., Hessler, D.R., Hagerman, R.J., Simon, T.J., Tassone, F., Ferrer, E., and **Rivera, S.M.** (2017). Abnormal trajectories in cerebellum and brainstem volumes in carriers of the fragile X premutation. *Neurobiology of Aging*, 55, 11-19.
- Gossett, A., Sansone, S., Schneider, A., Johnston, C., Hagerman, R.J., Tassone, F., **Rivera, S.M.**, Seritan, A., and Hessler, D. (2016). Psychiatric disorders among women with the fragile X premutation without children affected by fragile X syndrome. *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*, 171(8), 1139-1147. doi: 10.1002/ajmg.b.32496
- Wang, J.Y., Ngo, M.N., Hessler, D., Hagerman, R.J., and **Rivera, S.M.** (2016). Robust machine learning-based correction on automatic segmentation of the cerebellum and brainstem. *PLOS One*, 11(5). doi: 10.1371/journal.pone.0156123
- Schneider, A., Johnston, C.K., Tassone, F., Sansone, S., Hagerman, R., **Rivera, S.M.**, and Hessler, D. (2016). Broad autism spectrum and obsessive compulsive symptoms in adults with the fragile X premutation. *The Clinical Neuropsychologist*, 30(6), 929-943. doi: 10.1080/13854046.2016.1189536
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- Barry, R.A., Graf-Estes, K., and **Rivera, S.M.** (2015). Domain general learning: Infants use social and non-social cues when learning object statistics. *Frontiers in Psychology*, 6(551). doi: 10.3389/fpsyg.2015.00551
- Pokorny, J., Hatt, N.V., Colombi, C., Vivanti, G., Rogers, S.J., and **Rivera, S.M.** (2015). The action observation system when observing hand actions in autism and typical development. *Autism Research*, 8(3). doi: 10.1002/aur.1445
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- Wong, L.M., Goodrich-Hunsaker, N.J., McLennan, Y., Tassone, F., **Rivera, S.M.**, and Simon, T.J. (2014). A cross-sectional analysis of orienting of visuospatial attention in child and adult carriers of the fragile X premutation. *Journal of Neurodevelopmental Disorders*, 6(45). doi: 10.1186/1866-1955-6-45
- Gallego, P., Burris, J. and **Rivera, S.M.** (2014). Visual motion processing deficits in infants with the fragile X premutation. *Journal of Neurodevelopmental Disorders*, 6(1):29. doi: 10.1186/1866-1955-6-29
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- Wong, L., Goodrich-Hunsaker, N., McLennan, Y., Tassone, F., Zhang, M., **Rivera, S.M.** and Simon, T.J. (2014). Eye movements reveal impaired inhibitory control in adult male fragile X premutation carriers asymptomatic for FXTAS. *Neuropsychology*. 28(4): 571-84. doi: 10.1037/neu0000066. PMID: 24773414
- Leow, A., Harvey, D., Goodrich-Hunsaker, N., GadElkarim, J., Kumar, A., Zhan, L., **Rivera, S.M.**, and Simon, T. (2014). Altered structural brain connectome in young adult fragile X premutation carriers. *Human Brain Mapping*. 35(9):4518-30. doi: 10.1002/hbm.22491

- Kim, S.Y., Tassone, F., Simon, T.J., and **Rivera, S.M.** (2014). Altered neural activity in the 'when' pathway during temporal processing in fragile X premutation carriers. *Behavioral Brain Research*. 261:240-8. doi:10.1016/j.bbr.2013.12.044
- Kim, S.Y., Hashimoto, R.I., Tassone, F., Simon, T.J., and **Rivera S.M.** (2013). Altered neural activity of magnitude estimation processing in adults with the fragile X premutation. *Journal of Psychiatric Research*, 47(12) 1909-1916. doi:10.1016/j.jpsychires.2013.08.014
- Schneider, A., Seritan, A., Tassone, F., **Rivera, S.M.**, Hagerman, R., and Hessler, D. (2013). Psychiatric features in high-functioning adult brothers with fragile X spectrum disorders. *The Primary Care Companion*, 15(2). doi:10.4088/PCC.12l01492
- Wang, J.Y., Hessler, D., Schneider, A., Tassone, F., Hagerman, R.J., and **Rivera, S.M.** (2013). Fragile X-associated tremor/ataxia syndrome: Influence of the FMR1 gene on motor fiber tracts in males with normal and premutation alleles. *JAMA Neurology*, 70(8), 1022-1029. doi:10.1001/jamaneurol.2013.2934
- Wang, J.Y., Hagerman, R.J., and **Rivera, S.M.** (2013). A multimodal imaging analysis of subcortical gray matter in fragile X premutation carriers. *Movement Disorders*, 28(9), 1278-1284. doi:10.1002/mds.25473
- Owen, E.R., Baumgartner, H.A., and **Rivera, S.M.** (2013). Using infrared eye-tracking to explore ordinal numerical processing in toddlers with fragile X syndrome. *Journal of Neurodevelopmental Disorders*, 5(1). doi:10.1186/1866-1955-5-1
- Leigh, M.J., Nguyen, D.V., Mu, Y., Winarni, T.I., Schneider, A., Chechi, T., Polussa, J., Doucet, P., Tassone, F., **Rivera, S.M.**, Hessler, D., Hagerman, R.J. (2013). A randomized double-blind, placebo-controlled trial of minocycline in children and adolescents with fragile X syndrome. *Journal of Developmental and Behavioral Pediatrics*, 34(3), 147-155. doi:10.1097/DBP.0b013e318287cd17
- Wong, L., Goodrich-Hunsaker, N., McLennan, Y., Tassone, F., Harvey, D., **Rivera, S.M.**, and Simon, T.J. (2012). Young adult male carriers of the fragile X premutation (fXPCs) exhibit genetically modulated impairments in visuospatial tasks controlled for psychomotor speed. *Journal of Neurodevelopmental Disorders*, 4(1):26, doi:10.1186/1866-1955-4-26
- Kim, S.Y., Burris, J., Bassal, F., Koldewyn, K., Chattarji, S., Tassone, F., Hessler, D., and **Rivera, S.M.** (2012). Fear-specific amygdala function in children and adolescents on the fragile X spectrum: A dosage response of the FMR1 gene. *Cerebral Cortex*, 11, doi:10.1093/cercor/bhs341
- Wang, J.M., Koldewyn, K., Hashimoto, R., Schneider, A., Le, L., Tassone, F., Cheung, K., Hagerman, P., Hessler, D., and **Rivera, S.M.** (2012). Male carriers of the FMR1 premutation show altered hippocampal-prefrontal function during memory encoding. *Frontiers in Human Neuroscience*, 6, doi:10.3389/fnhum.2012.00297
- Wang, J.Y., Hessler, D., Iwahashi, C., Cheung, K., Schneider, A., Hagerman, R.J., Hagerman, P.J., and **Rivera, S.M.** (2012). Influence of the fragile X mental retardation (FMR1) gene on the brain and working memory in men with normal FMR1 alleles. *Neuroimage*, 65, 288-298. doi:10.1016/j.neuroimage.2012.09.075
- Indah Winarni, T., Chonchaiya, W., Adams, E., Au, J., Mu, Y., **Rivera, S.M.**, Nguyen, D.V. and Hagerman, R.J. (2012). Sertraline may improve language developmental trajectory in young children with fragile X syndrome: A retrospective chart review. *Autism Research and Treatment*, 2012, 1-8. doi:10.1155/2012/104317
- Wang, J.Y., Hessler, D.H., Hagerman, R.J., Tassone, F., and **Rivera, S.M.** (2012). Age-dependent structural connectivity effects in fragile X premutation. *Archives of Neurology*, 69(4), 482-489. doi:10.1001/archneurol.2011.2023
- Farzin, F., **Rivera, S.M.**, and Whitney, D. (2011). Resolution of spatial and temporal visual attention in infants with fragile X syndrome. *Brain*, 134(11), 3355-3368. doi:10.1093/brain/awr249
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- Goodrich-Hunsaker, N.J., Wong, L.M., McLennan, Y., Tassone, F., Harvey, D., **Rivera, S.M.**, and Simon, T.J. (2011). Enhanced manual and oral motor reaction time in young adult female fragile X premutation carriers. *Journal of the International Neuropsychological Society*, 21, 1-5. doi:/10.1017/S1355617711000634
- Koldewyn, K., Whitney, D., and **Rivera, S.M.** (2011). Neural correlates of coherent and biological motion perception in autism. *Developmental Science*, 14(5), 1075-1088. doi:10.1093/brain/awr249
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- Hashimoto, R., Backer, K.C., Tassone, F., Hagerman, R.J., and **Rivera, S.M.** (2011). An fMRI study of prefrontal activity during the performance of a working memory task in premutation carriers of the fragile X mental retardation 1 gene with and without fragile X-associated tremor/ataxia syndrome (FXTAS). *Journal of Psychiatric Research*, 45(1), 36-43. doi:10.1016/j.jpsychires.2010.04.030
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- Hashimoto, R., Javan, A.K., Tassone, F., Hagerman, R.J., and **Rivera, S.M.** (2011). A voxel-based morphometry study of grey matter loss in fragile X-associated tremor/ataxia syndrome. *Brain*, 134(3), 863-878. doi:10.1093/brain/awq368
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## Invited Talks and Addresses

