

STEVE W. C. CHANG

Yale University
Department of Psychology;
Department of Neuroscience;
Kavli Institute for Neuroscience
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POSITIONS

Assistant Professor
Yale University; 7/2014 - *present*
Department of Psychology;
Department of Neuroscience;
Kavli Institute for Neuroscience;
Yale Child Study Center;
Cognitive Science Program

Vernon B. Mountcastle Distinguished Fellow;
Curator-in-Chief of the John F. Fulton Collection
Olschefskie Institute for the Neurobiology of Knowledge; 2014 - *present*

Post-Doctoral Associate
Duke University; 9/2009 - 6/2014
Advisor: Dr. Michael L. Platt

Post-Doctoral Associate (*in transition*)
Washington University in St. Louis School of Medicine; 5/2009 - 7/2009
Advisor: Dr. Lawrence H. Snyder

EDUCATION

Ph.D., Neurosciences
Washington University in Saint Louis; 8/2003 - 5/2009
Thesis Advisor: **Dr. Lawrence H. Snyder**
Thesis: Sensorimotor Transformation in the Macaque Parietal Reach Region (Defense: March, 2009)
Committee: Larry Snyder, Dora Angelaki, Timothy Holy, Tom Thach, Kurt Thoroughman, Ralf Wessel, and Steven P. Wise

A.B., Psychology, *magna cum laude*
Washington University in St. Louis; 8/1999 - 5/2003

AWARDS & HONORS

- **Kavli Institute for Neuroscience Member**, Yale University School of Medicine
2017 - 2020
- NIMH Travel Award to attend the NIMH BRAINS award ceremony during the 2017 Society for Neuroscience Meeting
2017
- **Early Career Award**, Society for Social Neuroscience (S4SN)
2016
- **Kavli / National Academy of Sciences, Frontiers of Science Fellow**
2016
- **NIMH Biobehavioral Research Award for Innovative New Scientists (BRAINS)**
2016 - 2021

- Junior Faculty Fellowship, Yale University
Fall 2016 & Spring 2017
- Theresa Seessel Endowed Fellowship, Yale University
2015 - 2016
- **SFARI Investigator** (Simons Foundation Autism Research Initiative)
2015 - 2016
- **Best Poster Award** from the lab (Society for Social Neuroscience)
2015
- **Best Poster Award** from the lab (Gordon Research Conference - Amygdala)
2015
- **Alfred P. Sloan Research Fellow in Neuroscience**
2015 - 2017
- Theresa Seessel Endowed Fellowship, Yale University
2014 - 2015
- Faculty Fellowship, Jonathan Edwards College at Yale
2014 - present
- **K99/R00 Pathway to Independence Award** (NIH/NIMH)
2012 - 2017
- **Society for Neuroscience Nanosymposium abstract selected for SfN pool of newsworthy research**
2012
- NIH T32 Postdoctoral Training Grant in Fundamental & Translational Neuroscience
2011 - 2012
- **Ruth K. Broad Biomedical Research Foundation Postdoctoral Fellowship**
2010 - 2011
- **Kauffman Life Science Entrepreneur Fellowship**
2006
- **Lucille P. Markey Pathway Fellowship** in Human Pathobiology
2004 - 2006
- **John A. Stern Undergraduate Research Award** (Washington University in St. Louis)
2003
- **HHMI Undergraduate Research Fellow** (HHMI & Washington University Dept. of Biology)
2002



P A P E R S

Piva M, Zhang X, Noah A, **Chang SWC**, Hirsch J (in press) Distributed neural activity patterns during human-to-human competition. *Frontiers in Human Neuroscience*.

Barack DL, **Chang SWC**, Platt ML (2017) Posterior cingulate neurons dynamically signal decisions to disengage during foraging. *Neuron*, 96, 339-347.

Chang SWC (2017) An emerging field of primate social neurophysiology: Current developments. *eNeuro*, 4, 0295-17.2017.

Turrin C, Fagan NA, Dal Monte O, **Chang SWC** (in press) Social resource foraging is guided by the principles of the Marginal Value Theorem. *Scientific Reports*, 7, 11274.

Joiner JA, Piva M, Turrin C, **Chang SWC** (2017) Social learning through prediction error in the brain. *NPJ Science of Learning*, 2, article 8.

Dal Monte* O, Piva M*, Anderson KM, Tringides M, Holmes AJ, **Chang SWC** (2017) Oxytocin under opioid antagonism leads to supralinear enhancement of social attention. *Proceedings of National Academy of Sciences*, 114, 5247-5252.

Dal Monte* O, Piva M*, Morris JA, **Chang SW** (2016) Live interaction distinctively shapes social gaze dynamics in rhesus macaques. *Journal of Neurophysiology*, 116, 1626–1643.

Apps AJ, Rushworth MFS, **Chang SW** (2016) The anterior cingulate gyrus and social cognition: tracking the motivation of others. *Neuron*, 90, 692-707.

Chang SW, Calton JL, Lawrence BM, Dickinson AR, Snyder LH (2016) Region-specific summation patterns inform the role of cortical areas in selecting motor plans. *Cerebral Cortex*, 26, 2154 - 2166.

Chang SW, Fagan NA, Toda K, Utevsky AV, Pearson, JM, Platt ML (2015) Neural mechanisms of social decision-making in the primate amygdala. *Proceedings of National Academy of Sciences*, 112, 16012-16017.

Du E and **Chang SW** (2015) Neural components of altruistic punishment. *Frontiers in Neuroscience*, 9, Article 26.

