

# Jason S. Tsukahara

PHD STUDENT

School of Psychology, Georgia Institute of Technology

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## Education

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### Doctor of Philosophy, Cognition and Brain Science

GEORGIA INSTITUTE OF TECHNOLOGY

• Advisor: Randall Engle, Ph.D.

2014-Present

Atlanta, GA, USA

### Master of Art, General Experimental Psychology

CALIFORNIA STATE UNIVERSITY SAN BERNARDINO

• Advisor: Hideya Koshino, Ph.D.

2014

San Bernardino, CA, USA

### Bachelor of Art, Behavioral Neuroscience

WESTERN WASHINGTON UNIVERSITY

2011

Bellingham, WA, USA

## Research Interests

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My research is primarily concerned with understanding the nature of attention control. My education and experience of working in different research labs has allowed me to approach the study of attention control from various perspectives; experimental, individual differences, and neuroscience. My research interests include but are not limited to:

- The nature of individual differences in attention control
- Tracking the focus of attention with pupillometry and mind wandering reports
- The role of the locus coeruleus norepinephrine system in attention control
- The role of functional connectivity within and between brain networks to individual differences in attention control and higher-order cognitive abilities
- The possibility of training attention

## Submitted and Preprints

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**Tsukahara, J.S., & Engle, R.W.** (under review, 2021). Intelligence and the locus coeruleus-norepinephrine system. *Proceedings of the National Academy of Sciences*

Burgoyne, A.P., Mashburn, C.A., **Tsukahara, J.S., & Engle, R.W.** (under review, 2021). Attention Control and Process Overlap Theory: Searching for Cognitive Processes Underpinning the Positive Manifold. *Intelligence*.

Burgoyne, A.P., Mashburn, C.A., **Tsukahara, J.S., & Engle, R.W.** (under review, 2021). Understanding the Relationship Between Rationality and Intelligence: A Latent-Variable Approach. *Thinking and Reasoning*.

Burgoyne, A.P., Martin, J.D., Mashburn, C.A., **Tsukahara, J.S., Draheim, C., & Engle, R.W.** (2021). Measuring Individual Differences in Working Memory Capacity and Attention Control and Their Contribution to Language Comprehension. In J. S. Schwieter & E. Z. S.Wen (Eds.), *The Cambridge handbook of working memory and language*.

## Journal Articles

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**Tsukahara, J.S., Draheim, C., & Engle, R.W.** (2021). Baseline pupil size is related to fluid intelligence: A reply to Unsworth et al. (2021). *Cognition*, 215. <https://doi.org/10.1016/j.cognition.2021.104826>. **Citations: 0**

**Tsukahara, J.S., & Engle, R.W.** (2021). Is baseline pupil size related to cognitive ability? Yes (under proper lighting conditions). *Cognition*, 211. <https://doi.org/10.1016/j.cognition.2021.104643>. **Citations: 2**

Draheim, C., **Tsukahara, J.S., Martin, J.D., & Engle, R.W.** (2021). A toolbox approach to improving the measurement of attention control. *Journal of Experimental Psychology: General*, 150(2), 242-275. <https://doi.org/10.1037/xap0000343>

Borges, U., Pfannenstiel, M., **Tsukahara**, J., Laborde, S., Klatt, S., & Raab, M. (2021). Transcutaneous vagus nerve stimulation via tragus or cymba conchae : Are its psychophysiological effects dependent on the stimulation area? *International Journal of Psychophysiology*, 161, 64–75. <https://doi.org/10.1016/j.ijpsycho.2021.01.003>. **Citations: 8**

Martin, J., **Tsukahara**, J.S., Draheim, C., Shipstead, Z., Mashburn, C., Vogel, E.K., & Engle, R.W. (2020). The visual arrays task: Visual storage capacity or attention control?. *In Press at Journal of Experimental Psychology: General*.

Burgoyne, A.P., **Tsukahara**, J.S., Draheim, C., Engle, R.W. (2020). Differential and experimental approaches to studying intelligence in humans and non-human animals. *Learning and Motivation*. 10.1016/j.lmot.2020.101689. **Citations: 2**

**Tsukahara**, J.S., Harrison, T.L., Draheim, C., Martin, J., & Engle, R.W. (2020). Attention control: The missing link between sensory discrimination and intelligence. *Attention, Perception, & Psychophysics*. <https://doi.org/10.3758/s13414-020-02044-9>. **Citations: 6**

**Tsukahara**, J.S., Harrison, T.L., & Engle, R.W. (2016). The relationship between baseline pupil size and intelligence. *Cognitive Psychology*, 91, 109-123. <http://dx.doi.org/10.1016/j.cogpsych.2016.10.001>. **Citations: 60**

