

Sarah R. Allred

Curriculum Vitae



Contact Information

Senator Walter Rand Institute for Public Affairs Office: (856) 225-6268
Rutgers–Camden Cell: (267) 795-8816
411 Cooper Street srallred@camden.rutgers.edu
Camden, NJ 08102 <http://allred.rutgers.edu>

Academic Positions

2017- Faculty Director, Walter Rand Institute for Public Affairs, Rutgers-Camden
2016- Associate Chair, Psychology, Rutgers-Camden
2016- Associate Professor, Psychology, Rutgers-Camden
2009-2016 Assistant Professor, Psychology, Rutgers-Camden
2006-2009 Postdoctoral Researcher, Psychology, University of Pennsylvania, with David Brainard.

Education

2006 Ph.D., Neurobiology and Behavior, University of Washington. Dissertation: *The neural basis of visual object perception*. Lab of Bharathi Jagadeesh.
1999 B.S., Applied Physics: Neuroscience Emphasis, Minors: Mathematics, Philosophy, Brigham Young University.

Grant Support - Academic

2019-2020 Research grant from County Health Rankings and Roadmaps, a collaboration of the University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation. Title: Peer-County Bayesian Estimation for County Health Rankings & Roadmaps. Award to Sarah Allred, Principal Investigator \$50,000.
2010-2018 NSF CAREER Award: Novel Approaches to Integrating Color Perception and Color Memory. Award to Sarah Allred, Principal Investigator. NSF-BCS 0954749. \$ 487,155.

Grant and Contract Support - Service and Training

2019-2020 *Small Communities Forging Hyperlocal Data Collaboratives* Grant from Robert Wood Johnson Foundation to New Jersey Health Initiatives, with associated grant through WRI to Sarah Allred, Project Director. \$99,349
2018-2019 Community Health Needs Assessments in Burlington, Camden and Gloucester Counties. Contracts through South Jersey Health Collaborative, including Virtua, Lourdes, Jefferson-New Jersey, and Cooper Health. Contract through WRI with Sarah Allred as Principal Investigator. \$174,168.
2018-2019 Community Design for Health and Wellness Interdisciplinary Research Grant from the Office of Research and Economic Development at Rutgers. Grant to support pilot projects with award decisions made through Sarah Allred and Mark Aakhus (School of Communication, Rutgers, New Brunswick) as co-Directors. \$200,000

- 2018 Community Health Needs Assessment in Gloucester, Cumberland and Salem Counties for Inspira Health Network. Contract through Walter Rand Institute, with Sarah Allred as Principal Investigator. \$75,000
- 2018-2019 Conference and Symposium Grant for Data for Population Health. Grant to organize conference. Grant is to Sarah Allred, Principal Investigator, with Jeanne Garmon, Research Coordinator.

Professional Service

- 2020 Member, New Jersey Behavioral Risk Factor Survey Advisory Committee, a nine-member committee that will work with the New Jersey Department of Health on revisions to the current survey.
- 2019 Organizer, *Leveraging Data for Population Health: Academic and Community Partnerships*, a two-day symposium at Rutgers-Camden
- 2016/7 Abstract Review Board, Vision Sciences Society
- 2015 Guest Editor, Journal of Vision special issue on "the dress"
- 2013 Organizer, *Does appearance matter?*, a Vision Sciences Society Symposium
- 2009 Co-organizer, with Gary Hatfield (University of Pennsylvania), Institute for Research on Cognitive Science interdisciplinary workshop on cognitive and developmental factors in perceptual constancy

Community-facing Publications

- 2019 [South Jersey Health Needs: Connection, Community and Care.](#)
- 2019 [Community Health Needs Assessment](#) Prepared for the South Jersey Health Collaborative, for Burlington, Camden, and Gloucester Counties.
- 2018 [Community Health Needs Assessment](#) Prepared for Inspira Health Network, for Gloucester, Cumberland, and Salem Counties.

