Joseph M. Baker, Ph.D.

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Center for Interdisciplinary Brain Sciences Research
401 Quarry Rd., MC 5795
Stanford, CA 94305

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CIBSR Lab:
http://cibsr.stanford.edu/

ACADEMIC APPOINTMENTS

2013 - Present — Postdoctoral Fellow, Center for Interdisciplinary Brain Sciences Research, Stanford University School of Medicine, Stanford, CA

Faculty Sponsor: Dr. Allan Reiss

EDUCATION

2008 – 2013 — Utah State University

Ph.D., Cognitive Psychology, 2013

Dissertation Chair: Dr. Kerry E. Jordan

2005 – 2008 — Middle Tennessee State University

M.A., Cognitive Psychology

Thesis Chair: Dr. Stephen Schmidt

2000 – 2005 — New Mexico State University

B.A., Experimental Psychology

HONORS & AWARDS

2013 — Stanford University School of Medicine, Center for Cognitive Neurobiological Imaging, Seed Grant ($5,040).

2013 — Utah State University Open Access Funding Initiative Award ($1,268.45)

2013 — NIH Conference on the Evolutionary Precursors and Early Development of Basic Number Processing, Travel Award ($1,000).

2013-2014 — Doctoral researcher ($20,000). *Captivated! Young children's learning interactions with iPad mathematics apps*. 2013-14. Utah State University, Vice President for Research RC Funding. Project goal: build theory and knowledge about the nature of young children's ways of thinking and interacting with virtual manipulatives using touch-screen mathematics apps on the iPad (with Principal Investigator Patricia Moyer-Packenham, Co-PI Cathy Maahs-Fladung, and the Virtual Manipulative Research Group). My role: Statistical analysis and visualization of quantitative and

	qualitative data, conduct iPad-based interviews with participants, observe and code participant actions, and coding of data.
2012-2013	Utah State University Dissertation Fellowship ($5,000)
2011	Intermountain Graduate Research Symposium Lecture Presentation Competition, Second Place
2011-2012	Graduate Research Assistant ($35,000). *Virtual Manipulatives Research Group: Effects of Multiple Visual Modalities of Representation on Rational Number Competence*. 2011-12. Utah State University, Vice President for Research SPARC Funding. Lead PI- Patricia Moyer-Packenham; Collaborating Faculty—Kerry Jordan, Dicky Ng, and Kady Schneiter; My role: Conduct data collection and analysis, participate in research team meetings, collaborate on publications and presentations focusing on using virtual manipulatives to teach rational number concepts.
2010	Conference Travel Fellowship, Utah State University
2010	Intermountain Graduate Research Symposium Lecture Presentation Competition, First Place
2010	Walter R. Borg Scholarship and Research Productivity Award, Utah State University, Department of Psychology
2008	Conference Travel Fellowship, Utah State University
2007	Robert E. Prytulla Scholarship for Excellence in Psychological Studies, Middle Tennessee State University, Department of Psychology
2007	Research Travel Grant, Middle Tennessee State University

PUBLISHED PEER-REVIEWED MANUSCRIPTS

Baker, J. M., Aghababyan, A., Gillam, R., & Martin, T. (In press). Cortical activations during a computer-based fraction learning game: Preliminary results from a pilot study. *Journal of Technology, Knowledge, and Learning*, doi: 10/1007/s10758-015-9251-y

Cui, X.*, **Baker, J. M.***, Liu, N.*, & Reiss, A. L. (In press). Sensitivity of fNIRS measurement to head motion: An applied use of smartphones in the lab. *Journal of Neuroscience Methods*, doi: 10.1016/j.jneumeth.2015.02.006.

