

Curriculum Vitae Eliot Hazeltine

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Educational and Professional History

Education

Ph.D. University of California, Berkeley
 Psychology, 1998

B. Sci. Harvard University
 Psychology, 1990

Professional and Academic Positions

2003-present Assistant Professor, University of Iowa

1999-2003 Research Scientist, NASA-Ames Research Center

1998-1999 Post-Doctoral Fellow, Stanford University

1992-1997 Research Assistant, University of California, Berkeley

Honors and Awards

National Science Foundation Graduate Research Fellowship, 1992-1996

Neural Control of Movement, Travel Award, 1994

Vice Chancellor's Dissertation Research Award, 1997

NIH Research Training Grant (NRSA), 1999-2000

Spotlight Achievement Award (NASA), 2001

Director's Discretionary Fund (Competitive NASA Research Grant), 2002-2003

Distinguished Member, National Society of Collegiate Scholars, 2006

Research

Refereed Publications

* = senior author, major contribution
** = secondary contribution

*** = equal contribution
**** = minor contribution

- **Albert, N., Weigelt, M., Hazeltine, E., Ivry, R. B. (in press). Target selection during bimanual reaching to direct cues is unaffected by the perceptual similarity of the targets. Journal of Experimental Psychology: Human Perception and Performance.**
- *Akçay, C. & Hazeltine, E. (in press). Feature-overlap and conflict monitoring: Two sources of sequential modulations. Psychonomic Bulletin & Review.**
- *Hazeltine, E., Aparicio, P., Weinstein, A., & Ivry, R. B. (in press). Configural Response Learning: the Acquisition of a Nonpredictive Motor Skill. Journal of Experimental Psychology: Human Perception and Performance.
- *Hazeltine, E., Ruthruff, E., & Remington, R. W. (2006). The role of input and output modality pairings in dual-task performance: Evidence for content-dependent central interference. Cognitive Psychology, *52*, 291-345.
- ****Diedrichsen, J., Grafton, S. T., Albert, N., Hazeltine, E., & Ivry, R. B. (2006). Goal-selection and movement-related conflict during bimanual reaching movements. Cerebral Cortex, *16*, 1726-1738.
- *Hazeltine, E. (2005). Response-response compatibility during bimanual movements: Evidence for the conceptual coding of action. Psychonomic Bulletin & Review, *12*, 682-688.
- *Hazeltine, E. & Ruthruff, E. (2006). Modality pairing effects and the response selection bottleneck. Psychological Research, *70*, 504-513.
- **Ruthruff, E., Hazeltine, E., & Remington, R. (2006). Residual Dual-Task Cost after Practice: What Does it Mean? Psychological Research, *70*, 494-503.
- **Ivry, R. B., Diedrichsen, J., Spencer, R., Hazeltine, E., & Semjen, A. (2004). A Cognitive Neuroscience Perspective on Bimanual Coordination and Interference. In Interlimb Coordination, S. Swinnen & J. Duysens, (Eds.)
- ***Spencer, R. M. C., Hazeltine, E., Semjen, A., & Ivry, R. B. (2004) Goal-based representation in repetitive bimanual movements, International Journal of Sports Psychology, *2*, 239-234.
- *Hazeltine, E., Bunge, S. A., Scanlon, M. D., & Gabrieli, J. D. E. (2003). Material-dependent and material-independent selection processes in the frontal lobes: an event-related fMRI investigation of response selection. Neuropsychologia, *41*, 1208-1217.
- ***Diedrichsen, J., Hazeltine, E., Nurss, W., & Ivry, R. B. (2003). The role of the corpus callosum in the coupling of bimanual isometric force pulses. Journal of Neurophysiology, *90*, 2409-2418.
- *Hazeltine, E., Diedrichsen, J., Kennerley, S., & Ivry, R. B. (2003). Bimanual cross-talk during reaching movements is primarily related to response selection, not the specification of motor parameters. Psychological Research, *67*, 56-70.
- *Hazeltine, E. (2002). Neural structures that support implicit sequence learning. In Attention and Implicit Sequence Learning (pp. 71-107), L. Jimenez (Ed.) Amsterdam: John Benjamins.

