

**Alexandra Ycaza Herrera, Ph.D.**  
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## **Current Appointment**

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2019-present      Research Assistant Professor of Gerontology  
USC Leonard Davis School of Gerontology  
University of Southern California, Los Angeles CA

## **Past Appointment**

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2014-2019      Post-doctoral Scholar  
USC Leonard Davis School of Gerontology  
University of Southern California, Los Angeles CA

## **Education**

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2014      **Ph.D., Psychology: Cognitive Neuroscience**  
University of Southern California, Los Angeles CA  
**Thesis: *Effects of estradiol on cortisol response, working memory, and emotional memory during stress in young and post-menopausal women***

2009      **M.A., Psychology: Behavioral Neuroscience**  
University of Southern California, Los Angeles CA  
**Thesis: *Age-related changes in cognitive functioning and their implications for the reacquisition of conditioned taste avoidances***

2005      **B.A., Psychology: Biological Emphasis**  
University of Southern California, Los Angeles CA

## **Fellowships, Grants, and Awards**

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2018      USC Postdoctoral Training & Travel Award  
\$2,000

2017      Scholar, Neuroscience School of Advanced Studies  
Advanced Course in Cognitive Decline and Aging  
Siena, Tuscany, Italy

2015-2018      National Institute on Aging (R21-AG0488463)  
*Effect of Estrogen on Working Memory During Stress*  
Co-Investigator  
PI: Mara Mather  
Funded amount: \$453,438.00 (direct + indirect)

- 2013 Fellow, Dornsife 2020 Graduate Fellowship  
Social Neuroscience: Integrating Society, Mind, and Brain
- 2012 - 2013 Fellow, Department of Psychology  
Valentine Fellowship

## Publications

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- Herrera, A.Y.**, Gillette, K., Clewett, D., Velasco, R., Faude, S., White, J., & Mather, M. (*In preparation*). Frontoparietal network activation during an auditory oddball task differs across the hormonal contraceptive cycle.
- Nasseri, P., **Herrera, A.Y.**, Gillette, K., Faude, S., White, J.D., Velasco, R., & Mather, M. (2020). Hormonal contraceptive phases matter: Resting-state functional connectivity of emotion-processing regions under stress.
- Herrera, A.Y.**, Velasco, R., Faude, S., White, J., Opitz, P.C., Huang, R., Tu, K., & Mather, M. (2020). Brain activity during a post-stress working memory task differs between the hormone-present and hormone-absent phase of hormonal contraception. *Neurobiology of Stress*, <https://doi.org/10.1016/j.ynstr.2020.100248>
- Herrera, A.Y.**, Faude, S., Nielsen, S.E., Locke, M., & Mather, M. (2019). Effects of hormonal contraceptive phase and progestin generation on stress-induced cortisol and progesterone release. *Neurobiology of stress*, <https://doi.org/10.1016/j.ynstr.2019.100151>
- Herrera, A.Y.**, Wang, J., & Mather, M. (2019). The gist and details of sex differences in cognition and the brain: How parallels in sex differences across domains are shaped by the locus coeruleus and catecholamine systems. *Progress in neurobiology*, 176, 120-133.
- Herrera, A.Y.**, Hodis, H.N., Mack, W.J., & Mather, M. (2017). Estradiol after menopause reduces cortisol response to stress and mitigates effects of stress on working memory. *Journal of Clinical Endocrinology & Metabolism*, <https://doi.org/10.1210/jc.2017-00825>
- Nielsen, S.E., & **Herrera, A.Y.** Sex Steroids, Learning and Memory. In: Pfaff, D.W and Joëls, M. (editors-in-chief), *Hormones, Brain, and Behavior* 3rd edition, Vol 1. Oxford: Academic Press; 2017. pp. 399–422.
- Herrera, A. Y.**, Nielsen, S. E., & Mather, M. (2016). Stress-induced increases in progesterone and cortisol in naturally cycling women. *Neurobiology of stress*, 3, 96-104.
- Herrera, A.Y.**, & Mather, M. (2015). Actions and interactions of estradiol and glucocorticoids in cognition and the brain: Implications for aging women. *Neuroscience & Biobehavioral Reviews*, 55, 36-52.
- Sakaki, M., **Ycaza-Herrera, A. E.**, & Mather, M. (2014). Association learning for emotional harbinger cues: when do previous emotional associations impair and when do they facilitate subsequent learning of new associations? *Emotion*, 14(1), 115.

