

Richard P. Heitz • Curriculum Vitae

August 16, 2011

Contact

Department of Psychology
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Education

Ph.D (2007); Georgia Institute of Technology

Dissertation: *Neural correlates of speed-accuracy tradeoff: An electrophysiological analysis*

M.S. (2003); Georgia Institute of Technology

Specialization: Cognitive Psychology

Minor: Quantitative/Statistics

Advisor: Dr. Randall W. Engle

B.A. (2000); University of Illinois at Chicago

Specialization: Cognitive Psychology

Advisor: Dr. Andrew R. A. Conway

Professional Experience

2011 – Research Assistant Professor, Vanderbilt University

2007 – 2011 Post-Doctoral NEI Research Fellow, Center for Integrative and Cognitive Neuroscience and Vanderbilt Vision Research Center, Vanderbilt University, Advisor: Jeffrey D. Schall, Ph.D.

2001 – 2007 Research Associate, School of Psychology, Georgia Institute of Technology, Advisor: Randall W. Engle, Ph.D.

1999 – 2001 Research Assistant, Department of Psychology, University of Illinois at Chicago, Advisor: Andrew R. A. Conway, Ph.D.

1999 – 2000 Research Assistant, Department of Psychology, University of Illinois at Chicago, Advisor: Linda J. Skitka, Ph.D.

Support

- 2009 – 2011 **National Research Service Award**, National Eye Institute (F32-EY019851A)
Neurophysiological Correlates of Decision Formation: \$153,822 total cost over 3 years.
- 2006 **Georgia Tech Graduate Student Research Award**, \$1,320
- 2005 **Georgia Tech Graduate Student Research Award**, \$1,500
- 2005 **APA Dissertation Research Award**, \$1,000
- 2004 **Georgia Tech Graduate Student Research Award**, \$1,000

Peer-reviewed Publications

- Heitz, R. P.**, & Schall, J. D. (2011). Neural correlate of speed-accuracy tradeoff in frontal eye field. (In preparation).
- Heitz, R. P.**, Nelson, M. J., Cohen, J. Y., & Schall, J. D. (2011). Behavioral correlates of gamma-band spike-field coherence in frontal eye field during visual search. (Submitted)
- Schall, J. D., Purcell, B. P., **Heitz, R. P.**, Logan, G. D., & Palmeri, T. J. (2011). Neural mechanisms of saccade target selection: gated accumulator model of the visual-motor cascade. *European Journal of Neuroscience*, *33*, 1991-2002.
- Heitz, R. P.**, Cohen, J. Y., Woodman, G. F., & Schall, J. D. (2010). Neural correlates of correct and errant attentional selection revealed through N2pc and frontal eye field activity. *Journal of Neurophysiology*, *104*, 2433-41.
- Purcell, B. A., **Heitz, R. P.**, Cohen, J. Y., Schall, J. D., Logan, G. D. & Palmeri, T. J. (2010) Neurally constrained modeling of perceptual decision making. *Psychological Review*, *117*, 1113-43.
- Cohen, J. Y., Crowder, E. A., **Heitz, R. P.**, Subraveti, C. R., Thompson, K. G., Woodman, G. F. & Schall, J. D. (2010) Cooperation and competition among frontal eye field neurons during visual target selection. *Journal of Neuroscience*, *30*, 3227-38.
- Cohen, J. Y., **Heitz, R. P.**, Schall, J. D. & Woodman, G. F. (2009). On the origin of event-related potentials indexing covert attentional selection during visual search. *Journal of Neurophysiology*, *102*, 2375-86.
- Cohen, J. Y., Pouget, P., **Heitz, R. P.**, Woodman, G. F., & Schall, J. D. (2009). Biophysical support for functionally distinct cell types in the frontal eye field. *Journal of Neurophysiology*, *101*, 912-916.

