

Bruce D. Burns

Addresses

Office: Department of Psychology Michigan State University East Lansing, MI 48824-1117 <i>Telephone:</i> (517) 353-6662 <i>Fax:</i> (517) 353-1652 <i>e-mail:</i> burnsbr@MSU.EDU <i>webpage:</i> www.msu.edu/~burnsbr	Home address: 501 Rampart Way #303 East Lansing, MI 48823 <i>Telephone:</i> (517) 336-5100
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Current Position

Assistant Professor, Department of Psychology, Michigan State University, 1998 to present.

Education

Postdoctoral Fellow: Universität Potsdam, Germany, 1996 –1998
University of California, Los Angeles, 1994 - 1996

Ph.D. in Psychology: University of California, Los Angeles, 1994.
Major: Cognitive Psychology
Minor: Artificial Intelligence
Thesis title: Representations in analogical problem solving
Advisor: Keith J. Holyoak

M.A. in Psychology: University of California, Los Angeles, 1990
Major: Cognitive Psychology
Advisor: Keith J. Holyoak

Bachelor of Science (honors): University of Melbourne, Australia,
First-class honors in Psychology, 1987.

Summary of Research Interests

Knowledge representation in thinking; causality and reasoning, decision making and streaks, learning in complex problem solving; analogical reasoning; cognitive processes in competition; cognition and motivation, behavioral economics.

Summary of Teaching Interests

Cognitive psychology; higher-order cognition; introductory psychology, computational modeling, research methods and analysis.

Publications

- Burns, B. D. (in press). The effects of speed on skilled chess performance. *Psychological Science*.
- Burns, B. D. (in press). Experimental Law? Lessons from experimental economics on applying psychological research to the law. *Michigan State DCL Law Review*.
- Burns, B. D., & Wieth, M. (in press) The Collider principle in causal reasoning: Why the Monty Hall dilemma is so hard. *Journal of Experimental Psychology: General*.
- Burns, B. D. (2004). Heuristics as beliefs and as behaviors: The adaptiveness of the "hot hand". *Cognitive psychology*, 48, 295-331.
- Burns, B. D., & Corpus, B. (2004). Randomness and inductions from streaks: "Gambler's fallacy" versus "Hot hand." *Psychonomic Bulletin & Review*, 11, 179-184.
- Burns, B. D., & Vollmeyer, R. (2002). Goal specificity and dual-space search theories of problem solving. *The Quarterly Journal of Experimental Psychology*, 55A, 241-261.
- Vollmeyer, R., & Burns, B. D. (2002). Goal Specificity and Learning with a Hypermedia Program. *Experimental Psychology*, 49, 98-108.
- Rheinberg, F., Vollmeyer, R., & Burns, B. D. (2001). FAM: Ein Fragebogen zur Erfassung aktueller Motivation in Lern- und Leistungssituationen [QCM: A questionnaire to assess current motivation in learning situations]. *Diagnostica*, 47, 57-66.
- Rheinberg, F., Vollmeyer, R. & Burns, B. D. (2000). Motivation and self-regulated learning. In J. Heckhausen (Ed.), *Motivational psychology of human development* (pp. 81-108). North-Holland: Elsevier.
- Burns, B. D. (1999). Analoges Denken [Analogical thinking]. In A. Ziegler, H. Gruber, & W. Mack (Eds.), *Denken und Wissen* [Thought and knowledge] (pp. 75-100). Opladen, Germany: Westdeutscher Verlag.
- Vollmeyer, R., & Burns, B. D. (1999). Hypothesentesten und Problemlösen [Hypothesis testing and problem solving]. In A. Ziegler, H. Gruber, & W. Mack (Eds.), *Denken und Wissen* [Thought and knowledge] (pp. 101-118). Opladen, Germany: Westdeutscher Verlag.
- Burns, B. D., & Vollmeyer, R. (1998). Modeling the adversary in competition. *Journal of Personality and Social Psychology*, 75, 711-718.
- Burns, B. D. (1998). Pragmatic effects on speed of analogical problem solving. In K. Holyoak, D. Gentner, & B. Kokinov (Eds.), *Advances in analogy research: Integration of theory and data from cognitive, computational, and neural sciences* (pp. 201-209). Sofia, Bulgaria: New Bulgarian University.
- Vollmeyer, R., & Burns, B. D. (1996). Hypotheseninstruktion und Zielspezifität: Bedingungen die das Erlernen und Kontrollieren eines komplexen Systems beeinflussen. [Hypothesis-instruction and goal-specificity: Factors that influence the learning and controlling of a complex system]. *Zeitschrift für Experimentelle Psychologie*, 43, 657-683.
- Burns, B. D. (1996). Meta-analogical transfer: Transfer between episodes of analogical reasoning. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 22, 1032-1048.
- Vollmeyer, R., Burns, B. D., & Holyoak, K. J. (1996). The impact of goal specificity and systematicity of strategies on the acquisition of problem structure. *Cognitive Science*, 20, 75 - 100.
- Burns, B. D. (1995, fall). Review of "Fluid Concepts and Creative Analogies" by Douglas Hofstadter. *AI Magazine*, 16, 81-83.
- Burns, B. D. (1994). Analogy programs and creativity. *Behavioral and Brain Sciences*, 17, 535. (commentary)