Chang SW and Platt ML (2014) Amygdala: Eyes Wide Open. *Current Biology*, 24, R1000-10002.

Chang SW and Isoda M (2014) Toward a better understanding of social learning, social deciding, and other-regarding preferences. *Frontiers in Neuroscience* (editorial to Research Topic), 8:362.

Pedersen CA, **Chang SW** and Williams CL (2014) Evolutionary perspectives on the role of oxytocin in human social behavior, social cognition and psychopathology. *Brain Research (Special Issue: Oxytocin and Social Behavior)*, 1580, 1-7.

Chang SW and Platt ML (2014) Oxytocin and social cognition in rhesus macaques: Implications for understanding and treating human psychopathology. *Brain Research (Special Issue: Oxytocin and Social Behavior)*, 1580, 57-68.

Brent LJN, **Chang SW**, Gariépy JF, and Platt ML (2014) The neuroethology of friendship. *Annals of the New York Academy of Sciences, The Year in Cognitive Neuroscience*, 1316, 1–17.

Chang SW (2013) Coordinate transformation approach to social interactions. *Frontiers in Neuroscience*, 7, Article 147.

Gariépy JF, **Chang SW** and Platt ML (2013) Brain games: Toward a neuroecology of social behavior. Invited commentary in *Behavioral Brain Science*, 36, 424-5.

Chang SW, Brent LJN, Adams GK, Klein JT, Pearson JM, Watson KK, and Platt ML (2013) Neuroethology of primate social behavior. *Proceedings of National Academy of Sciences*, 110, 10387-10394.

Chang SW, Gariépy JF and Platt ML (2013) Neuronal reference frames for social decisions in primate frontal cortex. *Nature Neuroscience*, 16, 243–250.

Chang SW, Barack DL and Platt ML (2012) Mechanistic classification of neural circuit dysfunctions: Insights from neuroeconomics research in animals. *Biological Psychiatry*, 72, 101–106.

Chang SW and Snyder LH (2012) The representations of reach endpoints in posterior parietal cortex depend on which hand does the reaching. *Journal of Neurophysiology*, 107, 2352–2365.

Chang SW, Barter JW, Ebitz RB, Watson KK and Platt ML (2012) Inhaled oxytocin amplifies both vicarious reinforcement and self reinforcement in rhesus macaques (*Macaca mulatta*). *Proceedings of National Academy of Sciences*, 109, 959–964.

Chang SW, Winecoff AA, and Platt ML (2011) Vicarious reinforcement in rhesus macaques (*Macaca mulatta*). *Frontiers in Neuroscience*, 5, Article 27.

Chang SW and Snyder LH (2010) Idiosyncratic and systematic aspects of spatial representations in the macaque parietal cortex. *Proceedings of National Academy of Sciences*, 107, 7951–7956.

Churchland MM, Yu BM, Cunningham JP, Sugrue LP, Cohen MR, Corrado GS, Newsome WT, Clark AM, Hosseini P, Scott BB, Bradley DC, Smith MA, Kohn A, Movshon JA, Armstrong KM, Moore T, **Chang SW**, Snyder LH, Lisberger SG, Priebe NJ, Finn IM, Ferster D, Ryu, SI, Santhanam G, Sahani M, and Shenoy KV (2010) *Stimulus onset quenches neural variability: a widespread cortical phenomenon*. *Nature Neuroscience*, 13, 369–378.

Chang SW, Papadimitriou C, and Snyder LH (2009) Using a compound gain field to compute a reach plan. *Neuron*, 64, 744–755.

Chang SW, Dickinson AR and Snyder LH (2008) Limb-specific representations of reaching in the posterior parietal cortex. *Journal of Neuroscience*, 28, 6128–6140.

Chang SW and Abrams RA (2004) Hand movements deviate toward distracters in the absence of response competition. *Journal of General Psychology: Special Issue on Movement, Attention, and Perception*, 131, 328–344.

BOOK CHAPTERS

Ebner NC, Bailey PE, Horta M, Joinder JA, and **Chang SW** (2016) Multidisciplinary perspective on prosociality in aging. *Chapter in Social Cognition: Development Across the Life Span*, Eds. Sommerville and Decety (Psychology Press | Taylor and Francis Group).

RESEARCH SUPPORT

ONGOING

NIH/NIMH

(Role: PI)

R01MH110750

7/01/2016 - 3/31/2021)

Toward A Macaque Model Of Social Brain Dysfunction In Real-Life Social Interactions

The goal of this project is to capitalize on the neuronal coordination between the anterior cingulate cortex and the basolateral amygdala to causally induce social dysfunction in macaque models of social behavior.

NIH/NIMH R00 Pathway to Independence

(Role: PI)

R00 MH099093

(8/1/2014 - 12/31/2017)

Role of Oxytocin in the Amygdala-Prefrontal Network during Social Decision-Making

The goal of this project is to investigate the mechanisms underlying oxytocin-mediated neural processing across amygdala and prefrontal neurons in social decision-making.

SPONSOR ROLE

(last updated: 11-17-2017)

NSERC PGSD
(Role: Mentor; Fellow: Matthew Piva)
NSERC PGSD3-471313-2015
(9/01/2015 – 8/31/2018)

Neural Mechanisms of Reward-Guided Reciprocity in Rhesus Macaques

The goal of this fellowship is to support Mr. Piva to successfully carry out his Ph.D. project and to develop his professional career as a young neuroscience investigator.

COMPLETED

Alfred P. Sloan Fellowship in Neuroscience
(Role: PI)
FG-2015-66028
(9/15/2015 - 9/14/2017)

Not specific to any project.