Peer-Reviewed Publications

- Olkkonen, M., Saarela, T.P. and **Allred, Sarah R.** (2016). Perception-memory interactions reveal a computational strategy for perceptual constancy. *Journal of Vision*, 16(3):38. doi: 10.1167/16.3.38. [PDF](#)
- Allred, S.R.**, Duffy, E.S., and Smith, J. (2016). Cognitive load and strategic sophistication. *Journal of Economic Behavior & Organization*, 125, 162-178. [PDF](#)
- Allred, S.R.**, Crawford, L. E., Duffy, E.S., and Smith, J. (2016). Working memory and spatial judgments: Cognitive load increases the central tendency bias. *Psychonomic Bulletin & Review* doi:10.3758/s13423-016-1039-0 [PDF](#)
- Bae, G. Y., Olkkonen, M., **Allred, S.R.** and Flombaum, J. I. (2015). Why some colors appear more memorable than others: A model combining categories and particulars in color working memory. *Journal of Experimental Psychology: General*. doi:10.1037/xge0000076. [PDF](#)
- Allred, S. R.** and Olkkonen, M. (2015). The effect of memory and context changes on color matches to real objects. *Attention, Perception & Psychophysics*. doi:10.3758/s13414-014-0810-4. [PDF](#)
- Allred, S. R.** and Flombaum, J. I. (2014). Relating color working memory and color perception. *Trends in Cognitive Science*, 18, 562-5. doi:10.1016/j.tics.2014.06.002. [PDF](#)

- Olkkonen, M., McCarthy, P. and **Allred, S.R.** (2014). The central tendency bias in color perception: effects of internal and external noise. *Journal of Vision*, 14(11):5. doi:10.1167/14.11.5. [PDF](#)
- Bae, G. Y., Olkkonen, M., **Allred, S. R.**, Wilson, C., and Flombaum, J. I. (2014). Stimulus specific variability in color working memory with delayed estimation. *Journal of Vision*, 14(4):7. doi:10.1167/14.4.7 [PDF](#)
- Olkkonen, M. and **Allred, S. R.** (2014). Short-term memory affects color perception in context. *PLoS ONE* 9(1): e86488. [PDF](#)
- Allred, S. R.** and Olkkonen, M. (2013). The effect of background and illumination on color identification of real, 3D objects. *Frontiers in Psychology*, 4:821. doi:10.3389/fpsyg.00821 [PDF](#)
- Allred, S. R.**, and Brainard, D.H. (2013). A Bayesian model of lightness perception that incorporates spatial variation in the illumination. *Journal of Vision*, 13(7):18. doi:10.1167/13.7.18 [PDF](#)
- Allred, S.R.**, Radonjić, A., Gilchrist, A., and Brainard, D.H. (2012). Lightness perception in high-dynamic range images: local and remote luminance effects. *Journal of Vision*, 12(2):17. doi:10.1167/12.2.7 [PDF](#)
- Radonjić, A., **Allred, S.R.**, Gilchrist, A., and Brainard, D.H. (2011). The dynamic range of human lightness perception. *Current Biology*, 21(22), 1931-6. doi:10.1016/j.cub.2011.10.013. [PDF](#)
- Allred, S.R.**, Brainard, D.H. (2009). Contrast, constancy, and measurements of perceived lightness under parametric manipulation of surface slant and surface reflectance. *Journal of the Optical Society of America A*, 26(4), 949-961. doi: 102157 [PDF](#)
- Allred, S. R.**, Jagadeesh, B. (2007). Quantitative comparison between neural response in macaque inferotemporal cortex and behavioral discrimination of photographic images. *Journal of Neurophysiology*, 98: 1263-1277. doi:10.1152/jn.00016.2007. [PDF](#)
- Allred, S.R.**, Liu, Y., and Jagadeesh, B. (2005). Selectivity of inferior temporal neurons for realistic pictures predicted by algorithms for image database navigation. *Journal of Neurophysiology*, 94:4068-4081. doi:10.1152/jn.00130.2005. [PDF](#)

Books and Chapters

- Hatfield, G. and **Allred, S. R.** (Eds.) (2012). *Visual experience: Sensation, cognition and constancy*. Oxford, UK: Oxford University Press.
- Allred, S. R.** (2012). Approaching color with Bayesian algorithms. In G. Hatfield & **S. R. Allred** (Eds.), *Visual experience: Sensation, cognition, and constancy* (pp. 212-231). Oxford: UK, Oxford University Press.
- Hatfield, G. and **Allred, S. R.** (2012). Introduction: Visual experience. In G. Hatfield & **S. R. Allred** (Eds.), *Visual experience: Sensation, cognition, and constancy* (pp. 1-10). Oxford: UK, Oxford University Press.