- ***Diedrichsen, J., Ivry, R. B., Hazeltine, E., Kennerley, S., & Cohen, A. (2004). Bimanual interference associated with the selection of target locations. Journal of Experimental Psychology: Human Perception and Performance, *29*, 64-77.
- **Keele, S. W., Ivry, R. B., Mayr, U., Hazeltine, E., & Heuer, H. (2003). The cognitive and neural architecture of sequence representation. Psychological Review, *110*, 316-339.
- **Ruthruff, E., Pashler, H. E., & Hazeltine, E. (2003). Dual-task interference with equal task emphasis: Graded capacity-sharing or central postponement? Perception & Psychophysics, *65*, 801-816.
- ***Bunge, S. A., Hazeltine, E., Scanlon, M. D., Rosen, A. C., & Gabrieli, J. D. E. (2002). Dissociable contributions of prefrontal and parietal cortices to response selection. NeuroImage, *17*, 1562-1571.
- ***Grafton, S.T., Hazeltine, E., and Ivry, R.B. (2002). Motor sequence learning with the non-dominant hand: A PET functional imaging study. Experimental Brain Research, *146*, 369-378.
- *Hazeltine, E. (2002). The representational nature of sequence learning: Evidence for goal-based codes. In W. Prinz & B. Hommel (Eds.), Attention and Performance (Vol. XIX, pp. 673-689). Oxford: University Press.
- *Hazeltine, E., Teague, D., & Ivry, R. B. (2002). Simultaneous dual-task performance reveals parallel response selection after practice. Journal of Experimental Psychology: Human Perception and Performance, *28*(3), 527-545.
- **Kennerley, S., Diedrichsen, J., Hazeltine, E., Semjen, A., & Ivry, R. B. (2002). Callosotomy patients exhibit temporal uncoupling during continuous bimanual movements. Nature Neuroscience, *5*, 376-381.
- *Hazeltine, E., & Ivry, R. (2002). Motor Skill. Encyclopedia of the Human Brain, V. Ramachandran (Ed.) San Diego: Academic Press/Elsevier Science.
- ***Diedrichsen, J., Hazeltine, E., Kennerley, S. & Ivry, R. B. (2001). Absence of bimanual interference during directly-cued actions. Psychological Science, *12*, 493-498.
- *Hazeltine, E. (2001). Ipsilateral sensorimotor regions and motor sequence learning. Trends in Cognitive Sciences, *5*, 281-282.
- ***Vuilleumier, P., Sagiv, N., Hazeltine, E., Poldrack, R. A., Swick, D., Rafal, R. D. & Gabrieli, J. D. E. (2001). Neural fate of seen and unseen faces in visuospatial neglect: a combined event-related functional MRI and event-related potential study. Proceedings of the National Academy of Sciences, *98*, 3495-3500.
- **Ivry, R. B. & Hazeltine, E. (2000). Task switching in a callosotomy patient and normal participants: Evidence for response-related sources of interference. In Attention and Performance XVIII, S. Monsell and J. Driver (Eds.), p. 401-423.
- *Hazeltine, E., Poldrack, R., & Gabrieli, J. D. E. (2000). Neural activation during response competition. Journal of Cognitive Neuroscience, *12*, Supplement 2, 118-129.

****Zacks, J. M., Mires, J., Tversky, B., & Hazeltine, E. (2000). Mental spatial transformations of objects and perspective. Spatial Cognition & Computation, 2(4), 315-332.

**Ivry, R. B. & Hazeltine, E. (1999). Subcortical locus of temporal coupling in the bimanual movements of a callosotomy patient. In Human Movement Science, 18, 345-375.

***Grafton, S. T., Hazeltine, E., Ivry, R.B. (1998). Abstract and effector-specific representations of motor sequences identified with PET. Journal of Neuroscience, 18, 9420-9428.

