

# Taylor R. Hayes | CV

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## Education

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### University of California, Davis

Postdoctoral fellow, Center for Mind and Brain

09/2015-Present

### The Ohio State University

Ph.D., Cognitive Psychology

12/2014

### The Ohio State University

M.A., Cognitive Psychology

03/2011

### The Ohio State University

B.A., Philosophy

06/2006

## Research Interests

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### Visual Cognition

Attentional control during scene perception and relational reasoning

### Individual Differences

How individual differences modulate attentional control

### Pupillometry

Using pupillometry as an index of neuromodulatory activity to understand visual cognition

### Computational Cognitive Neuroscience

Biologically plausible neural network models of cognitive systems

## Publications

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Hayes, T. R. & Henderson, J. M. (Submitted). Center bias outperforms image salience but not semantics during scene viewing.

Hayes, T. R. & Henderson, J. M. (Submitted). Scene semantics automatically guide attention during visual search.

Peacock, C. & Hayes, T. R. & Henderson, J. M. (2019). Meaning guides attention during scene viewing even when it is irrelevant. *Attention, Perception, & Psychophysics*, 81(1), 20-34.

Henderson, J. M. & Hayes, T. R. & Rehrig, G. L. & Ferreira, F. (2018). Meaning Guides Attention during Real-World Scene Description. *Scientific Reports*, 8, 1-9.

Henderson, J. M. & Hayes, T. R. (2018). Meaning guides attention in real-world scene images: Evidence from eye movements and meaning maps. *Journal of Vision*, 18(10), 1-18.

Hayes, T. R. & Henderson, J. M. (2018). Scan patterns during real-world scene viewing predict individual differences in clinical traits in a normative sample. *PLoS ONE*, 13(5):e0196654.

Henderson, J. M. & Hayes, T. R. (2017). Meaning-based guidance of attention in scenes as revealed by meaning maps. *Nature Human Behavior*, 1, 743-747.

Hayes, T. R. & Henderson, J. M. (2017). Scan patterns during real-world scene viewing predict individual differences in cognitive capacity. *Journal of Vision*, 17(5):23, 1-17.

- Hayes, T. R. & Petrov, A. A. (2016). Pupil diameter tracks the exploration-exploitation trade-off during analogical reasoning and explains individual differences in fluid intelligence. *Journal of Cognitive Neuroscience*, 28(2), 308-318.
- Hayes, T. R. & Petrov, A. A. (2016). Mapping and correcting the influence of gaze position on pupil size measurements. *Behavior Research Methods*, 48(2), 1-18.
- Hayes, T. R. & Petrov, A. A. & Sederberg, P. B. (2015). Do we really become smarter when our fluid-intelligence test scores improve? *Intelligence*, 48, 1-14.
- Hayes, T. R. & Petrov, A. A., & Sederberg, P. B. (2011). A novel method for analyzing sequential eye movements reveals strategic influence on Raven's Advanced Progressive Matrices. *Journal of Vision*, 11(10):10, 1-11.
- Petrov, A. A. & Hayes, T. R. (2010). Asymmetric transfer of perceptual learning of luminance- and contrast-modulated motion. *Journal of Vision*, 10(14):11, 1-22.