Honors and Awards

2017	Open and Affordable Textbook Grant Award, Rutgers
2016	Presidential Award for Excellence in Teaching, Rutgers, New Brunswick
2015	Chancellor's Teaching Award, Rutgers-Camden
2014	Rutgers University Digital Teaching Fellow
2001-2004	Vision Training Grant. NEI-UW. Tuition and stipend
1999-2001	ARCS Graduate Fellowship. Seattle, WA. University of Washington
1996-1999	Department of Physics Dean's List. Brigham Young University

1995-1999	Howard W. Hunter Presidential Scholar. Tuition and stipend. Brigham Young University
1995-1999	IBM Thomas J. Watson Scholarship
1995	National Merit Semi-Finalist

Conference Presentations

Allred, S.R., Collins, D., Curtis, C., Gomez, J., Jackson, J., Park, S., Rumer, J., and Wang, H. (2017). How robust are color-specific biases in memory? Vision Sciences Society, May 2017, St Pete's Beach, FL.

Sims, C.R., Ma, Z., **Allred, S.R.**, Lerch, R.A., and Flombaum, J.I. (2016). Exploring the Cost Function in Color Perception and Memory: An Information-Theoretic Model of Categorical Effects in Color Matching. Cognitive Sciences, August 11-13, Philadelphia, PA.

Allred, S.R., Bae, G.Y, Olkkonen, M., and Flombaum, J.I. (2015). A new model for the contents of visual working memory, Vision Sciences Society, May 15-20, St Pete's Beach, FL.

Olkkonen, M., Saarela, T., and **Allred, S.R.** (2014). Probabilistic estimation of surface lightness. OSA Fall Vision Meeting, October 10-12, Philadelphia, PA.

Olkkonen, M., Saarela, T., and **Allred, S.R.** (2014). The role of memory in surface color perception. European Conference on Visual Perception, August 24-28, Belgrade, Serbia.

Bae, G. Y., Olkkonen, M., **Allred, S. R.**, Wilson, C., and Flombaum, J. I. (2014). Models of color working memory with color perception as a variable. Vision Sciences Society, May 16-21, St Pete's Beach, FL.

Olkkonen, M., McCarthy, P. and **Allred, S.R.** (2014). Biases in perceived color are related to threshold increases for external, but not internal noise manipulations. Vision Sciences Society, May 16-21, St Pete's Beach, FL.

McCarthy, P., Olkkonen, M. and **Allred, S.R.** (2013). Color constancy and palette complexity in real scenes. Vision Sciences Society, May 10-15, St Pete's Beach, FL.

Olkkonen, M. and **Allred, S.R.** (2013). Effect of short-term memory on perceived hue. Vision Sciences Society, May 10-15, Naples, FL.

Iannetti, N.A. and **Allred, S.R.** (2013). Comparing memory for colored patches, image textures, and photographs. Vision Science Society, May 10-15, Naples, FL.

McLaren, J., Bell, J.R. and **Allred, S.R.** (2013). Remembering colors: Bias and variability. Vision Science Society, May 10-15, Naples, FL.

Olkkonen, M. **Allred, S.R.** (2012). Relationship between constancy and memory for stimulus hue and lightness. 35th European Conference on Visual Perception Alghero, Italy, September 2-6, *Perception*, 41, 45-45.

Olkkonen, M., **Allred, S.R.** (2012). Bias and precision in the perception and memory for stimulus lightness. Vision Sciences Society, May 11-16, Naples, FL. *Journal of Vision*, 12(9), 1209.

Bell, J. R., **Allred, S.R.** (2012). Color memory and perception for real illuminated objects. Vision Sciences Society, May 11-16, Naples, FL. *Journal of Vision*, 12(9): 67.

Allred, S. R., Wood, M., Gambino, A., and Brining, E. (2011). Color constancy in perception and memory for real illuminated objects. Vision Sciences Society, May 6-11, Naples, FL. *Journal of Vision*, 11(11): 381.

Radonjić, A., Gilchrist, A., **Allred, S.R.**, and Brainard, D.H. (2011). Lightness perception in high-dynamic range contexts. Vision Sciences Society, May 6-11, Naples, FL. *Journal of Vision*, 11(11): 375.