**Rivera, S.M.** Exploring biomarkers for longitudinal symptom trajectories in developmental disorders: Insights from eye tracking and neuroimaging. Invited talk at the Waisman Center, University of Wisconsin. October 5, 2018.

**Rivera, S.M.** Neuroimaging and Eye Tracking Biomarkers for Understanding Symptom Trajectories in Developmental Disorders. Invited Plenary Address at the Gatlinburg Conference on Research and Theory in Intellectual and Developmental Disabilities, San Diego, CA, April, 2018.

**Rivera, S.M.** Visual attention as a window into understanding brain development in autism and fragile X syndrome. Invited talk at the Simons Center for the Social Brain, MIT. October 25, 2017.

**Rivera, S.M.** A tale of two academies: Experiences of underrepresented faculty. Invited SRCO Salon panelist at the Society for Research in Child Development biennial meeting, Austin, TX, April, 2017.

**Rivera, S.M.** Eye movements as window into brain development in typically and atypically developing children. Invited address at the International Congress of Infant Studies, New Orleans, LA, May 26-28, 2016.

**Rivera, S.M.** Gene-brain relationships in the fragile X spectrum of involvement. Invited talk at the Experimental Neuropsychology and Cognition Research Center, University of Montréal, January 22, 2016.

**Rivera, S.M.** Gene-brain relationships in the fragile X spectrum of involvement: Evidence from infancy to old age. Invited talk at the Sackler Institute, NYU School of Medicine. March 6, 2014.

**Rivera, S.M.** The fragile X spectrum of involvement: Gene-brain interactions across the lifespan. Talk given at Birkbeck, University of London as **Marie Curie Visiting Scholar**. January 15, 2014.

**Rivera, S.M.** Gene-brain-behavior relationships in disorders affecting numerical cognition. Invited workshop (faculty) at the Summer Institute in Cognitive Neuroscience, U.C. Santa Barbara, July 6, 2011.

**Rivera, S.M.** Investigating gene-brain relationships across the lifespan in the fragile X spectrum of disorders. Invited talk at U.C. Berkeley, March 10, 2011.

**Rivera, S.M.** Alterations in a fronto-parietal circuit may underlie many of the observed cognitive deficits seen across the fragile X spectrum. Invited Talk at Brandeis University, January 20, 2011.



**Rivera, S.M.** An overview of the U.C. Davis M.I.N.D. institute and review of ongoing research studies in autism and fragile X syndrome. Invited keynote address at the International Conference of Autism, Skive, Denmark, November 12-13, 2010.

**Rivera, S.M.** Early visual processing deficits in fragile X and autism. Invited talk at the Summer Institute on Neural Developmental Disorders, Sacramento, CA, August 6, 2010.

**Rivera, S.M.** Number processing in typical and atypical development. Invited talk at the Conference on Neurocognitive Development, Berkeley, CA, July 12-14, 2009.

**Rivera, S.M.** Neuroimaging of "spectrum disorders": Autism and fragile X syndrome. Invited Keynote address for the Imaging Research Center Fall Carnival, Davis, CA, Sept. 16, 2008.

**Rivera, S.M.** Neuroanatomical approaches to the study of math ability and disability. Invited talk at the Learning and the Brain Conference, San Francisco, CA, February 6-9, 2008.

**Rivera, S.M.** Eye tracking and baby studies: Investigations in fragile X syndrome. Invited symposium lecture at the 10th International Society for the Study of Behavioural Phenotypes Meeting, Sacramento, CA, October, 2007.

**Rivera, S.M.** The neural bases of quantitative reasoning: Insights from typical and atypical development. Invited talk at the American Educational Research Association Meeting, April 7-11, 2006.

**Rivera, S.M.** Functional neuroarchitecture of the autistic brain. Invited talk at the Summer Institute on Neurodevelopmental Disorders, August 4-5, 2005.

**Rivera, S.M.**, David, N., Barcellos, T., Henry, M.L. and Hagerman, R.J. Effects of the fragile X-associated tremor ataxia syndrome on cerebellar functioning: An fMRI study. Invited Symposium talk: 9<sup>th</sup> International Fragile X Conference, Washington, DC, June, 2004.

**Rivera, S.M.** Cerebellar dysfunction in older males with the fragile X premutation: An fMRI investigation. Invited symposium talk: 8th International Fragile X Conference, Chicago, IL, July 17-21, 2002.

## Recent Conference Presentations

Dwyer, P., Ferrer, E., Saron, C. D., & **Rivera, S. M.** (2020). Exploring sensory processing in typical development and autism spectrum development using factor mixture modelling and event-related potentials. Virtual poster presentation accepted by the Society for Psychophysiological Research Annual Meeting, Vancouver, BC, October, 2020.

Chernenok, M., Burris, J.L., **Rivera, S.M.**, & Bowman, L. (2020). Attention Bias and Neural Correlates of Arousal in School-Aged Children. Poster accepted to the 2020 Social & Affective Neuroscience Society, Santa Barbara, CA. Cancelled due to COVID-19.

Placido, D., Hessler, D., & **Rivera, S.M.** (2020). Differences in temporal parietal junction activation between fragile X premutation carriers who do and do not convert to having Fragile X-Associated Tremor Ataxia Syndrome. Talk presented virtually (due to COVID-19) at the NFXF International Fragile X Conference, Orlando, FL, July, 2020.

Wang, J.Y., Grigsby, J., Placido, D., Hessler, D., **Rivera, S.M.**, & Hagerman, R.J. (2020). The eye of the tiger sign in males carrying the normal and premutation alleles of the FMR1 gene. Talk presented virtually (due to COVID-19) at the NFXF International Fragile X Conference, Orlando, FL, July, 2020.

Dwyer, P., Wang, X., Hsieh, F., Saron, C. D., & **Rivera, S. M.** (2020). Exploring heterogeneity in auditory electrophysiological responses of young autistic and typically-developing children using hierarchical clustering. Oral presentation accepted by the INSAR 2020 Annual Meeting, Seattle, WA, May, 2020. Cancelled due to COVID-19 and presented as virtual poster.