## Conference Presentations

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- Hayes, T. R. & Henderson, J. M. (2018). Scene meaning and salience are suppressed during arbitrary visual search. In *Proceedings of the 18th Annual Meeting of the Vision Sciences Society*, 21.15.
- Hayes, T. R. & Henderson, J. M. (2017). The Relationship Between Salience and Meaning During Real-World Scene Viewing. In *Proceedings of the 17th Annual Meeting of the Vision Sciences Society*, 26.4023.
- Hayes, T. R. & Henderson, J. M. (2017). Eye Movement Patterns During Scene Viewing Predict Clinical Individual Differences. In *Proceedings of the 24th Cognitive Neuroscience Society*, F5.
- Hayes, T. R. & Henderson, J. M. (2017). Eye Movement Patterns Among Salient Regions Predict Individual Differences. In *Proceedings of the 57th Annual Meeting of the Psychonomic Society*, 3178.
- Hayes, T. R. & Henderson, J. M. (2016). Eye Movement Patterns Among Salient Regions Predict Individual Differences. In *Proceedings of the 57th Annual Meeting of the Psychonomic Society*, 3178.
- Hayes, T. R. & Henderson, J. M. (2016). Scan Patterns Among Significant Scene Regions Predict Individual Differences. In *Proceedings of the 24th Annual Workshop on Object Perception, Attention, and Memory*, 33.
- Hayes, T. R. & Henderson, J. M. (2016). Eye Movement Patterns During Scene Viewing Predict Individual Differences. In *Proceedings of the 16th Annual Meeting of the Vision Sciences Society*, 26.4071.
- Hayes, T. R. & Petrov, A. A. (2015). Mapping and correcting the influence of gaze position on pupil size measurements. In *Proceedings of the 15th Annual Meeting of the Vision Sciences Society*, 43.3021.
- Hayes, T. R. & Sederberg, P. B. & Siefke, B. & Petrov, A. A. (2014). Pupillometry reveals role for norepinephrine in the isolation effect. *Journal of Vision*, 14(10), 1142.
- Hayes, T. R. & Petrov, A. A. (2013). Pupillometry as a method for tracking shifts in control state during visual relational reasoning. *Journal of Vision*, 13(9), 799.
- Petrov, A. A. & Hayes, T. R. (2013). Phasic locus coeruleus activity changes with practice: A pupillometry study. In *Proceedings of the 10th Annual Meeting of Computational and Systems Neuroscience*, 1475.
- Hayes, T. R. & Petrov, A. A. (2012). Pupil diameter changes systematically and non-monotonically with perceptual learning. In *Proceedings of the 53rd Annual Meeting of the Psychonomic Society*, 3004.
- Hayes, T. R. & Petrov, A. A. (2012). Pupil diameter changes non-monotonically with perceptual learning. *Journal of Vision*, 12(9), 697.
- Petrov, A. A. & Hayes, T. R. & Sederberg, P. B. (2011). Sequential eye-movement analysis reveals strategic processing on Raven's Advanced Progressive Matrices. In *Proceedings of the 51st Annual*

*Meeting of the Psychonomic Society, 237.*

Petrov, A. A. & Hayes, T. R. & Sederberg, P. B. (2011). Sequential eye-movement analysis reveals strategic processing on Raven's Advanced Progressive Matrices. In *Proceedings of the 44th Annual Meeting of the Society for Mathematical Psychology*, 52.

Petrov, A. A. & Hayes, T. R. & Sederberg, P. B. (2011). Learning affects strategic processing on Raven's Advanced Progressive Matrices. In *Proceedings of the 44th Annual Conference of the Cognitive Science Society*, 3395.

Hayes, T. R. & Sederberg, P. B. & Petrov, A. A. (2011). A new technique for the analysis of sequential eye movements. *Journal of Vision*, 11(11), 501.

Hayes, T. R. & Petrov, A. A. (2009). Asymmetrical transfer of perceptual learning between Luminance- and Contrast-Defined motion: Evidence for shared and distinct processing. In *Proceedings of the 50th Annual Meeting of the Psychonomic Society*, 5095.

Hayes, T. R. & Petrov, A. A. (2009). Perceptual learning transfers from luminance- to contrast-defined motion. *Journal of Vision*, 9(8), 884.

## Programming and Technical Experience

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### Programming, 10+ years experience

*Matlab, Python, R*

Numerous experiments written in Matlab and the Psychophysics Toolbox or Python and PsychoPy. Extensive statistical analysis and data modeling in Matlab, Python, and R.

### Eye Tracking, 10+ years experience

*EyeLink 1000 eye tracker, EyeLink Toolbox, Experiment Builder, Data Viewer*

Extensive experience implementing and running eye tracking experiments via Matlab and Python.

### fMRI

*Siemens 3T Trio, Brain Voyager*

Group seminar in fMRI that involved designing, implementing, and running an fMRI experiment and the subsequent analysis of the data within Brain Voyager.