- Cohen, J. Y., **Heitz, R. P.**, Woodman, G. F., & Schall, J. D. (2009). Neural basis of the set size effect in frontal eye field: Timing of attention during visual search. *Journal of Neurophysiology*, *101*, 1699-1704.
- Unsworth, N., Redick, T. S., **Heitz, R. P.**, & Broadway, J. B., & Engle, R. W. (2009). Complex working memory span tasks and higher-order cognition: A latent variable analysis of the relationship between processing and storage, *Memory*, *17*, 635-654.
- Liu, S., **Heitz, R. P.**, Sampson, A. R., Zhang, W., & Bradberry, C. W. (2008). Evidence of temporal cortical dysfunction in rhesus monkeys following chronic cocaine self-administration. *Cerebral Cortex*, *18*, 2109-16.
- Unsworth, N., **Heitz, R. P.**, & Parks, N. A. (2008). The importance of temporal distinctiveness for forgetting over the short term. *Psychological Science*, *19*, 1078-81.
- Liu, S., **Heitz, R. P.**, & Bradberry, C. W. (2008). A touch screen based stop signal response task in rhesus monkeys for studying impulsivity associated with chronic cocaine self-administration. *Journal of Neuroscience Methods*, *177*, 67-72.
- Heitz, R. P.**, & Engle, R. W. (2007). Focusing the spotlight: Individual differences in visual attention control. *Journal of Experimental Psychology: General*, *136*, 217-240.
- Heitz, R. P.**, Schrock, J. C., Payne, T. W., & Engle, R. W. (2007). Effects of incentive on working memory capacity: Behavioral and pupillometric data. *Psychophysiology*, *45*, 119-129.
- Pouget, P., Nelson, M., Cohen, J., & **Heitz, R. P.** (2007). Pulse-pattern sensitivity in the frontal eye field of the macaque monkey. *Journal of Neuroscience*, *27*, 11780-11781.
- Unsworth, N., **Heitz, R. P.**, Shrock, J. C., & Engle, R. W. (2005). An automated version of the operation span task. *Behavior Research Methods, Instruments, and Computers*, *37*, 498-505.
- Bunting, M. F., Conway, A. R. A., & **Heitz, R. P.** (2004). Individual differences in the fan effect and working memory capacity. *Journal of Memory and Language*, *51*, 604-622.

Book Chapters and Commentaries

- Schall, J. D., Purcell, B. A., **Heitz, R. P.**, Logan, G. D., & Palmeri, T. J. Neural mechanisms of saccade target selection: Gated accumulator model of visual-motor cascade. *European Journal of Neuroscience*.
- Cohen, J. Y., **Heitz, R. P.**, Woodman, G. F., & Schall, J. D. (2009). Reply to Balan and Gottlieb. *Journal of Neurophysiology*, *102*, 1342-43.

Heitz, R. P., Redick, T. S., Hambrick, D. Z., Kane, M. J., Conway, A. R. A., & Engle, R. W. (2006). WM, EF, and gF are not the same. *Behavioral and Brain Sciences*, *29*, 135-136.

Heitz, R. P., Unsworth, N., & Engle, R. W. (2005). Working memory capacity, attention control, and intelligence. In O. Wilhelm & R. W. Engle (Eds.), *Understanding and measuring intelligence*. NY: Sage.

Unsworth, N., **Heitz, R. P.**, & Engle, R. W. (2005). Working memory capacity in hot and cold cognition. In R. W. Engle, G. Sedek, U. Hecker, & D. N. McIntosh (Eds.), *Cognitive limitations in aging and psychopathology* (pp. 19-43). New York: Oxford University Press.

Redick, T. S., **Heitz, R. P.**, & Engle, R. W. (2007). Working memory capacity and inhibition: Cognitive and social consequences. In D. S. Gorfein & C. M. MacLeod & (Eds.), *Inhibition in cognition*. Washington, DC: American Psychological Association.

Conference Presentations

Heitz, R. P., & Schall, J. D. (2011, November). *Neural correlate of speed-accuracy tradeoff in frontal eye field*. Talk presented at the annual meeting of the Society for Neuroscience, Washington, D.C.

Howell-Young, M. S., **Heitz, R. P.**, Purcell, B. A., Schall, J. D., & Woodman, G. F. (2011, May). *Source localization of an event-related potential indexing covert shifts of attention in macaques*. Poster presented at the annual meeting of the Vision Sciences Society, Naples, FL.

Heitz, R. P., Nelson, M. J., Cohen, J. Y., & Schall, J. D. (2010, November). *Functional role of gamma-band spike-field coherence in frontal eye field during visual target selection*. Poster presented at the annual meeting of the Society for Neuroscience, San Diego.

Howell-Young, M. S., **Heitz, R. P.**, Schall, J. D., & Woodman, G. F. (2010, November). *Modeling the neural generators of monkey event-related potentials indexing covert shift of attention*. Poster presented at the annual meeting of the Society for Neuroscience, San Diego.

Purcell, B. A., **Heitz, R. P.**, Schall, J. D., Logan, G. D., & Palmeri, T. J. (2010, November). *Multiple-accumulator model of decision making during visual search*. Poster presented at the annual meeting of the Society for Neuroscience, San Diego.

Palmeri, T. J., Purcell, B. A., **Heitz, R. P.**, Schall, J. D., & Logan, G. D. (2010, November). *Neurally-constrained multiple-accumulator model of perceptual decision making*. Talk presented

at the annual meeting of the Psychonomic Society, St. Louis.