Maclean, E. L., Hare, B., Nunn, C. L., Addessi, E., Amici, F., Anderson, R. C., Aureli, F., **Baker, J. M.**, Bania, A. E., Barnard, A. M., Boogert, N. J., Brannon, E. M., Bray, E. E., Brent, L. J., Burkart, J. M., Call, J., Cantlon, J. F., Cheke, L. G., Clayton, N. S., Delgado, M. M., DiVincenti, L. J., Fujita, K., Herrmann, E., Hiramatsu, C., Jacobs, L. F., Jordan, K. E., Laude, J. R., Leimgruber, K. L., Messer, E. J., Moura, A. C., Ostojić, L., Picard, A., Platt, M. L., Plotnik, J. M., Range, F., Reader, S. M., Reddy, R. B., Sandel, A. A., Santos, L. R., Schumann, K., Seed, A. M., Sewall, K. B., Shaw, R. C., Slocombe, K. E., Takimoto, A., Tan, J., Tao, R., van Schaik, C. P., Virányi, Z., Visalberghi, E., Wade, J. C., Wantanabe, A., Widness, J., Young, J. K., Zentall, T. R., Zhao, Y. (2014). The evolution of self-control. *Proceedings of the National Academy of Sciences, 111*(20), E2140-E2148, doi: 10.1073/pnas.1323533111.

Mahamane, S.*, Grunig, K. L.*, **Baker, J. M.**, Young, J., & Jordan, K. E. (2014). Memory-based quantity discrimination in coyotes (*Canis latrans*). *Animal Behavior and Cognition,* DOI: 10.12966/abc.08.09.2014.

Baker, J. M., Mahamane, S., & Jordan, K. E. (2014). Multiple visual quantitative cues enhance discrimination in infancy. *Journal of Experimental Child Psychology, 122*, 21-32, doi: 10.1016/j.jecp.2013.12.007.

Moyer-Packenham, P., **Baker, J. M.**, Westenskow, A., Anderson, K., Shumway, J. F., & Jordan, K. E. (2014). Predictors of achievement when virtual manipulatives are used for mathematics instruction. *REDIMAT- Journal of Research in Mathematics Education, 3*(2), 121-150. doi: 10.4471/redimat.2014.46.

Moyer-Packenham, P., **Baker, J. M.**, Westenskow, A., Rodzon, K., Anderson, K., Shumway, J., & Jordan, K. (2013). A study comparing virtual manipulatives with other instructional treatments in third- and fourth-grade classrooms. *Journal of Education, 193*(2), 25-39.

Baker, J. M., Rodzon, K. S., & Jordan, K. E. (2013). The impact of emotion on visual numerical estimation. *Frontiers in Cognition*, 1, doi: 10.3389/fpsyg.2013.00521.

Baker, J. M., Morath, J., Rodzon, K. S., & Jordan, K. E. (2012). A shared system of representation governing quantity discrimination in canids. *Frontiers in Psychology, 3*, 387**,** doi: 10.3389/fpsyg.2012.00387.

Baker, J. M., Shivik, J., & Jordan, K. E. (2011). Tracking of food quantity by coyotes (*Canis Latrans*). *Behavioral Processes, 88*, 72-75, doi: 10.1016/j.beproc.2011.08.006.

Jordan, K. & **Baker, J.M.** (2011). Multisensory information boosts numerical matching abilities in young children. *Developmental Science,* 14(2), 205-213.

BOOK CHAPTERS

Baker, J.M., & Jordan, K.E. (2015). The influence of multisensory cues on representation of quantity in children. *Math Cognition Vol. 1: Evolutionary Origins and Early Development of Basic Number Processing*, Eds., D. Geary, D. Berch, K. M. Koepke. Elsevier.

PUBLISHED PEER-REVIEWED CONFERENCE PROCEEDINGS

Moyer-Packenham, P.S., Anderson, K.L., Shumway, J.F., Tucker, S., Westenskow, A., Boyer-Thurgood, J., Bullock, E., Mahamane, S., **Baker, J.M.**, Gulkilik, H., Maahs-Fladung, C., Symanzik, J., & Jordan, K.E. (2013). Developing research tools for young children's interactions with mathematics apps on the iPad. Published in the *Proceedings of the 12th Annual Hawaii International Conference on Education (HICE)*, (pp. 1685-1694), Honolulu, Hawaii, ISSN# 1541-5880.