### OS

*MacOS, Linux, Microsoft*

### Publishing

*TEX, L<sup>A</sup>T<sub>E</sub>X, Omnigraffle*

## Research Awards

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### Psychonomic Society Clifford T. Morgan Best Article Award: Behavior Research Methods

*Mapping and correcting the influence of gaze position on pupil size measurements* 2016

### OSU Graduate Student Conference Presentation Award

*Travel award to present research at the 13th annual meeting of the Vision Sciences Society* 2014

### Graduate Student Research Excellence Award

*Summer research fellowship awarded to top 15 graduate students for outstanding research ability* 2014

### James Mosher Klein Award

*Awarded to the most outstanding dissertation proposal within the Cognitive Psychology department* 2013

### Presidential Fellowship

*The most prestigious award given by the Graduate School to recognize outstanding scholarship* 2013

### Herbert Toops Award

*Award for the most outstanding article published by a graduate student in the Psychology department* 2012

<b>Graduate Student Research Excellence Award</b>	
<i>Summer research fellowship awarded to top 15 graduate students for outstanding research ability</i>	2012
<b>OSU Graduate Student Conference Presentation Award</b>	
<i>Travel award to present research at the 12th annual meeting of the Vision Sciences Society</i>	2012
<b>Graduate Student Research Excellence Award</b>	
<i>Summer research fellowship awarded to top 15 graduate students for outstanding research ability</i>	2011
<b>Center for Cognitive Science Travel Award</b>	
<i>Travel award to present research at the 34th annual meeting of the Cognitive Science Society</i>	2011
<b>OSU Graduate Student Conference Presentation Award</b>	
<i>Travel award to present research at the 50th annual meeting of the Psychonomic Society</i>	2010
<b>OSU Graduate Student Conference Presentation Award</b>	
<i>Travel award to present research at the 9th annual meeting of the Vision Sciences Society</i>	2009

## Professional Activities

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### Scientific Memberships

*Vision Sciences Society, Psychonomic Society*

### Attended Conferences and Workshops:

Vision Sciences Society Proceedings (2018)

Vision Sciences Society Proceedings (2017)

Cognitive Neuroscience Society Proceedings (2017)

Psychonomic Society Proceedings (2016)

Object Perception, Attention, and Memory Proceedings (2016)

Vision Sciences Society Proceedings (2016)

Vision Sciences Society Proceedings (2015)

Vision Sciences Society Proceedings (2014)

Vision Sciences Society Proceedings (2013)

Mathematical Biosciences Institute Cognitive Neuroscience Workshop (2012)

Psychonomic Society Proceedings (2012)

Society for Mathematical Psychology Proceedings (2012)

Vision Sciences Society Proceedings (2012)

Psychonomic Society Proceedings (2011)

Cognitive Science Society Proceedings (2011)

Society for Mathematical Psychology Proceedings (2011)

Vision Sciences Society Proceedings (2011)

Psychonomic Society Proceedings (2010)

Vision Sciences Society Proceedings (2009)

### Ad-hoc Reviewer:

Nature

Journal of Experimental Psychology: General

Vision Research

PLoS ONE

Attention, Perception, & Psychophysics

## Teaching Experience

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### University of California, Davis

*Guest Lecturer*

2016

Psych 131: Perception

### The Ohio State University

*Graduate Lecturer (3 sections)*

2013

Psych 100: Introduction to Psychology

### The Ohio State University

*Guest Lecturer*

2012

Psych 312: Memory and Cognition

### The Ohio State University

*Graduate Lecturer (3 sections)*

2011–2012

Psych 100: Introduction to Psychology

### The Ohio State University

*Graduate Lecturer (3 sections)*

2009–2010

Psych 100: Introduction to Psychology

### The Ohio State University

*Teaching Associate*

Summer 2009

Psych 313: Introduction to Behavioral Neuroscience

### The Ohio State University

*Teaching Associate*

2008–2009

Psych 220: Introduction to Behavioral Statistics