- Hummel, J. E., Burns, B. D., & Holyoak, K. J. (1994). Analogical mapping by dynamic binding: Preliminary investigations. In K. J. Holyoak & J. A. Barnden (Eds.), *Advances in connectionist and neural computation theory, Vol. 2: Analogical connections* (pp. 416-445). Norwood, NJ: Ablex.
- Summers, J. J., Rosenbaum, D. A., Burns, B. D., & Ford, S. K. (1993). Production of polyrhythms. *Journal of Experimental Psychology: Human Perception and Performance*, *19*, 416-428.
- Summers, J. J., & Burns, B. D. (1990). Timing and human movement sequences. In N. Block (Ed.), *Cognitive theories of time* (pp. 181-206). Hillsdale, NJ: Lawrence Erlbaum.
- Burns, B. D., & Summers, J. J. (1989). Strategies and motor programs. *Behavioral and Brain Sciences*, *12*, 214. (commentary)
- Summers, J. J., Bell, R., & Burns, B. D. (1989). Perceptual and motor factors in the imitation of simple temporal patterns. *Psychological Research*, *50*, 23-27.

Papers under review or revision

- Gernaat, E. P., & Burns, B. D. (under revision). The recognition heuristic is real, but explicit information mediates its use. *Cognition*.
- Wieth, M., & Burns, B. D. (under review). Influence of motivation on insight and non-insight problem solving. *Memory & Cognition*.
- Burns, B. D., & McFarlane, D. (under revision). Webpages without a server as general experimental software. *Behavior Research Methods, Instruments, & Computers*.
- Burns, B. D., & Vollmeyer, R. (under revision). Competition as adversarial problem solving: A test of modeling the opponent and game theory. *Cognitive Science*.