Placido, D., Hessler, D., & **Rivera, S.M.** (2020). Temporal information processing deficits exhibited in Fragile X premutation carriers that convert to the full onset of Fragile X-Associated Tremor Ataxia Syndrome. Talk presented virtually (due to COVID-19) at the University of California at Davis Psychology Department Spring Conference, Davis, CA, May, 2020.

Camp, E., Dwyer, P., Sillas, A., & **Rivera, S. M.** (2020). Using eye tracking and a standardized assessment to explore cognition in autism. Virtual poster presentation at the UC Davis Undergraduate Research Conference, Davis, CA, May, 2020.

Prieto, M., Dwyer, P., Sillas, A., & **Rivera, S. M.** (2020). Examining attentional disengagement in autism using the gap-overlap paradigm. Virtual poster presentation at the UC Davis Annual Psychology Conference, Davis, CA, May, 2020.

Sudayuworn, T., Lopez, G., Dwyer, P., Sillas, A., & **Rivera, S. M.** (2020). Using passive eye tracking to measure receptive language comprehension in autism. Virtual poster presentation at the UC Davis Annual Psychology Conference, Davis, CA, May, 2020.

Tevelev, S., Dwyer, P., Sillas, A., & **Rivera, S. M.** (2020). An exploration of anxiety and threat bias in autism. Virtual poster presentation at the UC Davis Annual Psychology Conference, Davis, CA, May, 2020.

Dwyer, P., Saron, C. D., & **Rivera, S. M.** (2020). Examining inter-trial variability in, and habituation of, loudness-dependent auditory ERPs in young autistic and typically-developing children. Poster accepted by the 53rd Gatlinburg Conference, San Diego, CA, April, 2020. Cancelled due to COVID-19.

Saron, C. D., Takarae, Y., Mohammad-Rezazadeh, I, De Meo-Monteil, R., Dwyer, P., & **Rivera, S. M.** (2020). Inter- and intra-individual variability in multisensory integration in autism spectrum development: A behavioral and electrophysiological study. Invited symposium talk at Human Vision and Electronic Imaging 2020, Burlingame, CA, January, 2020.

Fourie, E., Palser, E. R., Pokorny, J.J., Neff, M. and **Rivera, S.M.** (2019). Atypical associations between gesture processing, performance and social symptoms in autism spectrum disorder. Poster presented at the International Society for Autism Research Annual Meeting, Montreal, Canada, 2019.

Nguyen, C., Webb, A., Chernenok, M., Burriss, J.L., **Rivera, S.M.**, & Bowman, L. (2019). A Neurophysiological Connection between Emotions Children See and Feel: Exploring links between LPP and NC ERP Components as a Model for Anxiety. Poster presented at the 2019 Cognitive Development Society, Louisville, KY, 2019.

Chernenok, M., Mclenithan, J., Jimenez, C., Burriss, J.L., **Rivera, S.M.**, & Bowman, L. (2019). Face Perception, Emotion Regulation, and Anxiety in Young Children: an N170 ERP Study. Poster presented at the 2019 Society for Research in Child Development, Baltimore, MD, 2019.

Dwyer, P., De Meo-Monteil, R., Saron, C. D., & **Rivera, S. M.**(2019). Age-related differences in auditory ERP responses to sounds of varying loudness in autism and typical development. Poster presented at the Society for Neuroscience conference, Chicago, IL, October, 2019.

Wang, J.Y, Daniai, M., Soleymanzadeh, C., Kim, B., Xia, Y., Kim, K., Tassone F., Simon, T., Hagerman, R.J., **Rivera, S.M.** Cortical gyrification and its relationships with FMR1 molecular measures and cognition in children with the FMR1 premutation (2019). Poster presentation, 4th International Conference on the FMR1 Premutation, Rotterdam, Netherlands 2019.

Wang, J.Y, Daniai, M., Soleymanzadeh, C., Kim, B., Xia, Y., Kim, K., Tassone F., Simon, T., Hagerman, R.J., **Rivera, S.M.** Cortical morphology in children with the FMR1 premutation (2019). Poster presentation, 50th Annual Meeting, Society for Neuroscience, Chicago, IL, USA, 2019.

Dwyer, P., De Meo, R., Saron, C. D., & **Rivera, S. M.** (2019). Relationships between auditory ERP responses and caregiver-reported sensory behaviours in young children with autism spectrum development. Oral presentation at the INSAR 2019 Annual Meeting, Montréal, QC, May, 2019.

Dwyer, P., Wang, X., De Meo-Monteil, R., Hsieh, F., Saron, C., & **Rivera, S. M.** (2019). Investigating sensory subtypes using auditory ERPs in young children with autism and typical development. In A. L. Hogan (Chair), Neurophysiological indicators of ASD-related behavioral phenotypes. Symposium at the 52nd Gatlinburg Conference, San Antonio, TX, April, 2019.

Dwyer, P., Wang, X., De Meo-Monteil, R., Hsieh, F., Saron, C., & **Rivera, S. M.** (2019). Defining sensory subtypes in young children with autism or typical development using loudness-dependent auditory ERPs. Poster presented at CNS 2019, San Francisco, CA, March, 2019.

Dwyer, P., De Meo-Monteil, R., Saron, C. and **Rivera, S.M.** (2018). Heterogeneity in the auditory ERP responses of young, typically-developing children. Poster presented at the 51<sup>st</sup> Annual Meeting of the International Society for Developmental Psychobiology, San Diego, CA, Oct 31-Nov 2, 2018.

Chernenok, M., Mclenithan, J., Jimenez, C., Burris, J. Bowman, L. and **Rivera, S.M.** (2018). Neural correlates of emotional picture processing in school-aged children. Poster presented at the 51<sup>st</sup> Annual Meeting of the International Society for Developmental Psychobiology, San Diego, CA, Oct 31-Nov 2, 2018.

Wang, J.Y., Hessler, D., Hagerman, R.J., **Rivera, S.M.** (2018). Progression from cerebellar atrophy to callosal deformation through expansion in lateral ventricles: a longitudinal study of FXTAS. Poster presentation, 16th International Fragile X Conference, Cincinnati, OH, 2018.

Fourie, E., Palser, E.R., Pokorny, J.J., Neff, M. and **Rivera, S.M.** (2018). Gesture processing and production in autism spectrum disorder. Poster presented at the Society for Neuroscience Meeting, San Diego, CA, Nov 3-7, 2018.

Burris, J.L., Oleas, D.S., and **Rivera, S.M.** (2018) Attentional biases towards emotion in young children with Autism Spectrum Disorder. Poster presented at the 51<sup>st</sup> Annual Gatlinburg Conference, San Diego, CA, April, 2018.

Dwyer, P., Burris, J.L., Bussey, T.R., and **Rivera, S.M.** (2018). Using eye tracking to examine the receptive vocabulary of young children on the autism spectrum. Poster presented at the 51<sup>st</sup> Annual Gatlinburg Conference, San Diego, CA, April, 2018.

Fourie, E. Shelton, A., Hessler, D., and **Rivera, S.M.** (2018). Amygdala Activity as a Predictor of fragile X-associated Tremor/ataxia Syndrome. Poster presented at the Cognitive Neuroscience Society Annual Meeting, Boston, MA, March, 2018.

Yoo, K.H., Burris, J.L., Gaul, K.N., Bussey, T., Hagerman, R.J., and **Rivera, S.M.** (2017) Using eye tracking to assess the effect of sertraline on language ability in children with fragile X syndrome. Poster presented at the 47th Annual Meeting of the Jean Piaget Society, San Francisco, CA, May, 2017.

Chernenok, M., Burris, J.L., and **Rivera, S.M.** (2017). Autism, Anxiety and the Role of Gene Expression in Female Children and Adolescents with fragile X Syndrome. Poster presented at the International Meeting for Autism Research, San Francisco, CA, May, 2017.