NIH/NIMH
(Role: PI)
R21MH107853
(9/25/2015 - 7/31/2017)

Neural Mechanisms of Reward-Guided Reciprocity

The goal of this project is to develop a turn-taking dictator game in rhesus monkeys in order to investigate neuronal signatures of reciprocity in the anterior cingulate cortex (ACC).

Simons Foundation
(Role: Co-I, PI: Platt)
304935
(9/1/2014 - 8/31/2017)

Safety, Efficacy, and Basis of Oxytocin and Brain Stimulation Therapy in ASD

The goal of this project is to determine the effectiveness, safety, and basis of both transcranial magnetic stimulation (TMS) and inhaled OT to improve social function in rhesus macaques.

Theresa Seessel Fund
(Role: PI)
(12/1/2015 - 11/30/2016)

Yale University's Endowed Fellowship for supporting a postdoctoral fellow. Not specific to any project.

Simons Foundation (SFARI)
(Role: PI)
365029
(6/1/2015 - 5/31/2016)

Optimizing Social Effects of Oxytocin with Opioid Blocker

The goal of this project is to explore whether concurrently enhancing oxytocin and attenuating opioids, using opioid blocker, will significantly boost prosocial behaviors compared to delivering either chemical alone.

Theresa Seessel Fund
(Role: PI)
(11/1/2014 - 10/31/2015)

Yale University's Endowed Fellowship for supporting a postdoctoral fellow. Not specific to any project.

NIH/NIA R24 pilot award
Research Network on
Decision Neuroscience and Aging (SRNDNA)
(Role: PI)
R24 AG039350

(last updated: 11-17-2017)

(9/1/2014 - 2/28/2015)

The Role of Oxytocin in Prosocial Decision Making in Aging across Humans and Monkeys

The goal of this project is to investigate how the neuropeptide oxytocin modulates prosocial behaviors in aging, comparatively across both rhesus macaques and humans.

NIH/NIMH K99 Pathway to Independence

(Role: PI)

K99 MH099093

(9/1/2012 - 6/30/2014)

Role of Oxytocin in the Amygdala-Prefrontal Network during Social Decision-Making

The goal of this project is to undergo extensive training in neuroendocrinology, and study the mechanisms underlying oxytocin-mediated neural processing across amygdala and prefrontal neurons in social decision-making.

Department of Defense (Army)

(PI: Platt, Role: Senior postdoc)

W81XWH-11-1-0584

(7/1/2011 - 6/30/2014)

Neural Basis of Empathy and Its Dysfunction in Autism Spectrum Disorders (ASD)

Autism Research Program Idea Development Award

The goal of this project is to determine the role of orbitofrontal cortex in vicarious experience

NIH/NIMH

(PI: Platt, Role: Senior postdoc)

R01 MH095894

(2/21/2012 - 6/30/2014)

Neuronal Basis of Vicarious Reinforcement Dysfunction in Autism Spectrum Disorder

The goal of this project is to understand the role of prefrontal cortex in mediating vicarious reinforcement during reward allocation decisions

Duke Department of Neurobiology

(Role: Awarded fellow)

NIH/NINDS T32 NS051156

(6/1/2011 – 5/31/2012)

Neural Basis of Other-Regarding Preference

Postdoctoral Training Award in Fundamental & Translational Neuroscience

The goal of this project is to understand the role of anterior cingulate cortex and orbitofrontal cortex during reward allocation decisions

Ruth K. Broad Biomedical Research Foundation

(Role: Awarded fellow)

(6/1/2010 - 5/31/2011)

Neural Basis of Empathy and its Dysfunction in Neuropsychiatric Disorders

The goal of this project is to develop a nonhuman primate model of social decision-making and collect pilot behavioral and neurophysiological data

COMPLETED SPONSOR ROLE

Yale

(Role: Mentor; Fellow: Mackenzie Smith)

(6/1/2016 – 8/1/2016)

Science, Technology & Research Scholars (STARS) Program

Yale

(Role: Mentor; Fellow: Jason Morris)

(6/1/2015 – 8/1/2015)

Timothy Dwight Richter Fellowship for Undergraduate Research

INVITED TALKS

“Reference frames for social decision outcomes by primate frontal cortex”
National Institute of Mental Health, 9/17/2012

“Social decision-making in monkeys: from other-regarding preferences to oxytocin to neuronal encoding by the frontal cortex”
University of Wisconsin Madison, Dept of Psychology, 12/03/2012

“Social decision-making in monkeys: from other-regarding preferences to oxytocin to neuronal encoding by the frontal cortex”
Yale University, Dept of Psychology, 1/16/2013

“Social decision-making in monkeys: from other-regarding preferences to oxytocin to neuronal encoding by the frontal cortex”
Oregon National Primate Center, Division of Neuroscience, 02/04/2013

“Social decision-making in monkeys: from other-regarding preferences to oxytocin to neuronal encoding by the frontal cortex”
University of Massachusetts Amherst, Dept of Psychology, 02/14/2013

“Making social decisions: Tales from the primate amygdala”
Current Work in Behavior, Genetics, and Neuroscience, Yale University, 03/28/2014

“Focal infusion of oxytocin in the primate amygdala promotes prosocial behavior”
SRNDNA workshop on advancing cross-species collaborations focused on decision making & aging, 05/26/2014

“Neurobiology of primate prosocial behavior”
Yale NeuroDay, Yale University, 8/15/2014

“Neurobiology of primate prosocial behavior”
Dept. of Neurobiology Seminar, Yale University, 8/28/2014