Publications in Refereed Conference Proceedings

- Burns, B. D. (2003). When it is adaptive to follow streaks: Variability and stocks. In R. Alterman & D. Kirsh (Eds.), *Proceedings of the Twenty-fifth Annual Meeting of the Cognitive Science Society* (pp. 192-197). Hillsdale, NJ: Lawrence Erlbaum.
- Burns, B. D. & Wieth, M. (2003). Causality and Reasoning: The Monty Hall Dilemma. In R. Alterman & D. Kirsh (Eds.), *Proceedings of the Twenty-fifth Annual Meeting of the Cognitive Science Society* (pp. 198-203). Hillsdale, NJ: Lawrence Erlbaum.
- Burns, B. D. (2001). The hot hand in basketball: Fallacy or adaptive thinking? . In J. D. Moore & K. Stenning (Eds.), *Proceedings of the Twenty-third Annual Meeting of the Cognitive Science Society* (pp. 152-157). Hillsdale, NJ: Lawrence Erlbaum.
- Burns, B. D., & Vollmeyer, R. (2000). Problem solving: Phenomena in search of a thesis. In L. Gleitman & A. K. Joshi (Ed.), *Proceedings of the Twenty-second Annual Meeting of the Cognitive Science Society* (pp. 627-632). Hillsdale, NJ: Lawrence Erlbaum.
- Wieth, M., & Burns, B. D. (2000). Motivation in insight verse incremental problem solving. In L. Gleitman & A. K. Joshi (Ed.), *Proceedings of the Twenty-second Annual Meeting of the Cognitive Science Society* (pp. 559-564). Hillsdale, NJ: Lawrence Erlbaum.
- Vollmeyer, R., Burns, B. D., & Rheinberg, F. (2000). Goal specificity and learning with a multimedia program. In L. Gleitman & A. K. Joshi (Ed.), *Proceedings of the Twenty-second Annual Meeting of the Cognitive Science Society* (pp. 541-546). Hillsdale, NJ: Erlbaum.

- Burns, B. D., & Vollmeyer, R. (1998). Modeling the opponent facilitates adversarial problem solving. In M. Gernsbacher (Ed.), *Proceedings of the Twentieth Annual Meeting of the Cognitive Science Society* (pp. 191-196). Hillsdale, NJ: Lawrence Erlbaum.
- Vollmeyer, R., Rheinberg, F., & Burns, B. D. (1998). Goals, strategies, and Motivation. In M. Gernsbacher (Ed.), *Proceedings of the Twentieth Annual Meeting of the Cognitive Science Society* (pp. 1090-1095). Hillsdale, NJ: Lawrence Erlbaum.
- Burns, B. D. (1996). Building a theory of problem solving and scientific discovery: How big is the N in N-space search? In G. W. Cottrel (Eds.), *Proceedings of the Eighteenth Annual Meeting of the Cognitive Science Society* (pp. 19-20). Hillsdale, NJ: Lawrence Erlbaum.
- Burns, B. D. & Vollmeyer, R. (1996). Goals and problem solving: Learning as search of three spaces. In G. W. Cottrel (Eds.), *Proceedings of the Eighteenth Annual Meeting of the Cognitive Science Society* (pp. 23-24). Hillsdale, NJ: Lawrence Erlbaum.
- Vollmeyer, R., & Burns, B. D. (1995). Does hypothesis-instruction improve learning? In J. D. Moore & J. F. Lehman (Eds.), *Proceedings of the Seventeenth Annual Meeting of the Cognitive Science Society* (pp. 771-776). Hillsdale, NJ: Lawrence Erlbaum.
- Burns, B. D., & Holyoak, K. J. (1994). Competing models of analogy: ACME versus Copycat. In A. Ram, & K. Eiselt (Eds.), *Proceedings of the Sixteenth Annual Meeting of the Cognitive Science Society* (pp. 100-105). Hillsdale, NJ: Lawrence Erlbaum.
- Vollmeyer, R., Holyoak, K. J., & Burns, B. D. (1994). Goal specificity in hypothesis testing and problem solving. In A. Ram, & K. Eiselt (Eds.), *Proceedings of the Sixteenth Annual Meeting of the Cognitive Science Society* (pp. 916-921). Hillsdale, NJ: Lawrence Erlbaum.
- Burns, B. D., Hummel, J. E., & Holyoak, K. J. (1993). Establishing analogical mappings by synchronizing oscillators. *Proceedings of the Fourth Australian Conference on Neural Networks* (pp. 49-52). Melbourne, Australia: ACNN.
- Burns, B. D., & Schreiner, M. E. (1992) Representation and transfer: Extending the Copycat model. *Proceedings of the Fourteenth Annual Meeting of the Cognitive Science Society* pp. 737-742). Hillsdale, NJ: Lawrence Erlbaum.
- Burns, B. D. (1990). Goals in analogical problem solving. *Proceedings of the Twelfth Annual Meeting of the Cognitive Science Society* (pp. 45-52). Hillsdale, NJ: Lawrence Erlbaum.