Clark, D., **Baker, J. M.**, & Jordan, K. E. (2012). Salience of race vs. gender to children and adults. Published in the *Proceedings of the National Conference on Undergraduate Research (NCUR)*, 980-986.

Rodzon, K. S., **Baker, J. M.**, & Jordan, K. E. (2011). The impact of emotion on numerical estimation. Published in the *Proceedings of the Cognitive Science Society*, 3552-3557.

Baker, J. M., Feigleson, J. M., & Jordan, K. E. (2010). Multiple visual cues enhance quantitative perception in infancy. Published in the *Proceedings of the Cognitive Science Society*, 2799-2803.

MANUSCRIPTS UNDER REVIEW/REVISION/IN PREPARATION

Baker, J. M., & Reiss, A. L. (Under review). A meta-analysis of math performance in Turner syndrome. Submitted to *Journal of Clinical Endocrinology and Metabolism*, October 2014.

Shumway, J. F., **Baker, J. M.**, Moyer-Packenham, P. S., Westenskow, A., Anderson-Pence, K. L., Tucker, S. I., Boyer-Thurgood, J., & Jordan, K. E. (Under review). Using open-response fraction problems to understand the relationship between instructional modalities and students' solution strategies. Submitted to *Mathematical Thinking and Learning*, May 2014.

Liu, N.*, **Baker, J. M.***, Vrticka, P., Saggar, M., & Reiss, A. L. (In preparation). The role of gender on inter-brain coherence identified by fNIRS-based hyperscanning.

Baker, J. M., Gillam, R., & Jordan, K. E. (In preparation). Concurrent neural and behavioral responses to number line estimations in children and adults.

Campbell, B., Kynaston, B., Loosle, B., **Baker, J. M.**, Jordan, K. E., & Tschanz, J. T. (In preparation). Cognitive impairment and mental representation of numerical quantity in the elderly.

Baker, J. M., & Schmidt, S. (In preparation). Naughty words: The influence of taboo words on cognition.

Baker, J. M., Rodzon, K. S., Shumway, J., Ng, D., Moyer-Packenham, P., & Jordan, K. (In preparation). Visual vs. symbolic part-whole understanding in fraction learning.

Jordan, K. E., **Baker, J. M.**, & Mitroff, S. (In preparation). The sensitive geek: Enhanced matching of numerosity in videogamers.

* Indicates co-first-authorship

PROFESSIONAL PRESENTATIONS & INVITED LECTURES

Liu, N., **Baker, J. M.**, Cui, X., Vrticka, P., Saggar, M., & Reiss, A. L. (2014, November). NIRS-based hyperscanning reveals sex differences in brain synchronization during cooperation and competition. Poster to be presented at the Society for Neuroscience Annual Conference, Washington, D. C.

Saggar, M., Schreier, M., **Baker, J. M.**, & Reiss, A. L. (2014, November). Creativity and brain development: Using functional near-infrared spectroscopy to investigate the neural correlates of middle childhood "slump" in creativity. Poster to be presented at the Society for Neuroscience Annual Conference, Washington, D. C.

Baker, J.M. (2014, July). Behavioral and neural correlates to number knowledge. Invited talk, Stanford University School of Medicine's Center for Interdisciplinary Brain Sciences Research Summer Lecture Series.

Baker, J. M., Reiss, A. L. (2014, June). A meta-analysis of math performance in Turner syndrome. Invited talk, Lucille Packard Children's Hospital Turner Syndrome Information Day, Stanford University School of Medicine.

Aghababyan, A., **Baker, J. M.**, & Martin, T. (2014, April). Students' neurological response patterns while playing math games. Poster presented at the American Educational Research Association Annual Conference, Philadelphia, PA.