Chernenok, M., Burris, J.L., **Rivera, S.M.** (2017). Emotional Facial Expressions and Visual Exploration of Novel Objects. Poster presented at the 2017 Cognitive Development Society, Portland, OR, 2017.

Chernenok, M., Burris, J.L., Sims, R., Owen, E., & **Rivera, S.M.** (2017). Attention Shifting in Young Children with fragile X Syndrome. Poster presented at the 2017 International Society for Developmental Psychobiology, Washington, DC, 2017.

Burris, J.L., Barry, R.A., and **Rivera, S.M.** (2017) A longitudinal eye tracking investigation of attentional biases towards threat and their link to anxiety symptoms in early childhood. Poster presented at the Society for Research in Child Development biennial meeting, Austin, TX, April, 2017.

Burris, J.L., Barry, R.A., and **Rivera, S.M.** (2017). An eye tracking investigation of young children's use of emotional gaze cues and its link to attentional biases to threat. Poster presented at the Society for Research in Child Development biennial meeting, Austin, TX, April, 2017.

Sims, R.N., Burris, J.L., and **Rivera, S.M.** (2017). An eye tracking investigation of attention shifting between central and peripheral faces. Poster presented at the Society for Research in Child Development biennial meeting, Austin, TX, April 2017.

Barry, R.A., Burris, J.L., Graf Estes, K., and **Rivera, S.M.** (2017). The developmental trajectory of responding to conflicting gaze and language cues. Poster presented at the Society for Research in Child Development biennial meeting, Austin, TX, April, 2017.

Burris, J.L., and **Rivera, S.M.** (2016). A longitudinal eye tracking investigation of attentional biases towards threat in early childhood. Brief oral presentation presented at the International Society for Developmental Psychobiology, San Diego, CA, November, 2016.

Sims, R., Burris, J.L., and **Rivera, S.M.** (2016) Attentional biases towards emotional male and female faces in early childhood. Poster presented at the International Society for Developmental Psychobiology, San Diego, CA, November, 2016.

Barry, R.A., Burris, J.L., and **Rivera, S.M.** (2016). An eyetracking investigation of infants use of emotional gaze cues. Presented at the International Congress of Infant Studies, New Orleans, LA, May 26-28, 2016.

Barry, R.A., Graf-Estes, K., and **Rivera, S.M.** (2016). Mechanisms of selective learning in toddlers. Presented at the International Congress of Infant Studies, New Orleans, LA, May 26-28, 2016.

Burris, J.L., and **Rivera, S.M.** (2016). An eyetracking investigation of attentional biases towards threatening and happy faces. Presented at the International Congress of Infant Studies, New Orleans, LA, May 26-28, 2016.

Burris, J.L. and **Rivera, S.M.** (2015). An eye tracking account of developmental changes in attentional behavior towards threat in young children with fragile X syndrome. Talk presented at the 45th Annual Meeting of the Jean Piaget Society, Toronto, June, 2015.

Barry, R. and **Rivera, S.M.** (2015). Social attention and gaze-following: Factors that impact attention and learning. Symposium talk: Society for Research in Child Development biennial meeting, Philadelphia, PA, March, 2015.

Burris, J.L. and **Rivera, S.M.** (2015) Attentional biases towards threat in toddlers and young children with fragile X syndrome. Talk presented at the Society for Research in Child Development biennial meeting, Philadelphia, PA, March, 2015.

Burris, J.L., Tucci, J., McCurley, T., Raphael, S., McGee, B., and **Rivera, S.M.** (2015) The developmental trajectory of attentional biases to emotional male and female faces across the first two years of life. Presented at the Biennial Meeting of the Society of Research in Child Development, Philadelphia, PA, March, 2015.

Gaul, K., Burris, J.L., Halket, E., **Rivera, S.M.** (2015) Strengths and weaknesses in visuospatial processing and its relationship to autism symptomology in young boys with fragile X syndrome. Poster presented at the Biennial Meeting of Society for Research in Child Development, Philadelphia, PA, March, 2015.

**Rivera, S.M.** (2014) The effect of sertraline on language development in FXS using a passive-viewing eyetracking task. Talk presented at the 14th International Fragile X Conference, Orange County, CA, July, 2014.

Sievers, E. & **Rivera, S.M.** (2014) Brain activation to social evaluation using an implicit trust task in fragile X premutation carriers. Talk presented at the 14th International Fragile X Conference, Orange County, CA, July, 2014.

Owen, E. & **Rivera, S.M.** (2014). Numerical processing in FXS: An attention-shifting analysis. Talk presented at the 14th International Fragile X Conference, Orange County, CA, July, 2014.

**Rivera, S.M.** (2014). Visual attention in infants and toddlers with fragile X: Eye-tracking evidence for "when pathway" disruption. Talk presented at the XIX Biennial International Conference on Infant Studies, Berlin, Germany, July, 2014.

**Rivera, S.M.** (2013) Evidence of a dose response of the FMR1 gene in parietal and limbic brain circuits of fragile X premutation carriers. Talk presented at the First International Conference on FMR1 Premutation: Basic Mechanisms and Clinical Involvement, Perugia, Italy, July 2013.

**Rivera, S.M.** (2013) Visual motion processing deficits in infants with the fragile X premutation. Talk presented at the First International Conference on FMR1 Premutation: Basic Mechanisms and Clinical Involvement, Perugia, Italy, July 2013.

I Wang, J-Y., Hessel D., Schneider, A., Tassone, F., Hagerman, R.J. and **Rivera, S.M.** (2013). Influence of the FMR1 gene on motor fiber tracts in males with normal and premutation alleles. Talk presented at the First International Conference on FMR1 Premutation: Basic Mechanisms and Clinical Involvement, Perugia, Italy, July 2013.

Schneider A., Muzar Z., Summers S., Tassone F., Seritan A., **Rivera S.M.**, Grigsby J., Hessel D., and Hagerman R. (2013). Female characteristics of fragile X-associated tremor/ataxia syndrome. Talk presented at the First International Conference on FMR1 Premutation: Basic Mechanisms and Clinical Involvement, Perugia, Italy, July 2013.

Bailey, D.B., Berry-Kravis, E., De Sonia, A., Famula, J., Gane, L., Guarda, S., Hagerman, R., Hoffend, C., Lo J., Powell, C., **Rivera, S.M.**, Prescott, C., Roche, M., Rohde, S., Skinner, D., Sorenson, P., Tassone, F., and Wheeler, A. (2013). The fragile X newborn screening pilot study: Lessons learned from the detection of FMR1 premutation carrier infants. Talk presented at the First International Conference on FMR1 Premutation: Basic Mechanisms and Clinical Involvement, Perugia, Italy, July 2013.

Bailey D.B., Wheeler A., Hoffend C., Prescott C., De Sonia A., Berry-Kravis E., Sorenson P., **Rivera S.M.**, Hagerman R., and Tassone F. (2013). Early development and behavior of FMR1 premutation infants identified by newborn screening. Talk presented at the First International Conference on FMR1 Premutation: Basic Mechanisms and Clinical Involvement, Perugia, Italy, July 2013.

**Rivera, S.M.**, deGennaro, P., Gallego, P., Niemeier, G., Kaltman, E., Wakeley, A., and Langer, J. (2013). Video game training on inverse spatial relations as a way to facilitate proportional reasoning in children. Poster presented at the Biennial Meeting of Society for Research in Child Development, Seattle, WA, April, 2013.

Barry, R., Graf Estes, K., and **Rivera, S.M.** (2013). Do social and nonsocial cues enhance statistical learning in distracting environments? Poster presented at the Biennial Meeting of Society for Research in Child Development, Seattle, WA, April, 2013.

Owen, E., and **Rivera, S.M.** (2013). Attention shifting in infants with fragile X syndrome; Investigating the brain's orienting network. Poster presented at the Biennial Meeting of Society for Research in Child Development, Seattle, WA, April, 2013.