*Hazeltine, E., Helmuth, L.L., Ivry, R.B. (1997). Neural mechanisms of timing. Trends in Cognitive Science, 1, 163-169.

*Hazeltine, E., Grafton, S.T., and Ivry, R. (1997). Attention and stimulus characteristics determine the locus of motor sequence learning: A PET study. Brain, 120, 123-140.

*Hazeltine, E., Prinzmetal, W.P., and Elliot, K. (1997). If it's not there, where is it?: Locating illusory conjunctions. Journal of Experimental Psychology: Human Perception and Performance, 23, 263-277.

**Grafton, S., Hazeltine, E., and Ivry, R. (1995). Functional mapping of sequence learning in normal humans. Journal of Cognitive Neuroscience, 7, 497-510.

****Ivry, R. and Hazeltine, R.E. (1995). The perception and production of temporal intervals across a range of durations: Evidence for a common timing mechanism. Journal of Experimental Psychology: Human Perception and Performance, 21, pp. 1-12.

****Ivry, R. and Hazeltine, R.E. (1992). Models of timing-with-a-timer. In F. Macar, V. Pouthas, and W. Freidman (Eds.) Time, Action, and Cognition. (pp. 183-189). Kluwer Publishers.

Other Publications

*Hazeltine, E., & Ivry, R. B. (2002). Can we teach the cerebellum new tricks. Science, 296, 1979-1980.

*Hazeltine, E. (2002). Focusing on the big picture with fMRI: Consciousness and temporal flux. Journal of Cognitive Neuroscience, 14(6).

***Diedrichsen, J., Hazeltine, E. (2001). Unifying by binding: will binding really bind?: A commentary on Hommel, Müsseler, Aschersleben, and Prinz. Behavioural and Brain Sciences, 24, 884-885.

Invited Addresses and Colloquia

Hazeltine, E. (2004). "Dual-task costs and bimanual interference: Two forms of central crosstalk." Presented at Conference on Bimanual Control, Munich, Germany

Hazeltine, E. (2004). "What can stimulus-response modality pairings and dual-task costs tell us about central processing?" Presented at Conference on Dual-task Performance, Munich, Germany

Hazeltine, E. (2003). "Bimanual reaching movements and code overlap." Presented at Munich Encounter in Cognition and Action, Munich, Germany

Hazeltine, E. (2000). "The representational nature of implicit sequence learning: Evidence for goal-based codes." Presented at Attention and Performance, XIX, Kloster Irsee, Germany

Papers Presented

Hazeltine, E., Akcay, C. & Luck, S. J. (2005). How does a working memory load affect flanker interference?. Presented at the 46th annual meeting of the Psychonomic society, Toronto.

Hazeltine, E. (2004). The representational nature of chord learning. Presented at the 45th annual meeting of the Psychonomic society, Minneapolis, MN.

Hazeltine, E., Bunge, S., & Gabrieli, J.D.E. (2001). Neural mechanisms resolving response competition across different stimulus properties. Presented at the 5th annual meeting of the cognitive neuroscience society, San Francisco, CA.

Hazeltine, E., Poldrack, R., & Gabrieli, J. D. E. (1999). Neural activation during response competition. Presented at the 29th annual meeting of the society for neuroscience, Miami, FL.

Paper under review or under revision

***Hazeltine, E. & Ivry, R. B. (under revision). Parallel response selection after callosotomy.**

***Akcay, C. & Hazeltine, E. (under revision). Feature-overlap and conflict monitoring: Two sources of sequential modulations.**

******Ma, L., Wang, B., Narayana, S., Hazeltine, E., Chen, X., Fox, P., & Xiong, J. (under review). Investigating motor plasticity using functional MRI and structural equation modeling.**

****Esterman, M., Prinzmetal, W., DeGutis, J., Landau, A., Hazeltine, E., Verstynen, T., & Robertson, L. (under review). Different behavior and neural consequences of voluntary spatial attention to faces.**