## Presentations

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**Herrera, A.Y.**, Nasser, P., Gillette, K., Faude, S., White, J., Velasco, R., Mather, M. (2019). Resting state functional connectivity under stress differs across the hormonal contraceptive cycle. Neuroscience 2019 Abstracts, Chicago, IL, US: *Society for Neuroscience, 2017*. Online

Gillette, K.\*, **Herrera, A.Y.**, Velasco, R., Faude, S., White, J., Mather, M. (2018). Differential effects of stress exposure on salience network activation across the hormonal contraceptive cycle. University of Southern California Undergraduate Symposium for Creative and Scholarly Work, Los Angeles, CA, US.

**Herrera, A.Y.**, Velasco, R., Faude, S., White, J., Opitz, P.C., Huang, R., Tu, K., Mather, M. (2018). Effect of hormonal contraceptive phase on default mode network activity during working memory under stress. Winter Conference on Brain Research, Whistler, B.C, Canada.

**Herrera, A.Y.**, Velasco, R., Faude, S., White, J., Opitz, P.C., Huang, R., Tu, K., Mather, M. (2017). Differential effects of stress exposure on working memory performance across the hormonal contraceptive cycle. Neuroscience 2017 Abstracts, Washington, D.C., US: *Society for Neuroscience, 2017*. Online

White, J.\*, **Herrera, A.Y.**, Mather, M. (2017). The effects of hormonal contraception on hippocampal volume in young women: a neuroimaging study. University of Southern California Undergraduate Symposium for Creative and Scholarly Work, Los Angeles, CA, US.

Faude, S.\*, **Herrera, A.Y.**, Mather, M. (2016). The relationship between female sex hormones, mood, and the stress response in women using and not using hormonal contraception. University of Southern California Undergraduate Symposium for Creative and Scholarly Work, Los Angeles, CA, US.

**Ycaza, A.E.**, Nielsen, S.E., Mather, M. (2015). Stress response profiles in women during the active hormone and inactive no-hormone weeks of hormonal contraception. Neuroscience 2015 Abstracts, Chicago, IL, US: *Society for Neuroscience, 2015*. Online

**Ycaza, A.E.**, Nielsen, S.E., Mather, M. (2014). Cortisol response to cold pressor stress varies during the follicular phase of the menstrual cycle depending on progesterone levels. Neuroscience 2014 Abstracts, Washington, DC, US: *Society for Neuroscience, 2014*. Online.

**Ycaza, A.E.**, Hodis, H.N., Mack, W.J., Mather, M. (2013). Estrogen treatment after menopause protects against stress-induced impairments in working memory. Neuroscience 2013 Abstracts, San Diego, California, US: *Society for Neuroscience, 2013*. Online.

Sakaki, M., **Ycaza, A.**, & Mather, M. (2012). When do previous emotional associations impair and when do they facilitate subsequent learning of new associations? *53rd Annual Meeting of Psychonomic Society*, Minneapolis, US.

Lighthall N, Nga L, **Ycaza A**, Jang J, Velasco R, Mather M. (2012). Stress effects on reinforcement learning in younger and older women: An fMRI investigation. *Cognitive Neuroscience Society*. Chicago, IL, US.

Hintiryan, H., Foster, N.N., **Ycaza, A.E.**, Chambers, A.Y., Keebler, C.N., Lavond, D.G., and Chambers, K.C. (2006). Contribution of unconditioned reductions in food consumption to conditioned taste avoidance induced by estradiol. *Neuroscience 2006 Abstracts*, Atlanta, Georgia, US: *Society for Neuroscience, 2006*. Online.

\* *undergraduate and honor student mentees*

## Invited Talks and Media

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- 2018 *Frontoparietal network activation during an auditory oddball task differs across the hormonal contraceptive cycle.* For Society for Neuroscience, Neuroscience 2018: Behavioral Neuroendocrinology. San Diego, California, US.
- 2018 *Effect of hormonal contraceptive phase on brain activation during a working memory task: Differences in The Default Mode Network.* For the Winter Conference on Brain Research: Sex, Signaling and Human Brain Development. Whistler, B.C., Canada.
- 2017 *What's the big deal with hormone replacement therapy?* For Byte of Science, The Hamed Mirzaei Foundation for the Arts & Sciences. Venice, California.
- 2015 *Revisiting the stress response in women.* Brain and Cognitive Sciences and Developmental Psychology Seminar Series. University of Southern California. Los Angeles, California.
- 2013 Invited Panelist for Neuroscience 2013 Hormones and Sex Differences Press Conference. *Hormones impact stress, memories, and understanding social cues: Research reveals new roles for estrogen and finds potential biomarker for maternal stress.* Society for Neuroscience, 2013, San Diego, California, US.