Purcell, B. A., **Heitz, R. P.**, Cohen, J. Y., & Schall, J. D. (2010, May). *Timing of attentional selection in frontal eye field and event-related potentials over visual cortex during pop-out search*. Poster presented at the annual meeting of the Visual Sciences Society, Naples, FL.

Heitz, R. P., Nelson, M. J. Ferguson, K. E., Cohen, J. Y., Woodman, G. F., & Schall, J. D. (2009, October). *Coherence of neurons and networks in frontal eye field*. Poster presented at the annual meeting of the Society for Neuroscience, Chicago.

Ferguson, K. E., **Heitz, R. P.**, Cohen, J. Y., Woodman, G. F., & Schall, J. D. (2009, October). *Saccade endpoint scatter during form visual search*. Poster presented at the annual meeting of the Society for Neuroscience, Chicago.

Cohen, J. Y., **Heitz, R. P.**, Woodman, G. F., & Schall, J. D. (2009, October). *Neural variability in frontal eye field during visual search*. Poster presented at the annual meeting of the Society for Neuroscience, Chicago.

Cohen, J. Y., **Heitz, R. P.**, Denduluri, S., Woodman, G. F., & Schall, J. D. (2009, May). *Frontal eye field activity before form visual search errors*. Poster presented at the annual meeting of the Vision Sciences Society, Naples, FL.

Purcell, B. A., **Heitz, R. P.**, Cohen, J. Y., Logan, G. D., Schall, J. D., & Palmeri, T. J. (2009, May). *Developing a neuromimetic accumulator model of perceptual decisions*. Poster presented at the annual meeting of the Vision Sciences Society, Naples, FL.

Heitz, R. P., Cohen, J. Y., Woodman, G. F., & Schall, J. D. (2009, March). *The effects of set size on neural selection time in frontal eye field*. Poster presented at the annual meeting of the Cognitive Neuroscience Society, San Francisco, CA.

Heitz, R. P., Cohen, J. Y., Woodman, G. F., & Schall, J. D. (2008, November). *The effects of set size on neural selection time in frontal eye field*. Poster presented at the annual meeting of the Society for Neuroscience, Washington D.C.

Cohen, J. Y., **Heitz, R. P.**, Woodman, G. F., & Schall, J. D. (2008, November). *Timing of target selection between visual cortex and frontal eye field*. Poster presented at the annual meeting of the Society for Neuroscience, Washington D.C.

Crowder, E. A., Haitas, J., Cohen, J. Y., **Heitz, R. P.**, Thompson, K. G., Rao, S. C., & Schall, J. D. (2008, November). *Analysis of spike synchrony among macaque frontal eye field neurons during visual search*.

Heitz, R. P., Woodman, G. F., Pouget, P., Cohen, J. Y., & Schall, J. D. (2008, May). *Effects of luminance contrast on visual responses in frontal eye field*. Poster presented at

the annual meeting of the Vision Sciences Society, Naples, FL.

Purcell, B. A., **Heitz, R. P.**, Cohen, J. Y., Logan, G. D., Schall, J. D., & Palmeri, T. J. (2008, May). *Modeling interactions between visually-responsive and movement-related neurons in FEF during saccade visual search*. Poster presented at the annual meeting of the Vision Sciences Society, Naples, FL.

Cohen, J. Y., **Heitz, R. P.**, Schall, J. D., & Woodman, G. F. (2008, May). *Attention in visual cortex occurs earlier than target selection in the frontal eye field*. Poster presented at the annual meeting of the Vision Sciences Society, Naples, FL.

Kerr, D. D., Liu, S., **Heitz, R. P.**, & Bradberry, C. W. (2007, November). *Impulsivity and performance monitoring in rhesus monkeys following long-term cocaine self-administration*. Poster presented at the annual meeting of the Society for Neuroscience, San Francisco, CA.

Redick, T. S., **Heitz, R. P.**, Aguilera-Martinez, A., & Engle, R. W. (2006, November). *Working memory capacity, processing speed, and fluid intelligence: An eye movement analysis*. Poster presented at the annual meeting of the Psychonomic Society, Houston, TX.

Liu, S., Kerr, D., Gurnsey, K., **Heitz, R. P.**, & Bradberry, C. W. (2006, October). *Cognitive dysfunction in rhesus monkeys after chronic cocaine self-administration*. Poster presented at the annual meeting of the Society for Neuroscience, Atlanta, GA.

Bradberry, C. W., & **Heitz, R. P.** (2005, November). *Orbitofrontal cortex dysfunction in compulsive cocaine seeking in the rhesus monkey*. Poster presented at the annual meeting of the Society for Neuroscience, Washington D.C.

Heitz, R. P., Corballis, P. M., Parks, N. A., & Engle, R. W. (2005, April). *Working memory capacity and attention control: A psychophysiological analysis*. Poster presented at the annual meeting of the Cognitive Neuroscience Society, New York.