Sievers, E., Pokorny, J., Neff, M., and **Rivera, S.M.** (2013). Development of the neural correlates of gesture processing in adolescence. Poster presented at the Biennial Meeting of Society for Research in Child Development, Seattle, WA, April, 2013.

Kim, S.-Y., Hashimoto, R.I., Simon, T.J., & **Rivera, S.M.** (2013). Developmental changes in neural substrates of spatiotemporal processing in adults and children with the fragile X premutation. Poster presented at the 2013 Cognitive Neuroscience Society meeting, San Francisco, CA, April, 2013.

**Rivera, S.M.** (2013). Evidence of visual processing impairments in infants with the fragile X premutation. Talk presented at the 46th Annual Gatlinburg Conference, San Antonio, TX, March, 2013.

**Rivera, S.M.** (2012). Five years of studying the visual and early cognitive development of Infants and toddlers with fragile X syndrome: What have we learned? Talk presented at the 13th International Fragile X Conference, Miami, FL, July, 2012.

Kim, S.-Y., Simon, T.J., & **Rivera, S.M.** (2012). Differences in brain activation during temporal working memory processing in fragile X premutation carriers. Talk presented at the 13th International Fragile X Conference, Miami, FL, July, 2012.

Rothstein, L., Gallego, P., Burriss, J., **Rivera, S.M.** (2012). Ventral stream visual processing in infants and toddlers with fragile X syndrome. Poster presented at the 13th International Fragile X Conference, Miami, FL, July, 2012.

Wang J.Y., Hagerman R.J., and **Rivera S.M.** (2012). A multimodal imaging study of subcortical gray matter abnormalities in fragile X premutation. Talk presented at the 13th International Fragile X Conference, Miami, FL, July, 2012.

Owen, E. and **Rivera, S.M.** (2012). Attention shifting in infants with fragile X syndrome; Investigating the brain's orienting network. Talk presented at the 13th International Fragile X Conference, Miami, FL, July, 2012.

Burriss, J. and **Rivera, S.M.** (2012). Efficacy measures of minocycline on visual processing and spatial reasoning in children and adolescents with fragile X syndrome. Talk presented at the 13th International Fragile X Conference, Miami, FL, July, 2012.

Gallego, P.K. and **Rivera, S.M.** (2012). Math and conservation in children with FXS. Talk presented at the 13th International Fragile X Conference, Miami, FL, July, 2012.

Wang, J.Y., Hessel, D., Schneider, A., Hagerman, R.J., Tassone, F., and **Rivera, S.M.** (2011). The associations of FMR1 expression, white matter connectivity, and cognition in healthy males. Talk presented at the 41st Annual Society for Neuroscience Meeting, Washington, D.C., November, 2011.

Garcia-Arocena, D., Wang, J., Selmezy, D., Tassone, F., Fon, J., Woo, E., Hagerman, R.J., Hagerman, P.J. and **Rivera, S.M.** (2011). Impact of telomeres in patients with fragile X-Associated Tremor/Ataxia Syndrome. Talk presented at the 41st Annual Society for Neuroscience Meeting, Washington, D.C., November, 2011.

Kim, S.-Y., Burriss, J., Bassal, F., Tassone, F., Hessel, D. and **Rivera, S.M.** (2011). Socio-emotional dysfunction and its relationship with neural correlates of emotional processing in children and adolescents with fragile X

syndrome. Poster presented at the 41st Annual Society for Neuroscience Meeting, Washington, D.C., November, 2011.

Pokorny, J.J., Hatt, N.V., Rogers, S.J., and **Rivera, S.M.** (2011). The neural basis of intention understanding in autism and typical development. Poster presented at the 41st Annual Society for Neuroscience Meeting, Washington, D.C., November, 2011.

**Rivera, S.M.** (2011). Playing video games that target understanding of inverse spatial relations facilitates reasoning about causal proportions in children. Talk presented at the 41st Annual Meeting of the Jean Piaget Society, Berkeley, CA., June, 2011.

Kim, S.Y., Burris, J., Basal, F., Tassone, F., and **Rivera, S.M.** (2011). Amygdala dysfunction in children and adolescence with fragile X syndrome. Poster presented at the International Meeting for Autism Research, San Diego, CA., May, 2011.

Pokorny, J., Hatt, N.V., Colombi, C., Vivanti, G., Rogers, S.J. and **Rivera, S.M.** (2011). The effect of object goals and visibility on the mirror neuron system in autism and typical development. Poster presented at the International Meeting for Autism Research, San Diego, CA., May, 2011.

Kim, S.-Y., Hashimoto, R., Simon, T.J., and **Rivera, S.M.** (2011). Evidence for a dose-sensitive response to FMR1 gene expression in the fronto-parietal cortex for the numerical processing. Poster presented at the 18th Annual Meeting of the Cognitive Neuroscience Society, San Francisco, CA., April, 2011.

Pokorny, J.J., Hatt, N., Rogers, S.J., and **Rivera, S.M.** (2011). Action understanding and the mirror neuron system in autism and typical development. Poster presented at the Jacobs Foundation Conference 2011 on Adolescence: Exploration and Self-Regulation of the Unknown, Marbach Castle, Germany, April, 2011.

Gallego, P.K., Owen, E.R., Burris, J., and **Rivera S.M.** (2011). Live object occlusion and tracking in infants with FXS. Poster presented at the Biennial Meeting of Society for Research in Child Development, Montreal, Canada, March, 2011.

Wang, J.Y., Hessler, D., Tassone, F., Schneider, A., Iwahashi, C., Hagerman, P.J., and **Rivera, S.M.** (2010). A comprehensive assessment of structural connectivity in fragile X premutation. Talk presented at the 40th Annual Meeting, Society for Neuroscience, San Diego, CA., November, 2010.

**Rivera, S.M.** (2010). White and gray matter changes in FXTAS and non-FXTAS premutation carriers. Talk presented at the 12th International Fragile X Conference, Detroit, MI., July, 2010.

**Rivera, S.M.** (2010). Parietal cortex shows a dose-sensitive response to FMR1 gene expression in carriers of the fragile X permutation. Talk presented at the 12th International Fragile X Conference, Detroit, MI., July, 2010.

**Rivera, S.M.** (2010). Tracing trajectories of strengths and challenges in young children with fragile X syndrome: why development itself is so important. Talk presented at the 12th International Fragile X Conference, Detroit, MI., July, 2010.

**Rivera, S.M.** (2010). Converging evidence for disruption of parietal lobe function in infants with fragile X syndrome. Talk presented at the 12th International Fragile X Conference, Detroit, MI., July, 2010.

Owen, E. and **Rivera, S.M.**, (2010). Numerical processing in infants with FXS. Talk presented at the 12th International Fragile X Conference, Detroit, MI., July, 2010.

Farzin, F. and **Rivera, S.M.** (2010). Spatial and temporal visual attention in infants with FXS. Talk presented at the 12th International Fragile X Conference, Detroit, MI., July, 2010.

Wang, J. and **Rivera, S.M.** (2010). Age related deficiency of structural connectivity in fragile X premutation males without tremor/ataxia syndrome. Poster presented at the 12th International Fragile X Conference, Detroit, MI., July, 2010.

Wang, J.M., Tassone, F., Iwahashi, C., Hagerman, P.J., Hessler, D.R., and **Rivera, S.M.** (2010). Differences in amygdala activation correlate with molecular measures in male carriers of the FMR1 premutation. Talk presented at the 12th International Fragile X Conference, Detroit, MI., July, 2010.

Gallego, P., Owen, E., and **Rivera, S. M.** (2010). Cognitive outcomes through behavioral therapeutic intervention in infants with FXS. Poster presented at the 12th International Fragile X Conference, Detroit, MI., July, 2010.