Baker, J. M. (2014, January). On the topographic representation of numerosity in the human parietal cortex. Invited lecture, Center for Interdisciplinary Brain Sciences Research Postdoctoral Luncheon Symposium, Stanford University School of Medicine.

Baker, J. M., & Jordan, K. E. (2013, May). *Concurrent neurological and behavioral assessment of number line estimation performance in early math learners*. Poster presented at the NIH Conference on the Evolutionary Precursors and Early Development of Basic Number Processing, Washington, D.C.

Baker, J. M., & Jordan, K. E. (2013, April). *NIRS based neurological assessment of number line estimation performance in children and adults*. Talk given at the annual Intermountain Graduate Research Symposium, Logan, UT.

Baker, J. M., Jordan, K. E. (2013, January). *Multiple cues enhance quantitative discrimination in infancy*. Talk given at the annual Interdisciplinary Conference, Jackson Hole, WY.

Baker, J. M. (2012, October). *Data visualization and management techniques: Approaches using Mondrian and Excel*. Invited lecture, Graduate Student Seminar, Department of Special Education, Utah State University.

Baker, J. M., Jenkins, S., Friedel, J., & Jordan, K. E. (2012, April). *The effect of scale on number line estimations*. Talk given at the annual Intermountain Graduate Research Symposium, Logan, UT.

Moyer-Packenham, P., Jordan, K. E., Ng, D., Anderson, K., **Baker, J. M.**, Rodzon, K., Shumway, J., & Westenskow, A. (2011, October). *School mathematics research on virtual manipulatives: A collaborative team approach*. Talk given at the annual meeting of the School Science & Math Association, Colorado Springs, CO.

Baker, J. M., & Jordan, K. E. (2011, October). *The effect of intrasensory stimulation on infants' quantitative discrimination*. Poster presented at the biennial meeting of the Cognitive Development Society, Philadelphia, PA.

Rodzon, K., **Baker, J. M.**, Jordan, K. E. (2011, July). *Impact of emotion on numerical estimation*. Talk given at the annual Cognitive Society Society, Boston, MA.

Baker, J. M., & Jordan, K. E. (2011, June). Investigating the effects of multisensory stimulation on numerical cognition. Invited lecture, Family Consumer and Human Development Honors, USU, Logan, UT.

Baker, J. M., Thrailkill, E., & Shahan, T. (2011, April). *Allocation of unconscious visual attention and the matching law*. Talk given at the annual Intermountain Graduate Research Symposium, Logan, UT.

Baker, J. M., Feigleson, J., & Jordan, K. E. (2010, August). *Multiple visual cues enhance quantitative perception in infancy*. Talk given at the annual conference of the Cognitive Science Society, Portland, OR.

Jordan, K. E., **Baker, J. M.**, & Rodzon, K. S. (2010, August). *Multisensory information improve numerical matching abilities in preschool children*. Poster presented at the annual conference of the Cognitive Science Society, Portland, OR.

Jordan, K. E., **Baker, J. M.** (2010, July). *Multisensory stimuli enhance numerical abilities of preschool children*. Poster presented at the annual conference of the International Society for the Study of Behavioral Development, Lusaka, Zambia.

Jordan, K. E., **Baker, J. M.**, & Rodzon, K. S. (2010, May). *Tracking of food quantity by coyotes* (*Canis Latrans*). Poster presented at the annual meeting of the Visual Sciences Society, Naples, FL.

Baker, J. M., Rodzon, K. S., Shivik, J., & Jordan, K. E. (2010, April). *Numerical discrimination abilities in coyotes* (*Canis Latrans*). Talk given at the annual conference of the Utah Academy of Sciences, Arts, and Letters, St. George, UT.

Baker, J. M., & Jordan, K. E. (2010, April). *Multisensory redundancy and numerical discrimination abilities in infancy*. Invited lecture, Research Methods, USU, Logan, UT.

Baker, J. M., & Jordan, K. E. (2010, March). *Intrasensory cues enhance quantitative perception in infancy*. Talk given at the annual Intermountain Graduate Research Symposium, Logan, UT.