****Bischoff-Grethe, A., Hazeltine, E., Bergren, L., Ivry, R. B., Grafton, S. T. (under review). The influence of feedback valence in associative learning.**

Teaching and Student Supervision

Courses Taught

Semester & Courses	N	SPOT & ACE Summary Scores (1 = strongly disagree; 6 = strongly agree)										
		Course is well planned & organized	Recommend instructor to other students	Course goals clear	Used good examples	Questions are encouraged	Help is available outside class	Instructor is effective in lecture/discussion	Grading criteria clearly defined	Exams test what is learned	Developed greater appreciation for subject	Physical environment conducive to learning
Fall 2004												
31:016 Intro to Cog. Psych.	220	5.30	5.17	5.36	5.20	5.16	5.57	5.03	5.63	4.92	4.92	5.31
31:185 Research Practicum	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Spring 2005												
31:121 Experimental Methods	30	5.73	5.88	5.69	5.69	6.00	5.88	5.92	5.42	5.25	5.38	5.69
31:331 Seminar in Cog. Neuro.	12	5.91	6.00	6.00	5.91	5.82	5.82	5.91	5.73	5.70	6.00	5.91
31:185 Research Practicum	4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fall 2005												
31:016 Intro to Cog. Psych.	232	5.78	5.79	5.70	5.78	5.30	5.59	5.68	5.71	5.36	5.55	5.51
31:185 Research Practicum	3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Spring 2006												
31:121 Experimental Methods	31	5.69	5.90	5.74	5.74	5.92	5.92	5.78	5.87	5.71	5.76	5.81
31:330 Seminar in Cog. Neuro.	5	5.88	5.88	6.00	5.88	5.88	5.88	6.00	5.88	6.00	5.88	5.88
31:185 Research Practicum	4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fall 2006												
31:331 Seminar in Cog. Neuro.	5	5.88	6.0	6.00	6.00	5.88	6.00	5.88	5.67	5.83	5.55	5.00
31:185 Research Practicum	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Representative Positive Written Evaluations for Non-ACE Courses

Semester/Course	N	Sample of Representative Anonymous <u>Positive</u> Written Evaluations	
Fall 2004			
31:016 Intro. Cognitive Psychology	220	“All material on tests was clearly presented in lecture and clarified with good examples so I could apply knowledge to rests.”	“It was actually interesting, and you can be funny, which made it enjoyable instead of just being told information.”
Spring 2005			
31:121 Experimental Methods	30	“We attacked the information very aggressively. When I read the first article for the class, I remember thinking it was like a foreign language. After taking this class, I feel like I can interpret dense psychological literature with much less difficulty.”	“Active [student] participation was effective. Instead of taking exams and applying concepts, we actually did what we learned.”
31:331 Seminar in Cog. Neuro	12	“[The instructor] always tried to explain every question and idea and respected students’ ideas. I really appreciate that.”	“Really active discussion environment. I don’t think there were any problems in class.”
Fall 2005			
31:016 Intro. Cognitive Psychology	232	“Professor Hazeltine seemed really interested and enthusiastic about the course material, so that made me more interested.”	“very clear examples. Plus, your funny examples. It makes key points more memorable. ... Thank you for a great last semester class.”
Spring 2006			
31:121 Experimental Methods	31	“I felt very comfortable speaking in class, questions and comments were answered well with warm feedback.”	“I thoroughly enjoyed the class. Thanks for making it fun. You have a great way of making the students laugh while teaching. Thanks!”
31:331 Seminar in Cog. Neuro	6	“Overall, it was an ‘encouraging’ environment and I really enjoyed the material. Great class – enjoyed it and learned a lot.”	“The readings all exposed me to something new. [The reading list] was just right.”
Fall 2006			
31:016 Intro. Cognitive Psychology	232	“This was my favorite of [Prof. Hazeltine’s] classes. The readings were the most interesting. You do a great job of answering questions.”	“This class provided the most comfortable environment to talk. You always encourage questions and responded seriously even for a silly question.”