“Monkey see, monkey donate: neurobiology of primate prosocial behavior”
Biological Anthropology Colloquium, Yale University, 12/4/2014

“Neurobiology of primate prosocial behavior”
Columbia University, University Seminar on Cognitive and Behavioral Neuroscience, 09/18/2014

“Studying primate prosocial behaviors in individual neurons”
University of Rhode Island, Neuroscience Program Colloquium, 11/03/2014

“Neurobiology of reward processing across self and other”
Yale University Biological Sciences Training Program, 03/30/2015

“Using oxytocin in rhesus macaques to improve complex social cognition”
NIH workshop: Oxytocin in Intellectual and Developmental Disabilities (IDD): Research Gaps and Opportunities, 04/21/2015

“Neurobiological mechanisms of primate prosocial behavior”
Emory University, “The Mechanisms of Learning Forum”, 04/24/2015 (student-invited)

“Using live social interactions to study neural mechanisms of prosocial behavior in monkeys”
Dartmouth College, Social Brain Sciences Talk Series, 05/14/2015

“Studying the social brain using dyadic interactions in monkeys”
University College London, “online talk series”, 06/11/2015

TBD (travel canceled)
RIKEN Brain Science Institute, Japan, 7/22

TBD (travel canceled)
Osaka University, Japan, 7/24

“Value-mirroring by the primate amygdala neurons in social decisions”
Amygdala in Health and Disease: Gordon Research Conference, 08/04/2015

“Neurobiology of primate social interactions”
Bard College, 12/03/2015

“Value processing and gaze dynamics during social interactions”
National Institute of Mental Health, 3/25/2016

“Context-dependent social gaze dynamics between pairs of rhesus macaques”
University of Rochester Center for Visual Science (CVS) Symposium, “Future of Attention”, 06/04/2016

“Live Interaction Distinctively Shapes Primate Social Gaze Dynamics [and their Pharmacology]”
International Congress of Psychology, “The Value of Eye-to-Eye Contact in Studying the Social Brain”. Yokohama, Japan, 07/27/2016 (Talk given by Olga Dal Monte)

Chair’s introductory talk on the session “Social Decision Making / Behavioral Economics”
6th Indonesian-American Kavli Frontiers of Science symposium (US National Academy of Sciences plus Indonesian Academy of Sciences), Malang, Indonesia, 08/04/2016

“Supralinear enhancements of social gaze dynamics with oxytocin under opioid antagonism”
University of Connecticut, Behavioral Neuroscience Seminar, 10/27/2016

“Supralinear modulating social gaze dynamics with oxytocin under opioid antagonism”
Early Career Award Talk, 11/11/2016

“Neuronal synchrony between the anterior cingulate cortex and the amygdala in prosocial decision-making”
Society for Neuroscience *Symposium* talk - Neural basis of social rewards and group decisions: from scanners to real-world, 11/16/2016

“Oxytocin under opioid antagonism leads to supralinear enhancement of social attention”
Mount Sinai Icahn School of Medicine, Friedman Brain Institute, 2/22/2017

“Oxytocin and opioid modulation of social attention in rhesus macaques”
Yale Biological Anthropology neuroendocrinology seminar, 3/28/2017

“Neuronal coupling between the anterior cingulate cortex and the amygdala reflects social decision outcomes”
Social and Affective Neuroscience Society (SANS) meeting; Anchor talk, Los Angeles, CA, 3/2017

“Optimizing social effects of oxytocin with opioid antagonists”
Simons Foundation Autism Research Initiative (SFARI) meeting, New York, NY, 4/3/2017

“Neuronal coupling between the anterior cingulate cortex and the amygdala underlies social behavior”
Yale Department of Neuroscience Annual Retreat, Jiminy Peak, MA, 4/29/2017

“Establishing neural principles of dynamic and interactive social behaviors”
Cognitive Neuroscience Society (CNS) 2018, in the Symposium: *Opportunities and Challenges for the Next 25 Years of Cognitive Neuroscience*; Boston, MA, 3/25/2018

“Monkeys thinking about other monkeys: a neurobiological perspective”
At the summer course on “The Other-Minds Problem: Animal Sentience and Cognition”
Cognitive Sciences Institute, Université du Québec à Montréal, Montréal, Québec, Canada, 6/xx/2018

TEACHING

Yale University

Cognitive Neuroscience (NSCI 340/PSYC 335) (Fall 2017 -)

Systems Neuroscience (PSYC 411/611/NSCI 445; NSCI 611b) (Spring 2015 -)

Foundations of Neuroscience: Biological bases of human behavior (PSYC 530; core neuroscience course in psychology): Sections on 1) Principles of sensorimotor systems and 2) Learning and neural control systems (Fall 2017 -)

Foundations of Systems Neuroscience (INP; core INP course): Sections on 1) Posterior Parietal Cortex. Multisensory Integration, 2) Subcortical affective circuits, and 3) Social cognition, communication and autism (Spring 2018 -)

Neurobiology of Cortical Systems (NBIO 532): Section on *Prefrontal cortex and Social Cognition* (Spring 2015 -)

Statistics and Data Analysis in Neuroscience (INP/NBIO 599): Sections on *Hypothesis testing and Model comparisons* (Spring 2017 -)

Computational Modeling & Analysis in Neuroscience (NSCI 588a) (Fall 2015 -): Section on *Behavioral Data Analysis: Visualization of Choice Data*

Guest lecturer:

Intro to Psychology (PSYC 100), 2016; Neuroeconomics for Economists (ECON 422), Fall 2017;
Social Neuroscience (NSCI 355/PSYC 303), 2018