## Teaching Experience

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### Guest Lecturer

- 2017 *Effects of age-related hormonal shifts on health and behavior.*  
Emotion-Cognition Interactions and Aging  
University of Southern California
- 2017 *Reproductive senescence in the human female.*  
Psychology of Adult Development and Aging  
University of Southern California
- 2015-16 *Hormone changes in aging: symptoms and effects.*  
Psychology of Adult Development and Aging  
University of Southern California

2015 *Estradiol and stress: implications for system changes after menopause.*  
Seminar in the Life Sciences  
University of Southern California

### Teaching Assistant

2008-2014 Teaching Assistant, Behavioral Neuroscience (PSYC 326)  
Supervising Faculty: David Lavond, Ph.D.; Katherine Karlsgodt, Ph.D.

2009 - 2010 Teaching Assistant, Learning and Memory (PSYC 305)  
Supervising Faculty: David Lavond, Ph.D.

2007 - 2008 Teaching Assistant, Statistics I (PSYC 274)  
Supervising Faculty: James Neuse, Ph.D.

2007 Teaching Assistant, Introduction to Psychology (PSYC 100)  
Supervising Faculty: Dennis Mitchell, Ph.D.

2006 Teaching Assistant, Introduction to Psychology (PSYC 100)  
Supervising Faculty: Stephen Madigan, Ph.D.

### Mentoring

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Graduate advising: Dissertation Committee Member  
Evan Michael Hess, Ed.D., University of Southern California

Undergraduate advising: Research Assistants

Stephanie Chan  
Claire Bazley  
Mallory Locke  
Aimee Ochsner  
Sophia Faude<sup>+</sup>  
Jessica White<sup>\*\*</sup>  
Katherine Gillette<sup>+</sup>  
Anne Marie Collins  
Kerry McAuley  
Erin Silliman

\* USC Neuroscience Honors Program student

\* student presented at the USC Undergraduate Symposium for Creative and Scholarly Work

### Professional Service

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Society Affiliations

Society for Neuroscience; American Association for the Advancement of Science;  
Association for Psychological Science; Psi Chi Honor Society (Psychology)

Ad-hoc Reviewer

Emotion; Hormones and Behavior; Psychoneuroendocrinology; PLOS One; Brain

## **Research Skills and Techniques**

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### Human Behavioral and Endocrine Studies:

Design; Programming in PsyScope and E-Prime; Data collection; Statistical analyses  
Salivary samples: collection, processing using Enzyme-linked immunosorbent assays (ELISAs): Cortisol; Estradiol; Progesterone

### Human Functional Magnetic Resonance Imaging Studies:

Design; Programming in E-Prime; Data Collection  
Salivary samples: collection, processing using Enzyme-linked immunosorbent assays (ELISAs): Cortisol; Estradiol; Progesterone  
FSL: Preprocessing, T1 and EPI sequences; First-level FEAT, EPI sequences; Higher-level FEAT, EPI sequences; Independent component analyses (single-session, multi-session, tensor); Region of interest analyses; Psychophysiological interaction

### Rodent Behavioral Studies:

Design; Behavioral training; Data collection; Statistical analyses  
Conditioned taste aversions – acquisition; extinction  
Scoring rodent sexual behavior

### Rodent Survival Surgery:

Ovariectomy; Electrolytic lesions; Excitotoxic lesions; Biotinylated dextran amine tracers; Neural cannula implantation; Cheek fistula implantation

### Drug administration for rodent studies, survival surgery, or perfusion:

Subcutaneous injections; Intraperitoneal injections  
17 $\beta$ -estradiol; LiCl; Ketamine/Xylazine; Buprenorphine; Halothane; Isoflurane; Paraformaldehyde

### Immunohistochemical procedures:

Brain perfusion, extraction, slicing  
Cresyl violet staining  
Neuron-specific (NeuN) staining, quantification  
c-Fos staining, quantification