Allred, S. R., Troiani, V., Lohnas, L. J., Jiang, L., Radonjic, A., Gilchrist, A., and Brainard, D. H. (2009). An ideal observer model predicts lightness matches. Vision Sciences Society, May 8-13, Naples, FL. *Journal of Vision*, 9(8):345.

Allred, S. R., Lohnas, L. J., and Brainard, D. H. (2008). Bayesian model of lightness perception. GRC conference on sensory coding and the natural environment, July 28-Aug 1, 2008, Italy.

Allred, S. R., Lohnas, L. J., and Brainard, D. H. (2008). Bayesian model of the staircase Gelb effect. Vision Sciences Society, May 9-14, Naples, FL. *Journal of Vision*, 8(6):283.

Allred, S. R. and Brainard, D. H. (2007). Scene complexity affects lightness constancy with respect to changes in object slant and surround reflectance. OSA Fall Vision Meeting, Sept 16-19, Berkeley, CA.

Allred, S.R. and Brainard, D. H. (2007). Parametric measurements of lightness in the context of real illuminated objects. Vision Sciences Society, May 11-16, Sarasota, FL. *Journal of Vision*, 7(9):234.

Allred, S.R. and Jagadeesh, B. (2005). Selectivity of inferotemporal neurons for realistic images predicts behavioral choice. Program No. 362.7. 2005 Abstract Viewer. Washington, DC: Society for Neuroscience.

Allred, S.R. and Jagadeesh, B. (2004). Discrimination performance with realistic images is correlated with selectivity of macaque inferior temporal (IT) neurons. Program No. 751.10. 2004 Abstract Viewer. Washington, DC: Society for Neuroscience.

Liu, Y., **Allred, S.R.**, and Jagadeesh, B. (2004). Dynamics of target selection in stimulus arrays by inferotemporal (IT) neurons during presentation of static choice stimuli. Program No. 751.9. 2004 Abstract Viewer. Washington, DC: Society for Neuroscience.

Allred, S.R., Liu, Y., and Jagadeesh, B. (2004). Algorithms for image database navigation and tuning of object selective neurons in the non-human primate. In *Proceedings of the ACM SIGGRAPH 1st Symposium on Applied Graphics and Visualization*, Los Angeles, CA August 7-8.

Allred, S.R., Thompson, J. Y. S., and Jagadeesh, B. (2003). Color-based estimates of stimulus similarity predict perceptual similarity of image pairs to monkeys. *Journal of Vision*, 3(9):511a. doi:10.1167/3.9.511.

Allred, S.R., Erickson, C. A. and Jagadeesh, B. (2002). Characteristics of pictures that evoke equivalent neural responses in macaque perirhinal cortex. Program No. 160.8. 2002 Abstract Viewer. Washington, DC: Society for Neuroscience.

Chien, S. H. L. **Allred, S.R.**, Teller, D. Y., and Palmer, J. (2000). Young infants' perception of surface lightness. The XX Annual Meeting of Optical Society of America (OSA): Color and Vision Division. Providence, Rhode Island.

Invited Talks - Academic

- | | |
|------|---|
| 2017 | Keynote Speaker, Perceptual Sciences Forum, Rutgers-New Brunswick. |
| 2017 | CUNY Graduate School, (honorarium received) |
| 2013 | Johns Hopkins, Vision Sciences Colloquium |
| 2012 | University of Washington, Seattle, Seminar in Cognitive Psychology, <i>Remembering colors: Bias and variability</i> |
| 2012 | University of Chicago, Color Group, <i>Remembering colors: Bias and variability</i> |

- 2011 Rutgers University, New Brunswick, IGERT Series in Perceptual Science, *Shades of gray in high-dynamic range images*
- 2008 Invited Lecturer, IRCS Undergraduate Summer Workshop in Cognitive Science and Cognitive Neuroscience
- 2007 Rutgers University – Newark, *Contrast, constancy and perceived lightness*
- 2007 Brigham Young University, Psychology Colloquium, *Visual perception*
- 2007 University of Pennsylvania, Penn Vision Seminar, *Perception and the visual world*
- 2004 University of Washington, Neurobiology and Behavior Retreat, *Perceptual similarity and neural selectivity in extrastriate visual cortex*