Current works in Behavior, Genetics, and Neuroscience (PSYC 704) (Fall 2014 - Spring 2016) (Talk Series)

Research Topics: Neuroscience of Social Behavior (PSYC 752) (Fall 2014 -) (Open lab meeting)

Duke University

Special Topics in Neuroscience: Social Neurosciences (NEURO/PSY 390S) (Spring 2014)

Guest lecturer:

Behavioral Neuroendocrinology (NEURO 366S/PSY 376S) (10/30/2012)

Organizer & moderator: *Neuropeptides, Cognition, and Clinical Implications* (2012-14)

Washington University in St. Louis School of Medicine

Teaching Assistantship: *Neural Sciences* (Bio 554; Spring 2005)

Teaching Assistantship: *Sensation & Perception* (Psych 330; Fall 2001)

MENTORING

Advisor

Post-Docs

Amrita Nair (3/2014 - present)

Olga Dal Monte (3/2015 - present)

Weston Pack (9/2014 - 1/2016)

Graduate Students

Jessica Joiner (Psychology) (8/2014 - present)

Matthew Piva (Interdepartmental Neuroscience Program) (8/2014 - present)

Hannah Weinberg-Wolf (Psychology) (8/2015 - present)

Siqi Fan (Psychology) (8/2017 - present)

Kayla Velnoskey (Psychology) (8/2016 - 9/2017; Masters)

Courtney Turrin (Psychology) (8/2015 - 5/2017; Masters)

Undergraduate Students with Senior Thesis from the lab

Nicholas Fagan (Psychology/Neuroscience) (8/2014 - 5/2015)

Thesis (distinction): Neuronal correlates of social decisions in the primate amygdala

Nick graduated from the lab and joined the lab as a data analyst

Doug Streat (Psychology/Neuroscience) (1/2015 - 5/2016)

Thesis (distinction): Dose-response investigation of oxytocin and naloxone as modulators of social attention in non-human primates

Doug graduated from the lab to finish up his MPH program at Yale School of Public Health

Jason Morris (Psychology/Neuroscience) (1/2015 - 5/2017)

Thesis (distinction): Oxytocin Driven Modulation of Neuronal Connectivity Between the Anterior Cingulate Cortex and the Amygdala during Social Decision Making.

Jason graduated from the lab to attend the MD program at Washington University School of Medicine in St. Louis with Full-Ride

Marios Tringides (Molecular Cellular Development Bio/Neuroscience) (8/2014 - 5/2017)

Thesis: Genetic Investigations into the Casual Role of Serotonin in Social Gaze Dynamics

Marios graduated from the lab to attend the Neurobiology PhD program at Duke University with additional Doris Duke Fellowship on top

Angelica Fuentes (Cognitive Science) (12/2014 - 5/2017)

Thesis: Effects of Pharmacological Manipulations on Natural Social Interaction in Rhesus Macaques: A Pilot Investigation

Angie graduated from the lab to attend the MD program at the University of Illinois Chicago

Ph.D. Thesis Committee

Jamie Benoit (Psychology, Rakic lab), Su Mei Lee (Psychology, McCarthy lab), Junli Ping (Psychology, Schafe lab), Amber Baysinger (Psychology, Taylor lab), Danielle Gerhard (Psychology, Duman lab), Amanda Blue Zheutlin (Psychology, Cannon lab), Zarrar Shehzad (McCarthy lab), Lindsey Drayton (Santos lab), Lauren Patrick (Holmes lab), Erica Ho (Holmes lab), Anton Gollwitzer (Bargh lab), Zarrar Shehzad (Psychology, McCarthy lab), Yi-Chia Chen (Psychology, Scholl lab)

UNIVERSITY SERVICES

- **Graduate Program Advisory / Affairs Committee**, Dept. of Psychology, Yale University (2014 - present)

- Neuroscience Curriculum Committee, Dept. of Psychology, Yale University (2015 - present)
- Teaching Fellow Allocation Committee, Dept. of Psychology, Yale University (2015)
- College advisor, Jonathan-Edward College, Yale University (2015 - present)
- Department website improvement Committee, Dept. of Psychology, Yale University (2015)
- **Senior Faculty Search Committee**, Dept. of Psychology, Yale University (*Cognitive area*, 2015)
- **Senior Faculty Search Committee**, Dept. of Psychology, Yale University (*General*, 2015)
- **Junior Faculty Search Committee**, Child Study Center, Yale University School of Medicine (*Systems Biology*, 2015)
- Organizer, Yale Neuroeconomics Forum (2016)
- **Faculty Search Committee**, Dept. of Neuroscience, Yale University (2016)
- **Development of a team-taught core neuroscience graduate course**, Dept. of Psychology, Yale University (2017)
- Committee on the policy and protocols for safe participation by undergraduates in nonhuman primate (NHP) research, Yale University (2017)
- Committee on lecturer reappointment, Dept. of Psychology, Yale University (2017)
- **Working Group on Neuroscience Major**, Yale University (2016 - 2017)
- **Yale Neuroscience Major Curriculum Committee** (2017 - present)
- **Faculty Search Committee**, Dept. of Psychology, Yale University (2017)
- Department of Psychology Diversity Committee (2017)
- **Office of Cooperative Research (OCR) Committee**, Yale University (2017 - 2018)
- **Faculty Search Committee**, Dept. of Neuroscience, Yale University (2017)
- **Kavli Institute for Neuroscience Steering Committee**, Yale University School of Medicine (2017 - 2020)
- **Interdepartmental Neuroscience Program Admissions Committee**, Yale University School of Medicine (2017)