**Rivera, S.M.** and Hessler, D. (2010). Capturing the fragile X premutation phenotypes: Issues and complexities. Paper presented at the Gatlinburg Conference on Research & Theory in Intellectual & Developmental Disabilities. Baltimore, MD, March, 2010.

**Rivera, S.M.**, Hashimoto, R., Hatt, N.V., Shapiro, H. and Simon, T.J. (2009). Evidence for a dose-sensitive response to FMR1 gene expression in the fronto-parietal cortex. Paper presented at annual Society for Neuroscience meeting, Chicago, IL., October, 2009.

**Rivera, S.M.** (2009). Object representation and tracking in infants with fragile X syndrome. Paper presented at European Science Foundation Conference: Gene Expression to Neurobiology and Behaviour, Sant Feliu de Guixols, Spain, September, 2009.

Hashimoto R., Hatt N., Shapiro H., Marcelino L., Godwin C., Simon T.J., and **Rivera S.M.** (2009). Altered cortical activity of the numerical system in individuals with fragile X mutations. Presented at the 64th Annual Scientific Convention & Meeting of Society of Biological Psychiatry, Vancouver, Canada, May, 2009.

Hashimoto R., Backer K., Hagerman R.J., and **Rivera S.M.** (2009). An fMRI study of working memory deficits in premutation carriers of the fragile X mental retardation 1 gene with and without fragile X-associated tremor/ataxia syndrome. Presented at the 15th Annual Meeting of Human Brain Mapping, San Francisco, CA., June, 2009.

Farzin, F., **Rivera, S.M.**, Sakai, S.M., and Whitney, D. (2009). Temporal limit of phase discrimination in infants. *Journal of Vision*. Presented at the Annual Vision Sciences Society Meeting, Naples, FL, May 2009.

Hatt, N.V., Colombi, C., Saron, C.D., Rogers, S.J., Saron, C.D., and **Rivera, S.M.** (2009). Neural basis of action and intention understanding in autism and typical development. Presented at the International Meeting for Autism Research, Chicago, IL, May, 2009.

Colombi, C., Saron, C.D., Beransky, M., Takarae, Y., Vivanti, G., Nadig, A., **Rivera, S.M.**, Champion-Fritz, Z., Ozonoff, S., and Rogers, S.J. (2009). Mirror neuron system activation in autism in response to transitive and intransitive actions. Presented at the International Meeting for Autism Research, Chicago, IL, May, 2009.

Marcelino, L.M., Beransky, M., Colombi, C., Riggins, T., Horton, D.M., Deprey, L. Kenet, TI, Rogers, S.J., **Rivera, S.M.**, and Saron, C.D. (2009). Subphenotyping of autism spectrum disorders using auditory event-related potentials. Presented at the International Meeting for Autism Research, Chicago, IL, May, 2009.

Farzin, F., Whitney, D., and **Rivera, S.M.** (2009). Spatiotemporal contrast sensitivity in 6- to 15-month-old infants. Presented at the Biennial Society for Research in Child Development Meeting, Denver, CO, April, 2009.

Hendrickson, K.I., Farzin, F., Hagerman, R.J., and **Rivera, S.M.** (2009). Changing developmental trajectories in young infants with fragile X syndrome. Presented at the Biennial Society for Research in Child Development Meeting, Denver, CO, April, 2009.

Wang, J.M., Koldewyn, K., Hessler, D.A., Selmecky, D. Hagerman, R.J., Hagerman, P.J., Iwahashi, C., Tassone, F., Schneider, A., and **Rivera, S.M.** (2009). Fragile X mental retardation-1 gene mRNA as a predictor for amygdala volume in fragile X premutation men. Presented at the annual Cognitive Neuroscience Society Meeting, San Francisco, CA, March, 2009.

**Rivera, S.M.**, Koldewyn, K., Le, L., Hagerman, R.H., Tassone, F., Gane, L, Schneider, A., and Hessler, D.L. (2008). Amygdala and hippocampal function in the fragile X premutation: linking genes, behavior and brain function. Paper presented at annual Society for Neuroscience meeting, Washington, D.C., November 2008.

Beransky, R.M., Marcelino, L.M., Colombi, C., Horton, D.M., DeBoer, T.D., **Rivera, S.M.** and Saron, C.D. (2008). Electrophysiological subphenotyping of autism based on the loudness dependency of auditory event-related potentials. Poster presented at annual Society for Neuroscience meeting, Washington, D.C., November 2008.

Farzin, F., Whitney, D., and **Rivera, S.M.** (2008). Low-level visual processing in infants with FXS. Paper presented at the 11th International Fragile X Conference, St. Louis, MO, July, 2008.

**Rivera, S.M.** and Farzin, F. (2008). High-level cortical visual processing in infants with fragile X. Paper presented at the 11th International Fragile X Conference, St. Louis, MO, July, 2008.

Farzin, F., **Rivera, S.M.**, Weru, J., and Hessler, D. (2008). Face processing in individuals with fragile X syndrome: An eye tracking study. Presented at the 11th International Fragile X Conference, St. Louis, MO, July, 2008.

Koldewyn, K., Le, Lien, Hagerman, R.J., Tassone, F., Gane, L., Schneider, A., Hessler, D.R., and **Rivera, S.M.** (2008). Functional imaging of the limbic system in men with the fragile X premutation, Presented at the 11th International Fragile X Conference, St. Louis, MO, July, 2008.

Farzin F., **Rivera S.M.**, and Whitney D. (2008). Holistic face processing in infants using Mooney faces. Poster presented at the Annual Vision Sciences Society Meeting, Naples, FL, May 2008.

Koldewyn, K., Whitney, D.W., and **Rivera, S.M.** (2008). Neural bases of visual motion perception deficits in autism. Paper presented at the Annual Vision Sciences Society meeting, Naples FL, May 2008.

Koldewyn, K., Whitney, D.W., and **Rivera, S.M.** (2008). Neural correlates of coherent and biological motion perception deficits in autism. Poster presented at the International Meeting for Autism Research, London, England, May 2008.

Koldewyn, K., Whitney, D.W., and **Rivera, S.M.** (2007). Visual motion processing in autism: A psychophysical and fMRI study. Poster presented at annual Society for Neuroscience meeting, San Diego CA, November 2007.

Reynolds Losin, E.A., **Rivera, S.M.**, O'Hare, E.D., Sowell, E.R. and Pinter, J.D. (2007). fMRI findings of abnormal activation patterns during an auditory story listening task in individuals with Down syndrome. Poster presented at annual Society for Neuroscience meeting, San Diego CA, November 2007.

**Rivera, S.M.**, Hessler, D.L., Koldewyn, K., Tassone, F. and Hagerman, R.J. (2007). Brain-based evidence of limbic system dysfunction in fragile X premutation carriers. Paper presented at the 13th International Workshop on Fragile X and X-Linked Mental Retardation, Venice, Italy, October, 2007.

Farzin, F. and **Rivera, S.M.** (2007). Object representation and tracking in infants with fragile X syndrome. Paper presented at the 10th International Society for the Study of Behavioural Phenotypes Meeting, Lake Tahoe, CA, October, 2007. *Journal of Intellectual Disability Research*, 51(9).

Koldewyn, K., Henry, M. Le, L., and **Rivera, S.M.** (2007). Children with autism show differences in brain activation, despite similar behavioral performance, on a mental arithmetic task. Poster presented at the Cognitive Neuroscience Society Meeting, New York, NY, May 5-8, 2007.

Reynolds, E.A., Pinter, J., Koldewyn, K., Le, L., Backer, K., Tang, M., and **Rivera, S.M.** (2007). Deficient intraparietal sulcus activity during number comparison in individuals with Down syndrome. Poster presented at the Cognitive Neuroscience Society Meeting, New York, NY, May 5-8, 2007.