Invited Talks - Community

- 2018 Health and Wellness Alliance, Gloucester County - NJ *Community Health Needs Assessment, 2019-2020-2021*
- 2018 Health and Wellness Alliance, Salem County - NJ *Community Health Needs Assessment, 2019-2020-2021*
- 2018 Health and Wellness Alliance, Cumberland County - NJ *Community Health Needs Assessment, 2019-2020-2021*

Teaching Experience

- 2016, 2018 Digitally Enhanced Perception (Psych 467). Rutgers–Camden
- 2018 Teaching in Psychology (Psych 702). Rutgers–Camden
- 2017 Special Topics: How We Decide (Psych 458). Rutgers-Camden
- 2015 Digitally Enhanced Experimental Psychology (Psych 381). Rutgers–Camden
- 2014 Digitally Enhanced Research Methods (Psych 256). Rutgers–Camden
- 2013, 2011 Evolutionary Psychology (Psych 677). Rutgers–Camden
- 2011 Color: Psychology, Philosophy, physics and Art (Honors 120). Rutgers–Camden
- 2012, 2010 Perception (Psych 467). Rutgers–Camden
- 2009-14 Method and Theory in Psychology (Psych 255). Rutgers–Camden
- 2010 - Thesis Research. Rutgers–Camden
- 2009 - Undergraduate Independent Study (Psych 495, 494). Rutgers–Camden
- 2009 Psychology, Philosophy and Poetry of Color (Psych 460). Rutgers–Camden
- 2008 Perception (Psych 111). University of Pennsylvania
- 2003 Co-Instructor, Seminar in Psychophysics (Psych 551), University of Washington
- 2001 Teaching Assistant, Vision (Physiology 424), University of Washington

- 1998-1999 Teaching Assistant, Electricity and Magnetism (Physics 122), Brigham Young University
- 1997 TA Lab, Mechanics, Electricity and Magnetism, Thermodynamics, Waves (Physics 121, 122, 221). Brigham Young University

Postdoctoral Associates

- 2011-2013 Maria Olkkonen

MA Students Supervised

- 2017 Cristhian Altamirano (non-thesis track)
- 2014-2016 Daniel Markoff (non-thesis track)
- 2012-2014 Patrice McCarthy (non-thesis track)
- 2012-2014 Nickolas Iannetti (non-thesis track)

MA Thesis Committees

- 2017-2018 Nicole Ferris, Rutgers-Camden
- 2016- 2017 Dillon Miller, Rutgers-Camden
- 2015-2016 Brianna Soreth, Rutgers-Camden
- 2014-2015 Arturo Calderon, Rutgers-Camden
- 2013-2014 Gianna Bowler, Rutgers-Camden
- 2012-2013 Suyeon Noh, Rutgers-Camden
- 2011-2013 Phillip Loatman, Rutgers-Camden

Undergraduate Students Supervised

- 2017 Gregory Ponce (undergraduate student, Rutgers-Camden)
- 2017 Sehwan Park (graduate student, Rutgers-Camden)
- 2017 Hechen Wang (graduate student, Rutgers-Camden)
- 2017 Jacqueline Gomez (independent study, Rutgers-Camden)
- 2016 Jameira Jackson (independent study, Rutgers-Camden)
- 2016 Christina Curtis (independent study, Rutgers-Camden)
- 2016 Dajsha Collins (independent study, Rutgers-Camden)
- 2016 Jessica Rumer (volunteer, Rutgers-Camden)
- 2016 Corey Williams (independent study, Rutgers-Camden)
- 2014 Jeremy Hausman (independent study, Rutgers-Camden)
- 2014 Diana Esparragoza (independent study, Rutgers-Camden)
- 2014 Nancy Essandoh (independent study, Rutgers-Camden)