REVIEWER ROLE

- **Editor**

- Guest associate editor/Guest editor

- Frontiers in Neuroscience (completed in 2014)

- “Neural basis of social learning, social deciding, and other-regarding preferences”

- Special Issue in Brain Research (completed in 2014)

- “Oxytocin and human social behavior, social cognition and psychopathology”

Ad Hoc Editor
PNAS

- **Editorial Board**
Frontiers in Integrative Neuroscience (Reviewing Editor)
Social Neuroscience (Editorial Board)
- **External grant reviewer**
National Institute of Mental Health (NIMH)
Wellcome Trust
Medical Research Council (MRC)
Biotechnology and Biological Sciences Research Council (BBSRC)
Human Frontiers Science Program (HFSP)
Fonds de recherche du Québec – Nature et technologies
- **Internal grant reviewer**
Yale-NUS
- **Peer manuscript reviewer**
Cell, Nature Reviews Neuroscience, Proceedings of National Academy of Sciences, Nature Communications, Journal of Neuroscience, Current Biology, Cerebral Cortex, Neuropsychopharmacology, Perspectives in Psychological Sciences, Journal of Neurophysiology, Science Advances, Psychoneuroendocrinology, European Journal of Neuroscience, Social Cognitive and Affective Neuroscience, Behavioral Brain Research, Behavioral Neuroscience, Royal Society Proceedings of the Royal Society B, Schizophrenia Research, Frontiers Journals, Journal of Neuroscience Methods, Scientific Reports, Journal of Neuroendocrinology, WIREs Cognitive Science.

SELECTED PROFESSIONAL ACTIVITIES

- Visuomotor Journal Club Organizer, Washington University (2006-2008)
- Social Neuroscience Journal Club Organizer, Duke University (2010-2011)
- Center for Neuroeconomics Retreat Committee, Duke University (2010)
- Society for Neuroscience *NeurOnLine*; Role: “Champion” in Motor Systems Neuroscience Online Community (2011 - 2013)
- **Program Committee**, D-Cides(Duke Center for Interdisciplinary Decision Sciences) Regional Conference (2012)
- **Chair, Society for Neuroscience Nanosymposium**: “Neural Basis of Decision Making” (2012)
- Guest speaker at the Sonoma Academy, Santa Rosa, CA (Nov. 2013, Aug. 2015)
- **Discussion Leader & Career Panelist**, Gordon Research Seminar: Amygdala in Health and Disease (2015)
- Organizer (with Keise Izuma), Japan Neuroscience Society symposium: “Advances in the study of the social brain” (2015)
- **Early Career Reviewer (ECR) Program** (NIH/NIMH) (2014 - 2016)
- **Program Committee**, Society for Social Neuroscience (2016, 2017)
- **Program Committee**, Society for Neuroeconomics (2016)
- **Chair, Kavli Frontiers of Science symposium** (Indonesian-American) (2016)
- **Reviewer**, *Cosyne* (Computational and Systems Neuroscience) (2017)
- Discussion Faculty on *Research with Animals* in Neuroethics Interdepartmental Neuroscience Program course, Yale University (2/2017)

SELECTED MEDIA

PNAS Press Release (May, 1, 2017)
“Oxytocin and Opioid Systems in Social Interaction”

Yale News (May, 1, 2017)
“Combination approach may help combat autism”

Yale News (May 18th, 2016)
“Research note: Brain area crucial to ability to assess motives of others”

Yale Scientific Magazine (April 5th, 2016)
“What Makes Us Generous? The Neuroscientist’s Take”

Slate (Mar 17th, 2016)
“Yale vs. Duke Is the Most Annoying Matchup in NCAA Tournament History”

Daily Mail (Dec 16th, 2015)
“Are you a Scrooge? Researchers pinpoint ‘generous’ center of the brain”

VICE Magazine - Motherboard (Dec 15th, 2015)
“How your brain determines if you're a Santa or Scrooge”

Yale News (Dec 15th, 2015)
“To give or not to give: Value assessment arises in tiny area of the brain”

Skeptically Speaking (Mar 1st, 2013)
“The altruism equation”

NBC News (Dec 28th, 2012)
“Scientists identify unselfish brain cells in monkeys”

Scientific American (Dec 26th, 2012)
“Monkey brain area keeps count of kindnesses”

Nature-Asia Highlights (Dec 24th, 2012)
“Social rewards in the brain”

Nature News (Dec 23rd, 2012)
“Monkey brain area keeps count of kindnesses”

National Geographic (Dec 23rd, 2012)
“Generosity and the social brain, one neuron at a time”

Society for Neuroscience Press Room: The Social Brain (Oct 16th, 2012)
“New Findings Illuminate Basis in Brain for Social Decisions, Reactions”

Biological Psychiatry (July 24th, 2012)
“Classifying Neural Circuit Dysfunctions Using Neuroeconomics”

National Geographic, Daily News (Jan 9th, 2012)
“Exposure to ‘Love Hormone’ Increases Prosocial Behavior in Monkeys”

US News (HealthDay) (Jan 10th, 2012)
“Monkeys Treated With ‘Love Hormone’ Show More Kindness”

ScienceNews (April 7th, 2012)

“Furry Friends Forever”

abc News (Jan 11th, 2012)

“A Love Drug? Oxytocin Hormone Makes Mothers Kinder”

FEATURED HIGHLIGHTS BY PEERS

Blohm G and Crawford JD (2009) Fields of gain in the brain. *Neuron*, 64:744-55.