Representative Negative Written Evaluations for Non-ACE Courses

Semester/Course	N	Sample of Representative Anonymous <u>Negative</u> Written Evaluations	
Fall 2004			
31:016 Intro. Cognitive Psych.	220	“You sometimes get really excited about a topic (which is great) but you then go really fast and sometimes mix up the differences in what you’re explaining.” (speaking too fast was a common complaint)	“treat us like undergrads and explain the concepts in an easier way.”
Spring 2005			
31:121 Experimental Methods	30	“[the instructor should] give more lectures/clarification lectures about paper presentations. Possible give background on each paper.”	“Find a way to make those who are not as knowledgeable about cognitive psychology understand the concepts better.”
31:331 Seminar in Cog. Neuro	12	“there was too much reading sometime” [this comment was made by 4 students although 2 said the amount was just right]	“More incentives need to be placed on actually doing the readings” [this comment was also made by 4 students.]
Fall 2005			
31:016 Intro. Cognitive Psychology	232	“I enjoyed the lectures, but if you maybe slowed down while giving them it would be easier to process the information.”	“Go into specific examples a little more to expand on difficult concepts.”
Spring 2006			
31:121 Experimental Methods	31	“Some of the papers were pretty difficult” [comment echoed by 5 other students]	“Sometimes you went a little fast.”
31:331 Seminar in Cog. Neuro	6	“Many of these topics were completely unfamiliar to me, and while I value reading original journal articles, there were times that I wish you had laid down more of a background in the topic before reading them.”	“It seemed like the discussion lagged and some people may have checked out, but the readings were difficult to understand, so if could have been that also.”
Fall 2006			
31:330 Seminar in Cog. Neuro	5	“...better suited for a twice a week class to fully explore the issues.”	“Too much emphasis on [the work of] Prinz. Spend more time on the neurophysiology and biological mechanisms.”

Student Supervision

Degree Objective	Name	Years	Outcome
Ph.D. candidates:	Caglar Ackay	2	M.A.
	Kimberley Halversen	1	

*Note: I have supervised between 1-5 undergraduate students in my laboratory since Fall of 2003.

Research Advisory Committee Service

Po-Han Lin
Ian Rasmussen

Support

Ongoing Research Support

None

Pending Research Support

NIH R01 7351286 PI: Hazeltine 9/01/07-8/31/11 25%

How practice and modality pairings alter central operations

This project examines how practice and modality pairing change central operations and whether the structure of WM processes plays a major role in dual-task costs.

NSF 0718327 (PI: Schumacher, Hazeltine) 8/01/07-7/31/09 25%

Collaborative Research: Fractionating the Central Executive: Are the Same Control Processes Engaged across Different Tasks and Different Modalities?

This project examines executive control processes across a range of tasks and stimulus inputs to determine whether a unitary cognitive control process is engaged by diverse task demands.

Role: PI

Completed Research Support

NIH R01 NS33504 PI: Grafton (Dartmouth College) 2/01/03-1/31/07 25%

NINDS 25,000

Functional substrates of long-term motor learning

This project examined the neural substrates of skill acquisition in neurologically healthy individuals using functional magnetic resonance imaging (fMRI).

Role: Collaborator

Service

Departmental Service

Technology Committee	Fall 04 –
BCN Faculty Search	Fall 04 – Spring 05
Neurosciences Admissions Committee	Spring 05

Professional Service

Review service: Journals

Consulting editor for:

Journal of Experimental Psychology: Learning, Memory, & Cognition

Psychonomic Bulletin & Review

Ad hoc reviewer for

Attention & Performance

European Journal of Neuroscience

Journal of Cognitive Neuroscience

Journal of Experimental Psychology: Human Perception, & Performance

Nature

Neuropsychologia

Neuropsychology

Quarterly Journal of Experimental Psychology

Science

Review service: Granting Agencies

Ad hoc reviewer for the National Institute of Health

Ad hoc reviewer for the National Science Foundation

Ad hoc reviewer for the Air Force Office of Scientific Research