- 2013 Jeremy Bell (Independent study, Rutgers-Camden, Dean's Undergraduate Travel Award)
- 2013 Constance Bienkowski (independent study, Rutgers-Camden)
- 2013 Patrice McCarthy (independent study, Rutgers-Camden)
- 2012 Katherine Quintero (independent study, Rutgers-Camden)
- 2012 Dana McNellis (independent study, Rutgers-Camden)
- 2012 Christina Ohlsen (independent study, Rutgers-Camden)
- 2012 Theresa Crisostomo (independent study, Rutgers-Camden)
- 2012 Jenna Cotton (Independent study, Rutgers-Camden)
- 2011 Nickolas Iannetti (independent study, Rutgers-Camden)
- 2011 Salima Mostafa (independent, study, Rutgers-Camden)
- 2011 Ashley McDonald (independent, study, Rutgers-Camden)
- 2011 Jade Iannocone (independent, study, Rutgers-Camden)
- 2011 Omayra Lambert (independent study, Rutgers-Camden)
- 2011 Christopher Taylor (summer paid student, Rutgers-Camden)
- 2011 Monica Bennett (independent study, Rutgers-Camden)
- 2010 Erin Brining (independent study, Rutgers- Camden)
- 2010 Anthony Gambino (independent study, Rutgers-Camden, Dean's Undergraduate Travel Award)
- 2010 Yvonne Pynne-Bailey (independent study, Rutgers-Camden)
- 2010 Michael Wood (independent study, Rutgers-Camden, Dean's Undergraduate Travel Award)
- 2010 Jenna Norton (independent study, Rutgers-Camden)
- 2009 Elizabeth Meegas (independent study, University of Pennsylvania, with David Brainard)
- 2008 Li Jiang (graduate rotation in neuroscience, University of Pennsylvania, with David Brainard)
- 2008 Vanessa Troiani (graduate rotation in neuroscience, University of Pennsylvania, with David Brainard)
- 2007 Lynn Lohnas (graduate rotation in neuroscience, University of Pennsylvania, with David Brainard)
- 2007 David Harwood (summer intern, University of Pennsylvania, with David Brainard)

Memberships (Past and Present)

- Society for Neuroscience
- ACM
- Vision Sciences Society

Optical Society of America

Ad hoc reviewer

Cengage Learning (textbook review)
 Developmental Science
 IOVS
 Journal of the Optical Society of America, A
 Journal of the Royal Society
 Journal of Vision
 National Science Foundation
 Netherlands Organisation for Scientific Research
 Oxford University Press
 Philosophical Psychology
 TOPOI: An International Review of Philosophy
 Transactions on Graphics
 Vision Research

Department and University Service (Rutgers - Camden)

2019	member, Committee for transition to Infosilem
2018-2019	member, Rutgers-Camden campus - wide committee on evaluating teaching effectiveness
2018-2019	Chair, Research Subcommittee of the Population Health Research Institute Committee for the Rutgers-Rowan Joint Board
2018	member, Search Committee for Dean of Arts & Sciences
2018	presenter, 2018 Faculty Research and Creative Activity Workshop
2017	presenter, 2017 Digital Teaching Fellows Workshop
2016	Faculty Advisory Council, Walter Rand Institute for Public Affairs
2016	participant, Open Textbook Network workshop
2016	presenter, 2016 Digital Teaching Fellows Workshop
2016 - 2018	A & P Committee
2016-2017	Faculty Advisory Council, 2017 eLearning Council
2015	presentation at Rutgers-Camden e-Learning Conference
2013-2017	general education committee for college, experiential learning subcommittee
2013-2016	curriculum committee
2013 -	graduate committee
2011-2012	department committee
2011	presentation at Chancellor's Faculty Research Day
2010	CCIB presentation, <i>Perception and computation</i>

- 2011 QSTEP presentation, *Color memory*
- 2009-2011 faculty senate, CCAS
- 2010 search committee, position in cognitive psychology
- 2010-2011 faculty advisor, Psi Chi Club
- 2009-2010 faculty advisor, Psychology Club

Other Experience

- 2010 Abstract committee for COSYNE (Computational and Systems Neuroscience)
- 2003 Edmonds Community College, Expanding Your Horizons. Career program for inner-city high school students
- 2002-2003 Organizing committee, "What to do with a PhD in the Biological Sciences" student-run seminar series
- 2002-2003 Mentor, Seattle Girl's School. Private middle school for inner-city girls focused on math and science
- 2002 Short course in computational neurobiology: vision at Cold Spring Harbor Laboratories
- 2000 Graduate rotation: infant lightness perception with Davida Teller, University of Washington
- 1999 Graduate rotation: computational vision with Michael Shadlen, University of Washington
- 1997-1999 Undergraduate research: neuroendocrinology with George Bloch, Brigham Young University
- 1998 Undergraduate research: thin films and x-ray diffraction with Steven Turley, Brigham Young University
- 1998 Data analyst. Western Wats Company