Whalley K (2012) Social neuroscience: Oxytocin boosts social awareness. *Nature Reviews Neuroscience*, 13, 72.

MEDIA COMMENTARY ON OTHER'S WORK

- **The Scientist** (9/6/2016), “Specialized Neurons Encode Social Learning in Humans”
- **New York Times** (4/16/2015), “The Look of Love is in the Dog’s Eyes”
- **Chemical and Engineering News** by the American Chemical Society (4/15/2015) “Oxytocin Promotes Social Behaviors By Tuning Brain Circuits”
- **Nature News** (2/25/2014), “Monkey Brains Wired to Share”

MEMBERSHIPS

- Society for Neuroscience member (2003 - present)
- Society for Social Neuroscience member (2012 - present)
- Society for Neuroeconomics member (2011 - 2015)
- Association for Psychological Science (2016)

MEETING ABSTRACTS

Washington, DC, 2017

Society for Neuroscience & Society for Social Neuroscience

Oxytocin modulates the coupling between the anterior cingulate gyrus and amygdala during prosocial and antisocial decisions (SfN talk; S4SN poster)

Dal Monte O, Fagan N and Chang SW

Serotonergic efficiency underlies causal effect of 5-HTP on Attention (poster)

Weinberg-Wolf H, Fagan N, Dal Monte O, Tringides M, Anderson G and Chang SW

Vicarious subjective value representation in the human brain: an fMRI investigation (poster)

Piva M, Velnoskey K, Jia R, Levy I, and Chang SW

Activity in the temporoparietal junction (TPJ) tracks dynamic changes in uncertainty when observing goal-directed action (poster)

Velnoskey K, Chang SW and McCarthy G

Naples, Italy, 2017

Italian Neuroscience Society

Oxytocin differentially couples the anterior cingulate cortex and amygdala for prosocial and antisocial decisions (talk)

Dal Monte O, Fagan N, and Chang SW

Melbourne Beach, FL, 2017

International Conference On Comparative Cognition

A paradoxical pupil size effect in rhesus monkeys performing a social vicarious reinforcement task

Basile B, Karaskiewicz C, Chang SW, and Murray EA

San Diego, CA, 2016

**Society for Neuroscience &
Society for Social Neuroscience**

Neuronal synchrony between the anterior cingulate cortex and the amygdala reflects prosocial decision outcomes (SfN poster; S4SN talk)

Dal Monte O, Fagan N, Nair A and Chang SW.

Social foraging obeys the marginal value theorem in rhesus macaques (poster)

Turrin C and Chang SW.

Supralinear effects of combined oxytocin and opioid blockade on contingent social gaze dynamics (poster)

Piva M, Dal Monte O*, Tringides M and Chang SW.*

Serotonin promotes sustained attention to viewer-directed social signals (poster)

Weinberg-Wolf H, Fagan N, Dal Monte O and Chang SW.

Society for Neuroscience

Exploring social curiosity in non-human primates (poster)

Joiner J and Chang SW.

Rochester, NY, 2016

Rochester Center for Visual Science Symposium (poster)

It takes two to tango: Combinatorial effects of oxytocin and opioid blockade on contingent social gaze dynamics

Dal Monte O, Piva M*, Tringides M, Streat D, Morris J and Chang SW.*

Chicago, IL, 2015

Society for Neuroscience (posters)
Society for Social Neuroscience (posters)

Seeing eye-to-eye: live gaze interactions in pairs of rhesus macaques robustly capture dominance behavior **[Winner of the best poster award (1st place)]**

Dal Monte O, Piva M, Joiner JA, Pack WD, Nair AC and Chang SW.

Counterbalancing prosocial decisions across egocentric and allocentric reward contexts in rhesus macaques

Pack WD, Joiner JA and Chang SW.

Pupillary correlates of vicarious reward in rhesus macaques

Joiner JA, Fagan NA, Platt ML and Chang SW.

Neural specialization for interpersonal interaction in a competitive gambling task

Piva M, Zhang X, Noah A, Chang SW, Hirsch J

Easton, MA, 2015

Amygdala in Health & Disease: Gordon Research Conference (poster)

Seeing eye-to-eye: live gaze interactions in pairs of rhesus macaques robustly capture dominance behavior **[Winner of the best poster award]**

Dal Monte O, Piva M, Morris J, and Chang SW.

Atlanta, GA, 2015

Mechanisms of Learning Forum (Emory Univ.) (poster)

Pupil size reflects social preference and vicarious reward in rhesus macaques.

Joiner JA, Fagan NA, Platt ML and Chang SW.

Washington, DC, 2014

Society for Neuroscience (poster)

Local injection of oxytocin into the primate amygdala enhances prosocial motivation.

Chang SW, Toda K, Utevsky, AV and Platt ML.

San Diego, CA, 2013

Society for Neuroscience (poster)
Society for Social Neuroscience (poster)

Value-dependent scaling of self- and other-referenced decisions by neurons in primate amygdala.

Chang SW and Platt ML.

Princeton, NJ, 2013

Reinforcement Learning & Decision-Making (poster)

Value-dependent scaling of self- and other-referenced decisions by neurons in primate amygdala.

Chang SW and Platt ML.

Berkeley, CA, 2013

Society for Experimental Social Psychology (invited symposium talk)

The Neuroscience of Primate Prosociality: self- and other-referenced decisions by reward-sensitive neurons in the primate brain.

Chang SW and Platt ML.