## Chapters

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Mashburn, C.A., **Tsukahara**, J.S., & Engle, R.W. (2020). Individual differences in attention control: Implications for the relationship between working memory capacity and fluid intelligence. In R.H. Logie, V. Camos, & N. Cowan (Eds.), *Working memory: The state of the science*. Oxford University Press. <http://dx.doi.org/10.1093/oso/9780198842286.003.0007>. **Citations: 1**

## Popular Writing and Interviews

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**Tsukahara**, J.S., Burgoyne, A.P., & Engle, R.W. (2021, June 2). Pupil Size Is a Marker of Intelligence, *Scientific American*. Retrieved from [Link to article](#)

**Rose**, J. (2021, July 6). *Pupil Size and Intelligence* [**Radio broadcast**]. BYU Radio Top of Mind. [Link to broadcast](#)

**Mora**, J. (2021, July 4). *It's in your eyes: pupil size a marker of intelligence* [**Radio broadcast**]. Radio New Zealand Sunday Morning. [Link to broadcast](#)

**Mantle**, L. (2021, June 10). *Could the size of one's pupils be an indicator of cognitive ability?* [**Radio broadcast**]. KPCC AirTalk. [Link to broadcast](#)

## Professional Presentations

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**Tsukahara**, J.S., & Engle, R.W. (2019). Individual differences in baseline pupil size: Why lighting conditions matter. **Poster** presented at the 60th Annual meetings of the Psychonomic Society, Montréal, Canada. <https://osf.io/7fntm/>

Draheim, C., **Tsukahara**, J. S., Martin, J. D., Mashburn, C. A., & Engle, R. W. (2019). Attention control is a unitary concept when measured with accuracy-based tasks. **Poster** presented at the 60th annual meeting of the Psychonomic Society, Montréal, Canada.

Draheim, C., Martin, J. D., **Tsukahara**, J.S., Mashburn, C. A., & Engle, R. W. *Measurement of Attention Control* **Paper** presented at the 59th meeting of the Psychonomic Society, New Orleans, LA.

**Tsukahara**, J.S., & Engle, R.W. (2018). Pupil size as an indicator of arousal and task focus. **Poster** presented at the 59th Annual meetings of the Psychonomic Society, New Orleans, LA.

**Tsukahara**, J.S., Harrison, T. L., Hicks, K. L., Draheim, C., Martin, J. D., & Engle, R. W. (November 2017). *Measuring attention control: Can we do better?* **Poster** presented at the 58th annual meeting of the Psychonomic

Society, Vancouver, Canada.

Harrison, T. L., Hicks, K. L., Draheim, C., **Tsukahara**, J.S., & Engle, R. W. (November, 2016). *Sensory discrimination, working memory, and fluid intelligence*. **Paper** presented by Engle, R.W. at the 57th annual meeting of the Psychonomic Society, Boston, MA.

**Tsukahara**, J.S., & Engle, R.W. (November, 2016). *Mind wandering in low and high demanding tasks: Frequency vs. degree of disengagement*. **Poster** presented at the 57th annual meeting of the Psychonomic Society, Boston, MA.

**Tsukahara**, J.S., Harrison T.L. & Engle, R.W. (2016). *More than meets the eye: Converging evidence from pupillometry, locus coeruleus function, and resting-state functional connectivity*. **Paper** presented by Tsukahara, J.S. at the North Georgia Regional Memory Meeting, Atlanta, GA.

**Tsukahara**, J.S., Harrison, T.L., & Engle, R.W. (April, 2016). *More than meets the eye: The relationship between pupil size and intelligence*. **Poster** presented at the Callosum Conference.

**Tsukahara**, J.S., Harrison, T.L., & Engle, R.W. (2015). *The eyes have it: The relationship between pupil size and intelligence*. **Paper** presented by Engle, R.W. at the 56th annual meeting of the Psychonomic Society, Chicago, IL.

**Tsukahara**, J.S., & Koshino, H. (November, 2014). *Does working memory capacity have the same effect on the Simon task as working memory load?* **Poster** presented at the 55th annual meeting of the Psychonomic Society, Long Beach, CA.

Koshino, H., Veltri, G.A., **Tsukahara**, J.S., Alderson, E. (November, 2014). *Effects of working memory and perceptual load on Simon interference*. **Poster** presented at the 55th annual meeting of the Psychonomic Society, Long Beach, CA.

**Tsukahara**, J.S. (2014, June). *The effect of working memory capacity and working memory load on the Simon task*. **Paper** presented at the 1st annual Learning Research Institute conference, California State University, San Bernardino, CA.

**Tsukahara**, J.S. (2014, June). *Perceptual load effect in the Simon task*. **Paper** presented at the 3rd annual student Research Symposium "Meeting of the Minds," California State University, San Bernardino, CA.

**Tsukahara**, J.S., Rivera, L., & Koshino, H. (April, 2014). *The effects of perceptual load on a Simon task*. **Poster** presented at the 94th annual Western Psychological Association convention, Portland, OR.