Other Conference Presentations

- Burns, B. D. (2003). *The hot hand in basketball: Fallacious belief, adaptive behavior*. Presented at the Forty-fourth Annual Meeting of the Psychonomic Society, Vancouver, CA.
- Burns, B. D. (2003). *Variability and following streaks*. Presented at the Society for Judgement and Decision Making Annual Meeting, Vancouver, CA.
- Burns, B. D. (2003). *Webpages without a server as general experimental software*. Presented at the Thirty-third Annual Meeting of the Society for Computers in Psychology, Vancouver, CA.
- Burns, B. D. (2003). *Assessing decision making: Normative beliefs verse Adaptive Behavior*. Joint International Conference on Cognitive Science. Sydney, Australia
- Burns, B. D. (2002). *Does the law of small numbers explain the gambler's fallacy?* Presented at the Forty-Third Annual Meeting of the Psychonomic Society, Kansas City, MO.
- Burns, B. D. (2002). Belief in the Hot Hand Improves Performance: A Mathematical Model. In W. D. Gray & C. D. Schunn (Eds.), *Proceedings of the Twenty-fourth Annual Meeting of the Cognitive Science Society* (p. 991). Hillsdale, NJ: Lawrence Erlbaum.

- Vollmeyer, R., Rheinberg, F., & Burns, B. D. (2002). Motivational patterns during hypermedia learning. In W. D. Gray & C. D. Schunn (Eds.), *Proceedings of the Twenty-fourth Annual Meeting of the Cognitive Science Society* (p. 1048). Hillsdale, NJ: Lawrence Erlbaum.
- Burns, B. D., & Corpus, B. (2001). *Causality and predictions about runs: "Gambler's fallacy" versus "Hot hand."* Presented at the Forty-Second Annual Meeting of the Psychonomic Society, Orlando, FL.
- Burns, B. D., & Wieth, M. (2000). *The Monty Hall Dilemma: A causal explanation of a cognitive illusion.* Presented at the Forty-First Annual Meeting of the Psychonomic Society, New Orleans, LA.
- Vollmeyer, R. & Burns, B. D. (March, 2000). Zielspezifität beim Lernen mit einem multimedialen Lernprogramm [Goal specificity in learning with a multimedia program]. In D. Vorberg, A. Fuchs, T. Futterer, A. Heinecke, U. Heinrich, U. Mattler & S. Töllner (Eds.), *Experimentelle Psychologie* [Experimental Psychology] (p. 79). Lengerich: Pabst.
- Vollmeyer, R., Burns, B. D. & Rheinberg, F. (February, 2000). How motivation develops when learning with a multimedia program. Paper presented at the 7th Workshop on Achievement and Task Motivation in Leuven, Belgium.
- Burns, B. D. (August, 1999). *Speed effects of skilled chess performance.* Poster presented at of the Twentieth Annual Meeting of the Cognitive Science Society, Vancouver, Canada.
- Vollmeyer, R., Burns, B. & Rheinberg, F. (1999b). *Wie beeinflussen spezifische Ziele das Lernen?* [What influences goal specificity in learning?] Vortrag auf der 14. Tagung Entwicklungspsychologie in Fribourg, Schweiz.
- Vollmeyer, R., Burns, B. & Rheinberg, F. (1999a). Zielspezifität, Strategien und Motivation. [Goal specificity, strategies, and motivation] In E. Schröger, A. Mecklinger & A. Widmann (Eds.), *Experimentelle Psychologie. Beiträge zur 41. Tagung experimentell arbeitender Psychologen* (p. 201-202). Lengerich: Pabst.
- Burns, B. D. (November, 1998). *Capturing heffalumps: The effect of speed on chess skill.* Presented at the Thirty-Ninth Annual Meeting of the Psychonomic Society, Dallas, TX.
- Burns, B. D., & Vollmeyer, R. (1997). A three-space theory problem solving. In M. G. Shafto & P. Langley (Eds.), *Proceedings of the Nineteenth Annual Meeting of the Cognitive Science Society* (p. 879). Hillsdale, NJ: Lawrence Erlbaum.
- Burns, B. D., & Vollmeyer, R. (November, 1997). *Metacognition in a three-space search theory of problem solving.* Presented at the Thirty-Eighth Annual Meeting of the Psychonomic Society, Philadelphia, PA.
- Burns, B. D., & Vollmeyer, R. (April, 1997). *A three-space search theory of problem solving.* Presented at the 39. Tagung experimentell arbeitender Psychologen, Berlin, Germany.
- Burns, B. D., & Vollmeyer, R. (November, 1996). *Adversarial Problem Solving: Modeling in competitive games.* Presented at the Thirty-Seventh Annual Meeting of the Psychonomic Society, Chicago, Illinois.
- Burns, B. D. (August, 1996). *Asymmetrical analogical transfer.* Presented at the Third International Conference on Thinking, London, UK.
- Burns, B. D. (November, 1995). *Asymmetrical transfer effects due to augmenting source or target analogies.* Presented at the Thirty-Sixth Annual Meeting of the Psychonomic Society, Los Angeles, California.
- Vollmeyer, R. & Burns, B. D. (November, 1995). *Goal specificity and hypothesis testing in learning a complex system.* Presented at the Thirty-Sixth Annual Meeting of the Psychonomic Society, Los Angeles, California.