Jordan, K. E., & **Baker, J. M.** (2010, March). *Redundant visual cues amplify preverbal quantitative skills*. Poster presented the Biennial Meeting of the International Society on Infant Studies, Baltimore, MD.

Baker, J. M. (2010, March). *Improving quantitative competence in infancy and early childhood*. Invited lecture, Cognition & Instruction, Utah State University, Logan, UT.

Jordan, K. E., & **Baker, J. M.** (2009, October). *Does multisensory information improve matching of large numerosities in young children?* Poster presented at the Annual Meeting of the Cognitive Development Society, Chicago, IL.

Baker, J. M., & Jordan, K. E. (2009, April). *Multisensory information boosts numerical matching abilities in pre-school children*. Poster presented at the Biannual Meeting of the Society for Research in Child Development, Denver, Co.

Baker, J. M., & Jordan, K. E. (2008, October). *Multisensory information boosts numerical matching abilities in young children*. Round-table discussion presented at the Annual Meeting of the Northern Rocky Mountain Education Research Association, South Lake Tahoe, NV.

Baker, J.M., & Schmidt, S. (2007, November). *A word choice: The effect of emotion on lexical decision and accuracy*. Poster session presented at the Annual Meeting of the Psychonomics Society, Long Beach, CA.

Baker, J.M., & Schmidt, S. (2006, November). *Lexical pop-out: The effect of emotion on automatic attention to words*. Poster session presented at the Annual Meeting of the Psychonomics Society, Houston, TX.

PRESS COVERAGE

2014 Coverage of my paper in *Proceedings of the National Academy of Sciences, USA*

National Geographic- Phenomena, "This is how you study the evolution of animal intelligence"

http://phenomena.nationalgeographic.com/2014/04/22/this-is-how-you-study-the-evolution-of-animal-intelligence/

Science Daily- Featured Research, "Brain size matters when it comes to animal self-control"

http://www.sciencedaily.com/releases/2014/04/140422113437.htm

2013 Coverage of my paper in *Frontiers in Cognition*:

Utah State Today- University News, "USU research on the effect of emotion yields unexpected results"

http://www.usu.edu/ust/index.cfm?article=52730

2011 Coverage of my paper in *Frontiers in Psychology*:

Utah State Today- University News, "USU researcher finds coyotes possess rudimentary quantitative abilities"

http://www.usu.edu/ust/index.cfm?article=50261

MENTORSHIP

Stanford University:

Stanford Institutes of Medicine Summer Research (SIMR) Program Mentor, 2014, Mentee: Mallory Shingle. Project poster: Shingle, M., **Baker, J. M.**, & Reiss, A. L. (2014). Can I get your number? Neural activation during abstract number processing. Poster presented at the SIMR Poster Session, Stanford University, Stanford, CA.

Utah State University:

Campbell, B., Kynaston, B., Loosle, B., **Baker, J. M.**, Jordan, K. E., & Tschanze, J. T. (2014, April). Cognitive impairment and mental representation of numerical quantity in the elderly. Poster to be presented at the annual meeting of the Rocky Mountain Psychological Association, Salt Lack City, UT.

Zobell, C.J., Anderson, A.J., Snow, J., Cooper, J., Johnson, B., **Baker, J.M.**, & Bates, S.C. (2013, April). Subjective well-being and working memory as predictors for sales success. Poster presented at the Westeron Psychological Association Conference, Reno, NV.

Jenkins, S., **Baker, J. M.**, Friedel, J., & Jordan, K. E. (2012, April). *Incomplete understanding of large scale numbers in adults*. Poster presented at the annual Intermountain Undergraduate Research Symposium, Logan, UT.

Clark, D., **Baker, J. M.**, & Jordan, K. E. (2012, March). *Salience of race vs. gender to children and adults*. Poster presented at the National Conference for Undergraduate Research, Ogden, UT.