Koshino, H., **Tsukahara**, J.S., Rivera, L. Veltri, G.A., Cross, T., Alderson, E. (April, 2014). *Effects of perceptual load and working memory on a Simon task*. **Poster** presented at the 94th annual Western Psychological Association convention, Portland, OR.

Koshino, H. & **Tsukahara**, J.S. (November, 2013). *Relative effectiveness of attention capture between color singleton and working memory*. **Poster** session presented at the 54th annual meeting of the Psychonomic society, Toronto, Canada.

**Tsukahara**, J.S., Banerjee, S., & Koshino, H. (April, 2013). *Interaction between Simon and Flanker effects*. **Poster** session presented at the 93rd annual Western Psychological Association convention, Reno, NV.

## Teaching Experience

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### PRIMARY INSTRUCTOR

#### **PSYC 6020: Graduate Level Statistics II Lab**

TAUGHT REGRESSION AND GENERAL LINEAR MODEL IN R AND SPSS; COURSE DESIGN; WEEKLY LABS

Georgia Institute of Technology

Spring 2019

#### **Intro to Experimental Psychology Lab Section**

TAUGHT EXPERIMENTAL DESIGN, MANUSCRIPT WRITING IN APA FORMAT, OVERSAW STUDENT EXPERIMENTS

California State University

Spring 2013 - Spring 2014

### SECONDDAY INSTRUCTOR

## Introduction to Psychology

TEACHING PRACTICUM; GUEST LECTURE: RESEARCH METHODOLOGY, ATTENTION AND CONSCIOUSNESS, THINKING AND INTELLIGENCE

Georgia Institute of Technology

Fall 2016

## Guest Lecture: Introduction to I/O Psychology

LECTURED ON AN INTRODUCTION TO RESEARCH ON INTELLIGENCE

Georgia Institute of Technology

Fall 2017

## Supplemental Instructions to Psychological Statistics

PROVIDED ADDITIONAL INSTRUCTION IN UNDERGRADUATE LEVEL STATISTICS

California State University

Winter 2013 - Spring 2013

# Open-Source Software and Website Management

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## R PACKAGES

### pupillometry

AN R PACKAGE TO PREPROCESS PUPIL DATA

<https://dr-jt.github.io/pupillometry>

### semoutput

AN R PACKAGE TO CREATE NICE LOOKING OUTPUT FOR CFA AND SEM ANALYSIS USING LAVAAN AND SEMPLLOT

<https://dr-jt.github.io/semoutput>

### englelab

AN R PACKAGE FOR PROCESSING COMPLEX-SPAN AND ATTENTION CONTROL TASKS DOWNLOADED FROM THE ENGLELAB

<https://englelab.github.io/englelab/>

## WEBSITE MANAGEMENT

### Attention and Working Memory Lab Website

DESIGN AND MANAGE LAB WEBSITE

<https://englelab.gatech.edu>

# Technical Skills

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## RESEARCH METHODS

*My primary experience is in design of research experiments using both individual differences and experimental approaches, as well as designing experiments to measure baseline and task-evoked changes in pupil size.*

Individual differences

Functional magnetic resonance imaging (fMRI)

Experimental manipulation

Electroencephalography (EEG)

Pupillometry

## STATISTICAL METHODS

General linear model (Regression, ANOVA)

Structural equation modelling

Factor analysis (Principal components, Exploratory factor analysis)

Multilevel modelling

## PROGRAMMING

*My primary programming experience is in creating experimental tasks, data management and processing, statistical analysis, and website design.*

### Experimental Tasks

E-Prime

### Data Management and Analysis

R (see open-source software section)

PsychoPy

SPSS (statistical analysis tool)

### Website and Graphic Design

HTML; CSS

Adobe Illustrator; Adobe Lightroom

# Graduate Coursework

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Cognitive Psychology

Statistical Analysis I (ANOVA)

Intelligence (*seminar*)  
Neuroimaging (*seminar*)  
Life-Span Developmental Psychology  
Biopsychology  
Transcranial Magnetic Stimulation (*seminar*)  
Teaching Practicum  
Learning and Motivation  
Personal and Social Psychology

Statistical Analysis II (*regression*)  
Multivariate Statistics  
Psychometric Theory  
Structural Equation Modeling  
Psychological Testing  
Research Methods

## **Professional Service**

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### **Peer-reviewed for:**

*International Journal of Psychophysiology*  
*Gerontology*  
*Psychological Science*  
*Psychophysiology*  
*Psychonomic Bulletin and Review*  
*Journal of Experimental Psychology: Learning, Memory, and Cognition*  
*Attention, Perception, and Psychophysics*  
*Biological Psychology*  
*Cognitive, Affective, and Behavioral Neuroscience*  
*Cognition*  
*Journal of Experimental Psychology: General*  
*Current Directions in Psychological Science*  
*Attention, Perception, and Psychophysics*