Saron, C.D., Horton, D.M., DeBoer, T., Beransky, M., Colombi, C., and **Rivera, S.M.** (2007). Attenuated primary auditory cortex activation in toddlers with autism spectrum disorders: Evidence from high-density middle latency AEPs. Poster presented at the International Meeting for Autism Research, Seattle, WA, May 3-5, 2007.

Farzin, F., Whitney, D., Hagerman, R.J. and **Rivera, S.M.** (2007). Visual processing in infants with fragile X syndrome. *Journal of Vision*, Annual Vision Sciences Society Meeting, Sarasota, FL, May 2007.

Farzin, F., Whitney, D., Hagerman R.J. and **Rivera S.M.** (2007). Visual development in infants with fragile X syndrome. Poster presented at the Biennial Meeting of the Society for Research in Child Development, Boston, MA, March 2007.

Zawaydeh, A.N., Farzin F., and **Rivera, S.M.** (2007). The effect of language on infants' object representation system: An investigation using eye-tracking methodology. Poster presented at the Biennial Meeting of the Society for Research in Child Development, Boston, MA, March 2007.

## Research Support

### Active:

**9R01NS110100-11** (Rivera, S.M./Hessler, D., M/PI)

NIH/NINDS

Trajectories and Markers of Neurodegeneration in Fragile X Premutation Carriers

07/01/2018-6/30/2023

\$3,863,000 *total direct*



Carriers of the fragile X premutation are at increased risk for developing a late-onset neurological disease, Fragile X-Associated Tremor Ataxia Syndrome (FXTAS). This study follows a group of men with the fragile X premutation and healthy controls in a longitudinal study to examine the trajectory of change in brain structures, neuropsychological and neurological functioning, and genetic markers in an effort to determine factors explaining the early disease process that will occur in some of these men, and to develop sensitive measures for tracking response to intervention in future studies.

Role: PI

**1P50HD093079-01** (Amaral, D.)  
NIH/NICHD

9/07/2017- 7/31/2022  
\$8,317,840 *total direct*

Center for the Development of Phenotype-Based Treatments of Autism Spectrum Disorder

This Autism Center for Excellence grant aims to discover effective treatments for subgroups of children with ASD. The Center starts from the premise that one treatment will not fit all children with ASD. If clinically meaningful subgroups can be identified on the basis of behavioral, biological or genetic features, treatments targeted to the characteristics of the subgroup will undoubtedly be more effective. The Center's relevance to public health is evident as the behavioral and biological diagnostic information gathered will inform the most effective treatment decisions and greatest reduction of disability for individuals with ASD.

Role: M/PI Project 2

**R01HD036071-19** (Hagerman, R.J.)  
NIH/NICHD

6/15/1998-2/28/2022  
\$2,067,500 *total direct*

Genotype-Phenotype Relationships in Fragile X Families

The proposed prospective study of individuals with FXTAS will quantify (with clinical, radiological, and molecular/bioenergetic measures) our understanding of progression, elucidate those co-morbid conditions that modulate progression, and identify the most informative biomarkers of severity and progression.

Role: Co-Investigator

### **Completed:**

**3R01MH078041-09S1** (Rivera, S.M.)  
NIH/NIMH

07/01/2016 – 03/31/2018  
\$149,492 *total direct*

Trajectories and Markers of Neurodegeneration in Fragile X Premutation Carriers-Supplement

This supplement to the parent R01 supports the development of protocols to apply automatic segmentation techniques for brain segmentation that have shown enormous promise for elucidating changes in brain morphology that may start in young premutation carriers many years before the clinical manifestations of FXTAS. The development of these techniques will greatly increase the value of the findings from the parent grant by allowing us to detect even more subtle changes in brain morphology than would have been picked up by methods originally proposed.

Role: PI

**HRD 1209325** (Katehi, L)  
NSF ADVANCE Institutional Transformation

9/1/2012-8/31/2018  
\$3,575,000 *total direct*

Institutional transformation to build and sustain a diverse community of innovative STEM scholars.

The UC Davis ADVANCE program utilizes a four-pronged approach to increasing the participation and advancement of women in the STEM fields. This approach includes: establishment of a Center for Advancing Multi-Cultural Perspectives on Science (CAMPOS), implementation of programs to reduce the impact of unconscious bias, empowerment of STEM women faculty, and a rigorous social science research and evaluation program that is designed to both inform and assess the innovative approach being utilized to create and sustain an inclusive STEM environment.

Role: co-Investigator

**2R01MH078041-06** (Rivera, S./Hessl, D., M/PI)  
NIH/NIMH

4/8/2013-3/31/2018  
\$3,056,096 *total direct*

Trajectories and Markers of Neurodegeneration in Fragile X Premutation Carriers

This project will follow a group of men with the premutation and healthy controls in a longitudinal study to examine the trajectory of change of the structure and function of the brain and neuropsychological measures in an effort to determine factors explaining the early disease process that will occur in some of these men.

Role: PI

**Interdisciplinary Research Seed Funding** grant (Rivera, S.M.)

11/15/2015-6/30/2018

UC Davis Institute of Social Sciences

\$10,000 *total direct*

Development of an ERP outcome measure for treatment studies in Autism Spectrum Disorder

This grant supports the development of an event related potential (ERP) outcome measures designed to reveal subtle changes that are taking place in the brain of children with autism spectrum disorder as they undergo treatment.

Role: PI

**R01HD036071-14** (Hagerman, R.J.)

4/1/2012-3/31/2017

NIH

\$2,091,505 *total direct*

Genotype-Phenotype Relationships in Fragile X Families

This proposal will assess detailed molecular mechanisms including mitochondrial abnormalities, mosaicism between the lymphocytes and fibroblasts, the antisense FMR1 (ASFMR1) splice isoforms and occult methylation to determine the molecular markers of premutation clinical involvement.

Role: Co-Investigator

**UCD2014P14** (Rivera, S.)

8/11/2014-9/31/2016

PHRMA FOUNDATION

\$120,000 *total direct*

Increased mitochondrial DNA damage and neurodegeneration in fragile X-associated tremor/ataxia syndrome.

This project investigates genetic bases for brain abnormalities in genetic disorders such as fragile X premutation and full mutation and neurodegenerative disorders including Alzheimer's disease and Parkinson's disease in which mtDNA mutation is thought to play a significant role.

**1 R40MC22641-01-00** (Hagerman, R.)

9/1/2011-8/31/2014

HRSA

\$1036782 *total direct*

Controlled Trial of Sertraline in Young Children with Fragile X Syndrome

This project evaluates the benefit of sertraline for treatment of early developmental delay, including language delays, social deficits and attentional deficits, in young children with FXS.

Role: Co-Investigator

**1 R01MH090194, Subaward No. 13-2320** (Rivera, S.)

3/1/2013-2/28/14

NIH/NIMH

\$10,806

Emergence and Stability of Autism in fragile X Syndrome

This is a longitudinal prospective study of the early autism features in infants with FXS and FXpm at 9, 12, and 24 in contrast to infants with an older sibling diagnosed with autism (hereafter referred to as "ASIBS") and typical controls (TD).

Role: PI of subaward (Roberts, J. PI of main award)

**2R01MH068398** (Ozonoff)

1/1/09-11/30/13

NIH/NICHD

\$2,919,155 *total direct*

Infants at Risk: A Longitudinal Study

In this grant, infant siblings of children with autism are followed longitudinally as is the original sample of infant sibs as they enter school. Experimental measures will focus on underlying processes that may reveal differences in at-risk children prior to the onset of behavioral signs of disorder.