Heitz, R. P. (2004, July), *Individual differences in visual attention control*. Poster presented at the annual meeting of the American Psychological Association, Honolulu.

Heitz, R. P. (2004, May), *Individual differences in visual attention control*. Talk given at the annual meeting of the Midwestern Psychological Association, Chicago.

Heitz, R. P., & Engle, R. W. (2003, November). *Working memory capacity and visual attention*. Poster presented at the annual meeting of the Psychonomic Society, Vancouver.

Heitz, R. P. (2003, May). *Working memory and mental effort: Data from pupillometry*. Talk given at the annual meeting of the American Psychological Society, Atlanta, GA.

Unsworth, N., Schrock, J. C., **Heitz, R. P.**, & Engle, R. W. (2003, May). *An automatic version of Ospan*. Poster presented at the annual meeting of the American Psychological Society, Atlanta, GA.

Heitz, R. P. (2003, May). *Working memory and mental effort: Data from pupillometry*. Talk given at the annual meeting of the Midwestern Psychological Association, Chicago, IL.

Bunting, M. R., Conway, A. R. A., & **Heitz, R. P.** (2002, May). *Individual differences in the fan effect: Capacity or control?* Poster presented at the annual meeting of the Midwestern Psychological Association, Chicago, IL.

Heitz, R. P., Payne, T. W., Schrock, J. C., & Engle, R. W. (2002, April). *Working memory and motivation*. Poster presented at the Cognitive Science Student Conference at Emory University. Atlanta, Georgia.

Rosenblatt, B. L., Skitka, L. J., & **Heitz, R. P.** (2001, June). *When do people prefer action to inaction?* Poster presented at the annual meeting of the American Psychological Society: Toronto, Ontario, Canada.

Rosenblatt, B. L., **Heitz, R. P.**, & Skitka, L. J. (2001, May). *Does providing multiple-choice options for verbal insight problems guarantee solution?* Poster presented at the annual meeting of the Midwestern Psychological Association. Chicago, IL.

Teaching Experience

- Undergraduate Statistics Professor (Vanderbilt; Summer 2011; **no ratings**).
- Undergraduate Statistics Professor (Vanderbilt; Summer 2010; rating = **4.9 / 5.0**).
- Undergraduate Applied Statistics Professor (Georgia Tech; Spring 2007; rating = **4.9 / 5.0**).
- Graduate Statistics Lab Instructor (Georgia Tech; Fall 2006; rating = **4.8 / 5.0**).
- Undergraduate Statistics Lab Instructor (Georgia Tech; Spring 2006; rating = **4.8 / 5.0**).
- Graduate Statistics Lab Instructor (Georgia Tech; Fall 2005; rating = **4.7 / 5.0**).
- Seminar on programming in E-Prime (Georgia Tech; 2003 – 2006; 6 sessions).

Ad-hoc Reviewer

- Cognitive, Affective, and Behavioral Neuroscience • Canadian Journal of Cognitive Psychology • Cognitive Psychology • European Journal of Cognitive Psychology • Experimental Brain Research • Journal of Educational Psychology • Memory & Cognition • Neuropsychologia • Perceptual & Motor Skills • Quarterly Journal of Experimental Psychology • Current Directions in Psychological Science • Frontiers in Cognition

Consulting

- Statistical Consultant for Dr. Jagdeep Bijwadia, University of Minnesota and Regions Hospital. “The Effect of Resident Work Schedule on Working Memory Capacity” (2006-2007).
- Consultant/Programmer for Dr. Charles W. Bradberry, University of Pittsburgh. “CNS Consequences of Chronic Cocaine Self-Administration,” funded by the National Institute of Drug Abuse (2006-2007).

Honors

- Vanderbilt University Medical Center ‘Elevate’ award, 2009
- Outstanding Graduate Student award, Georgia Tech, 2007
- Georgia Tech CETL/BP teaching award, 2006 (nomination)
- Hirschberg Memorial Literary Award, 2000 (nomination)

Thesis Supervision

- Kathryn Ferguson (Vanderbilt) – *Saccade endpoint scatter during form visual search* (2008-2010)

Affiliations

- Society for Neuroscience (SfN)
- Cognitive Neuroscience Society (CNS)

Service

- Organized Cognitive Seminar series, 2006-2007.
- Co-author of *Graduate Student Corner* in the APA Division 3 newsletter, 2004-2005.
- Graduate student representative on the cognitive job search committee, 2002-2003.

References

Jeffrey D. Schall

Vanderbilt University
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Vanderbilt University
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Gordon D. Logan

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Andrew J. Tomarken

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Andrew R. A. Conway

Princeton University
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