- Vollmeyer, R., Burns, B. D. & Holyoak, K. J. (April, 1995). Die Wirkung von Zielspezifität und Hypothesentesten auf das Lernen einer Problemlöseaufgabe [The influence of goal specificity and hypothesis testing on the learning of a problem task]. Presented at the 37. Tagung experimentell arbeitender Psychologen. Ruhr - Universität Bochum, Germany.
- Burns, B. D. (November, 1994). *Coherence of representations predict asymmetries of transfer*. Presented at the Thirty-Fifth Annual Meeting of the Psychonomic Society, St Louis, MO.
- Vollmeyer, R., Burns, B. D., & Holyoak, K. J. (November, 1994). *Hypothesis testing in learning to solve a complex problem*. Presented at the Thirty-Fifth Annual Meeting of the Psychonomic Society, St Louis, MO.
- Burns, B. D. (June, 1993). *Modeling the opponent in adversarial problem solving*. Presented at the Fifth Annual Convention of the American Psychological Society, Chicago, Illinois.
- Burns, B. D. (February, 1993). *Priming as evidence for mapping in analogical reasoning*. Presented at the Second Australian Cognitive Science Conference, Melbourne, Australia.
- Burns, B. D. (July, 1992). *Analogical reasoning, mapping, and priming*. Presented at the Second International Conference on Thinking, Plymouth, UK.

Grants

A model of learning in complex systems (B. D. Burns). Humboldt Fellowship for postdoctoral research at University of Potsdam, Germany, 1996-1998

Goal-specificity and Learning (R. Vollmeyer & B. D. Burns). From the German-American Academic Council to for 30,000 DM (money goes to University of Potsdam), for 1999-2001.

Grants under submission

Decision making based on streaks: Testing cognitive models (with Erik Altmann). Submitted to NSF 1/30/2004.

Context, biases, appearances and gaze control in assessment of fleeting social partners (with Tom Getty, John Henderson, & Fred Dyer). Submitted to NSF Human Social Dynamics program, 3/31/2004

Professional Experience

Ad hoc reviewer

Cognitive Psychology, Cognition, American Journal of Psychology, Australian Journal of Psychology, Journal of Experimental Psychology: Human, Perception and Performance, Memory and Cognition, Journal of Experimental Psychology: Applied, Psychonomic Bulletin & Review, Journal of Memory and Language, NSF grant proposal, Cognitive Science Society annual conference, International Conference for Computational Modeling.

Professional Memberships

American Psychological Society
Cognitive Science Society
Psychonomic Society
Society for Judgement and Decision Making