Role: Co-Investigator

- 3 R01 MH078041-04S1** (Hessl/Rivera) 07/01/11-06/31/13  
NIH/NIMH \$3,750,000 *total direct*  
Limbic system function in carriers of the fragile X premutation  
This revision to the parent grant will investigate relations between molecular, genetic, neuropsychological and physiological systems underlying social-emotional and memory functioning in adult females with the fragile X premutation.  
Role: co-PI
- 1 R01 MH078041** (Hessl/Rivera) 6/1/07-5/31/12  
NIH/NIMH \$1,500,000 *total direct*  
Limbic system function in carriers of the fragile X premutation  
This project investigates relations between molecular genetic, neuropsychological and physiological systems underlying social-emotional and memory functioning in adult males with the fragile X premutation.  
Role: Co-PI
- 1 R01 HD056031** (Rivera) 8/8/07-5/31/12  
NIH/NICHD \$ 1,274,000 *total direct*  
Visual Processing and Later Cognitive Effects in Infants with fragile X Syndrome  
This project is a prospective, longitudinal study that will elucidate early visual processing differences in infants with fragile X Syndrome and how abnormal visual processing, if present, relates to cognitive deficits known to emerge in early childhood.  
Role: PI
- 1 RL1NS062412** (Simon/Rivera) 09/30/07-06/30/12  
NIH/NINDS \$1,792,000 *total direct*  
Fragile X Spectrum as a Model to Explore Mechanisms in Neurogenetic Disorders  
Component 5 of 1UL1RR024922-01 Hagerman, PJ (P.I.) NIH/NCRR  
NeuroTherapeutics Research Consortium  
The principal objective of Component 5 is to understand how variations in the mutation of a single gene (FMR1) produce a spectrum of cognitive dysfunction in both childhood and adulthood. To this end, we will generate the first detailed neurocognitive profile of an integrated set of cognitive domains that preliminary data suggest are highly vulnerable to changes in the expression of FMRP.  
Role: Co-PI on Component 5
- 3P30-HD02274** (Tassone) 7/1/2008-6/30/2013  
NIH/NICHD \$3,457,150 *total direct*  
Fragile X Research Center and Newborn Screening at UC Davis  
This is a component of a center grant in collaboration with the University of Washington, and involves newborn screening and clinical research with newborn probands with fragile X and their extended family members.  
Role: Co-Investigator
- Pilot Grant Program (Rivera) 07/01/10-2/31/13  
**U.C. Davis M.I.N.D. Institute** \$25,000  
Identifying Meaning in Gestural Cues in Autism: A behavioral and fMRI study  
The goal of this project is to investigate how individuals with autism recognize social cues, such as gestures and body postures. This will be studied, behaviorally and using fMRI, by parametrically varying the intensity of the gestural cues so that we can determine how exaggerated the behavior must be before individuals with autism can detect the meaning of the action.  
Role: PI

**1R01MH089626** (Amaral, D., Rogers, S., Van de Water, J.) 09/21/09-08/31/11  
NIH/NIMH \$1,429,402  
Interdisciplinary Investigation of Biological Signatures of Autism Subtypes  
The overall goal of this interdisciplinary project is to identify different subtypes of autism based on behavioral, biochemical, and brain imaging markers.  
Role: Co-Investigator

**Translational Research re: FXD** (Hagerman, R.) 9/1/2009-8/31/2011  
National Fragile X Foundation \$50,000  
A Double-Blind Randomized Controlled Cross-over Trial of Minocycline in Children with Fragile X Syndrome  
The overall goal of this project is to evaluate the efficacy of minocycline in individuals with fragile X syndrome.  
Role: Co-Investigator

**Administrative Supplement** (Berglund) 10/01/2009-08/30/2011  
NIH/NCRR \$325,000  
A Toolbox of Outcome Measures for Targeted Treatment Trials in Children - UC Davis Clinical and Translational Science Center  
The overall goal of this project is to create a toolbox of quantitative measures that can be utilized in targeted treatment trials for neurodevelopmental disorders in children.  
Role: Co-Investigator

**1 R21 MH080025** (Rivera) 9/1/07-5/31/10  
NIH/NIMH \$417,000  
Amygdala Function in Children and Adolescents with Fragile X Syndrome  
The goal of the project is to investigate molecular, neuroanatomical and functional aspects of amygdala dysfunction in child and adolescent females and high-functioning males with the fragile X full mutation.  
Role: PI

Cure Autism Now Pilot Research Study (Saron) 11/01/05-6/30/09  
**Cure Autism Now** \$120,000  
Behavioral and Brain Responses to Sensory Processing in Children with Autism Spectrum Disorders  
This project examines the behavioral (reaction time), electromyographic (EMG), and brain (EEG) responses to sensory processing in children with Autism Spectrum Disorders (ASD) as compared to typically developing (TD) children. Specifically, it examines the integration of multiple sensory systems through analysis of dense-channel array event related potentials (ERPs) elicited in response to visual, auditory, and somatosensory stimuli delivered alone or in simultaneous combination  
Role: Co-PI

Autism Speaks Mentored Research Award (Rivera) 1/1/07-12/31/08  
**Autism Speaks** \$56,000  
Biological Motion Perception in Autism: A window into social cognition deficits?  
The goal of this project is to gain new knowledge about the social deficits seen in autism by studying biological motion perception. It employs fMRI paradigms probing both biological motion and coherent motion perception, in an effort to determine to what extent these deficits can be explained primarily as a dorsal stream deficit versus deficits in higher-order social cognition areas.  
Role: PI

Pilot Grant Program (Rivera) 7/01/03-7/01/04  
**U.C. Davis M.I.N.D. Institute** \$20,000  
Do children with autism show an atypical functional neural architecture or tasks on which their performance is not impaired?  
This project investigated the neural pathogenesis of autism by using fMRI with high-functioning children with autism, and evaluating their brain activation patterns (with respect to those of matched controls) on two task domains for which no cognitive deficits exist: arithmetic reasoning, and simple response inhibition.  
Role: PI

Investigator Initiated Award (Saron) 07/01/04 – 07/01/06  
**U.C. Davis M.I.N.D. Institute** \$60,000  
Brain Dynamics of Simple Multisensory Integration in Autism Spectrum Disorders.  
This project investigated the brain regions involved in multisensory integration in typically developing (TD) children and children with autism spectrum disorders (ASD).  
Role: Co-PI

Grant to Promote Extramural Funding (Rivera) 07/01/05-9/30/06  
**U.C. Davis Committee on Research** \$46,000  
Sensory, social, and emotional processing in infants with fragile X Syndrome  
This grant provided support to gather data needed to apply for an NIH R01 award for a prospective, longitudinal study to elucidate early visual processing differences in infants with fragile X Syndrome. The study probed how abnormal visual processing, if present, relates to cognitive deficits known to emerge in early childhood.  
Role: PI

Pilot Grant Program (Rivera) 01/01/06-12/31/06  
**U.C. Davis M.I.N.D. Institute** \$25,000  
Biological Motion Perception in Autism: A window into social cognition deficits?  
The goal of this project is to gain new knowledge about the social deficits seen in autism by studying biological motion perception. It employs fMRI paradigms probing both biological motion and coherent motion perception, in an effort to determine to what extent these deficits can be explained primarily as a dorsal stream deficit and to what extent they may be the result of deficits in higher-order social cognition areas.  
Role: PI

## Training Grants

### Active

Interdisciplinary Training for Autism Researchers  
PI: Rogers, S.L., Ph.D.  
Faculty trainer, S.M. Rivera  
NIH 1T32MH073124

Learning, Memory, and Plasticity (LaMP) Training Program  
PI: McAllister, K., Ph.D.  
Faculty trainer, S.M. Rivera  
NIH 1T32MH112507

Training Program in Basic Neuroscience

PI: Usrey, W.M., PhD.  
Preceptor, S.M. Rivera  
NIH 5T32MH082174

Advancing Diversity in Neuroscience Research (ADNR)

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