Clark, D., **Baker, J. M.**, & Jordan, K. E. (2012, January). *Salience of race vs. gender to children and adults*. Poster presented at the Research on Capitol Hill Undergraduate Research Conference, Salt Lake City, UT.

Attwood, N., **Baker, J. M.**, & Jordan, K. E. (2011, April). *Attention restorative effects of differing environments*. Poster presented at the annual meeting to the Rocky Mountain Psychological Association, Salt Lake City, UT.

Feigleson, J., **Baker, J. M.**, & Jordan, K. E. (2010, April). *Attention to social categories across infant development*. Poster presented at the Utah Academy of Sciences, Arts, and Letters, St. George, UT.

Feigleson, J., **Baker, J. M.**, & Jordan, K. E. (2010, March). *Attention to social categories in infants*. Poster presented at the Utah State University Undergraduate Research Symposium, Logan, UT.

TEACHING EXPERIENCE

Graduate Level:

Research Design & Analysis (Psy./Educ. 6600), Instructor of Record, USU:

Fall, 2010

Summer, 2010

Spring, 2009

Research Design & Analysis II (Psy./Educ. 7610), Supplemental Instructor, USU:

Spring, 2011

Fall, 2010

Undergraduate Level:

Introduction to Psychology (Psy. 1010), Instructor of Record, USU:

Spring, 2012

Fall, 2011

Fall, 2010

Perception & Psychophysics (Psy. 3450), Instructor of Record, USU:

Spring, 2011 (online)

Fall, 2010 (online)

Summer, 2010 (online)

Spring, 2010 (online)

Fall, 2009

Cognitive Psychology (Psy. 4420), Instructor of Record, USU:

Spring, 2011

SERVICE TO PROFESSION

Reviewer, The Psychological Record, 2014-present

Reviewer, Cognitive Development Society Annual Conference, 2011-present

Reviewer, Cognitive Science Society Annual Conference, 2010-present

APPOINTED & ELECTED POSITIONS

Chairman, Stanford Postdoc Initiative Fund (SPIF) committee, Stanford University, 2013 – present

Council Member, Stanford University Postdoctoral Association (SURPAS), Stanford University, 2013 - present

Virtual manipulative research group NIRS methodologist and statistician, Utah State University, 2011 – present

Experimental & Applied Psychological Sciences Student Representative, Utah State University, 2008 – 2009

Assistant to Chief Compliance Officer, Middle Tennessee State University, 2006 – 2008

Vice President, Psi Chi, NMSU Chapter, 2004

Public Relations Executive, Psi Chi, NMSU Chapter, 2003-2004

PROFESSIONAL AFFILIATIONS

American Psychological Association (2014 – Present)

Cognitive Development Society (2011 – Present)

Vision Science Society Member (2010 – Present)

Sigma Xi Scientific Research Society Member (2010 – Present)

APA Student Affiliate (2008 – 2013)

Society for Research in Child Development, Graduate Student Member (2008 – 2013)

Psi Chi, New Mexico State University Chapter (2001-Present)

PROGRAMMING AND TECHNICAL PROFICIENCY

Hitachi ETG-4000 Near-Infrared Spectroscopy

NIRX NIRSport Near-Infrared Spectroscopy

G. E. Healthcare whole-body MR system

E-Prime Psychological Software

Matlab

R

SPSS

AMOS

REFERENCES

Dr. Allan Reiss

Howard C. Robbins Professor of Psychiatry and Behavioral Sciences, Professor of Radiology, and Director of the Center for Interdisciplinary Brain Sciences Research

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Dr. Kerry Jordan

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Emma Eccles Jones Education Building, 487

Logan, UT 84322

Tel: (435) 797-2797

Email: Kerry.Jordan@usu.edu

Dr. Ronald Gillam

Professor, Utah State University Ray L. and Eloise Hoopes Lillywhite Endowed Chair in Speech-Language Pathology

Early Childhood Education & Research Center, 224

Logan, UT 84322

Tel: (435) 797-1704

Email: Ron.Gillam@usu.edu