New Orleans, LA, 2012

Society for Neuroscience (talk)
Society for Social Neuroscience (contributed talk)

Differential encoding of social decision outcomes by neurons in primate orbitofrontal cortex, dorsal anterior cingulate cortex and anterior cingulate gyrus.

Chang SW, Gariépy JF, and Platt ML.

Society for Neuroscience (talk)
Society for Social Neuroscience (poster)

Neural correlates of deceptive tactics in the primate prefrontal cortex.

Gariépy JF, Chang SW, Du E. and Platt ML.

Atlanta, GA, 2012

Organization for Computational Neuroscience (poster)

Neuronal reference frames for social decisions in primate prefrontal cortex.

Chang SW, Gariépy JF, and Platt ML.

College Park, MD, 2012

International Congress of Neuroethology (poster)

Neural correlates of deceptive tactics in the primate prefrontal cortex.

Gariépy JF, Chang SW, Du E. and Platt ML.

Washington, DC, 2011

Society for Neuroscience (talk)

Differential coding of egocentric and allocentric reward outcomes during social interaction in primate ACC and OFC.

Chang SW and Platt ML.

Society for Neuroscience (poster)

Oxytocin promotes prosocial decisions in rhesus macaques.

Chang SW, Barter JW, Ebitz RB, Watson KK and Platt ML.

Advances in Computational Motor Control X (SfN) (poster)

The representations of reach endpoints in posterior parietal cortex depend on which hand does the reaching.

Chang SW and Snyder LH.

Atlanta, GA, 2011

Workshop on the Biology of Prosocial Behavior at Emory University (poster)
Inhaled oxytocin amplifies both vicarious reinforcement and self reinforcement in rhesus macaques (*Macaca mulatta*).

Chang SW, Barter JW, Ebitz RB, Watson KK and Platt ML.

Kyoto, Japan, 2011

34th Japanese Society for Neuroscience (talk)

Separate channels for self and other reward in primate prefrontal cortex

Platt ML, Chang SW, Winecoff AA, Barter JW

Salt Lake City, UT, 2011

COSYNE (poster)

Spatial and non-spatial representations in the parietal reach region are systematically organized.

Chang SW and Snyder LH.

San Diego, CA, 2010

Society for Neuroscience (poster)

Brain Research meeting:

The Emerging Neuroscience of Autism Spectrum Disorders (poster)

Social Context Gates Other-Regarding Preferences in Rhesus Macaques (*Macaca mulatta*).

Chang SW and Platt ML.

Society for Neuroscience (poster)

Spatial reference frame and limb specificity in macaque posterior parietal cortex.

Chang SW and Snyder LH.

Salt Lake City, UT, 2010

COSYNE (poster)

Idiosyncratic and systematic features of spatial representations in the macaque PRR.

Chang SW and Snyder LH.

Chicago, IL, 2009

Society for Neuroscience (poster)

Equal and opposite eye and hand gain fields for reaching in PRR.

Chang SW, Papadimitriou C, and Snyder LH.

Salt Lake City, UT, 2008

COSYNE (poster)

Stimulus onset quenches neural variability: a widespread cortical phenomenon.

Churchland MM, Yu BM, Cunningham JP, Sugrue LP, Cohen MR, Corrado GS, Newsome WT, Clark AM, Hosseini P, Scott BB, Bradley DC, Smith MA, Kohn A, Movshon JA, Armstrong KM, Moore T, Chang SW, Snyder LH, Ryu, SI, Santhanam G, Sahani M, and Shenoy KV.

Washington, DC, 2008

Advances in Computational Motor Control VII, ISSN 1944-4001 (SfN) (talk)

Gain fields for the distance between the ocular fixation point and the arm.

Chang SW and Snyder LH.

Dynamical Neuroscience XVI:

Neuronal Variability and Its Functional Significance (SfN) (talk)

A widespread stimulus-driven reduction in cortical variability.

Churchland MM, Yu BM, Cunningham JP, Sugrue LP, Cohen MR, Corrado GS, Newsome WT, Clark AM, Hosseini P, Scott BB, Bradley DC, Smith MA, Kohn A, Movshon JA, Armstrong KM, Moore T, Chang SW, Snyder LH, Ryu, SI, Santhanam G, Sahani M, and Shenoy KV.

Pittsburgh, PA, 2008

**The 4th International Statistical Analysis of Neuronal Data (SAND) meeting
University of Pittsburgh (Dept. of Statistics) (talk)**

The distance between the (initial) eye and arm position is coded in PPC using a gain field.

Chang SW and Snyder LH.

San Diego, CA, 2007

Society for Neuroscience (poster)

Diverse frames of reference in the parietal reach region (PRR).

Chang SW and Snyder LH.

Lewiston, ME, 2007

The Gordon Research Conferences, Oculomotor System Biology (poster)

Neurons in the Parietal Reach Region of monkeys plan contralateral but not ipsilateral arm movements.

Chang SW and Snyder LH.

Washington, DC, 2005

Society for Neuroscience (talk)

Arm selectivity during reach planning in macaque posterior parietal cortex.

Chang SW, Dickinson AR and Snyder LH.

Saint Louis, MO, 2002

2002 HHMI Fellow Symposium at Washington University (talk)

Reaching with the right or the left arm: Neuronal activity in parietal reach region of monkey posterior parietal cortex - How specific are neurons in posterior parietal cortex in sensorimotor transformation?

Chang SW, Dickinson AR and Snyder LH.

The Annual Undergraduate "Psymposium" (talk)

Washington University Department of Psychology

Detecting a target versus reaching out to it: The influence of visual detection on reaching.

Chang SW and Snyder LH.