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## Keith James Holyoak

### Personal Information

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Citizenship: United States & Canada

### Education

University of British Columbia, B.A. (1971) in psychology  
Stanford University, Ph.D. (1976) in psychology

### Academic Appointments

Distinguished Professor of Psychology, University of California, Los Angeles, 2004-present  
Visiting Scholar, Dept. of Cognitive Science, Johns Hopkins University, 2019  
Visiting Professor of Psychology (honorary), National University of Singapore, 2014  
Professor of Psychology, University of California, Los Angeles, 1986-2004  
Vice-Chair for Academic Personnel, Dept. of Psychology, UCLA, 2002-2006  
Co-Director, Cognitive Science Research Program, 1989-92  
Member, Brain Research Institute, 1991-present  
Professor of Psychology, University of Michigan, 1986  
Associate Professor of Psychology, University of Michigan, 1981-1986  
Visiting Scholar, LRDC, University of Pittsburgh, 1985-1986  
Visiting Associate Professor of Psychology, Carnegie Mellon University, 1984-1985  
Assistant Professor of Psychology, University of Michigan, 1976-1981

### Research Interests

Analogy, induction, and problem solving  
Computational models of cognition  
Cognitive neuroscience  
Educational applications of technology

### Awards

Warren Medal, Society of Experimental Psychologists, 2022  
Selected for "Gallery of Scientists" on website of the Federation of Associations in Behavioral & Brain Sciences, 2019  
UCLA Dept. of Psychology Distinguished Service Award, 2005  
James McKeen Cattell Fellow, 1999  
John Simon Guggenheim Fellow, 1991  
NIMH Research Scientist Development Award, 1981-1986  
Rackham Faculty Fellowship, University of Michigan, 1976  
Stanford University Fellowship, 1972-1975

British Columbia Psychological Association Gold Medal, 1971

### **Honorary Fellowships and Offices in Scientific Organizations**

Member, American Academy of Arts and Sciences (from 2019)

Fellow, American Association for the Advancement of Science (from 2003)

Fellow, Cognitive Science Society (from 2006); Chair of Governing Board (1994-1995);

Member of Governing Board (1992-1998)

Fellow, Association for Psychological Science (from 1993)

Fellow, Society of Experimental Psychologists (from 1990)

Nominating committee member, AAAS Section J (2007-2009, 2012-2014)

### **Professional Service**

#### *Editorships:*

Editor, Psychological Review, 2016-2021

Editor, Cognitive Psychology, 1995-1999

Senior Editor, Cognitive Science, 1990-1992

Associate Editor, Cognitive Psychology, 2000-2016

Associate Editor, Psychological Science, 2012-2015

Guest Co-editor, Special section on analogy and metaphor, J. of Experimental Psychology: Learning, Memory, and Cognition, 2012

#### *Member of Editorial Board:*

Journal of Experimental Psychology: General, 1988-1995; 2007-2011

Thinking & Reasoning, 1993-present

Adaptive Behavior, 1991-2016

Cognitive Psychology, 1990-1995; 2000-2016

American Journal of Psychology, 1988-2008

Psychological Science, 2001

Cognitive Science, 1992-2000

Journal of Experimental Psychology: Learning, Memory, and Cognition, 1984-1987

Memory & Cognition, 1977-1990

#### *Ad Hoc Reviewer:*

##### *Journals*

American Psychologist, Applied Cognitive Psychology, Behavioral and Brain Sciences, Brain and Cognition, Brain Research, Cerebral Cortex, Child Development, Cognition, Cognition and Instruction, Cognitive Development, Cognitive Neuroscience, Cognitive Psychology, Cognitive Science, Cognitive Systems Research, Developmental Psychology, European Journal of Cognitive Psychology, Journal of Cognitive Neuroscience, Journal of Cognitive Psychology, Journal of Experimental Child Psychology, Journal of Experimental Psychology: Human Perception and Performance, Journal of Experimental Psychology: Learning, Memory, and Cognition, Journal of Experimental Social Psychology, Journal of General Psychology, Journal of Medical Informatics, Journal of Memory and Language, Journal of Neuroscience, Journal of Personality and Social Psychology, Nature Neuroscience, Neuropsychologia, Perception & Psychophysics, Perspectives on Psychological Science, PLoS Computational Biology, Political Psychology, Proceedings of the National Academy of Sciences (USA), Psychological Bulletin, Psychological Review, Psychological Science,

Psychological Science in the Public Interest, Psychology and Aging,  
Psychonomic Bulletin and Review, Review of General Psychology, Science,  
Scientific Study of Literature, Trends in Cognitive Sciences

*Government & Private Agencies, Conferences, and Publishing Companies*

Guggenheim Foundation, National Science Foundation, National Institute of  
Education, National Science and Engineering Council (Canada), Social Science &  
Humanities Research Council (Canada), Biotechnology & Biological Sciences  
Research Council (UK), Australian Research Council, Conferences of Cognitive  
Science Society, Program Committee, Advanced Computing in the Social  
Sciences (Energy Division of Oakridge National Laboratory), Adjudicator:  
Ontario Premier's Discovery Awards Program, MIT Press, Harcourt Brace  
Jovanovich, Lawrence Erlbaum Associates, Prentice-Hall, Harvard University  
Press, Princeton University Press, Oxford University Press, Wiley & Sons

*Advisory Panel Memberships and Workshops:*

Member of Advisory Board, Society for the Neuroscience of Creativity (2017-)  
External review panel, UCSD Psychology Dept., 2020  
External advisory board, Grawemeyer Prize in Psychology, 2012  
External review panel, U. of British Columbia Psychology Dept., 2009  
Co-organizer, 2<sup>nd</sup> International Conference on Analogy, Sofia, Bulgaria, 2009  
NSF workshop on Higher Cognition in Adolescents, 2008  
NIH panel, 2005  
Chair of judging panel, APA Early Career Award in cognition/learning, 2004  
NSF workshop on Knowledge Transfer, 2002  
NSF Learning & Intelligent Systems initiative, 1997  
Co-organizer, 1st International Conference on Analogy, Sofia, Bulgaria, 1998  
NIMH Subcommittee on Thinking and Communication, 1993  
International Advisory Board, Dept. of Cognitive Science, New Bulgarian  
University  
Editorial Advisory Board, Issues in Thinking and Reasoning, Erlbaum (UK)  
Editorial Advisory Board, Advances in the Psychology of Thinking, Simon &  
Schuster  
NSF Memory and Cognitive Processes Panel, 1980-1981  
NSF/NIE Program in Science and Mathematics Education, 1978

**Teaching Experience**

University of California, Los Angeles 1986-present

*Undergraduate*

Psychology 10, Introduction to Psychology  
Psychology 120A, Cognitive Psychology  
Psychology 121, Laboratory in Cognitive Psychology  
Psychology 124F (Psychology Honors Program), Thinking  
Psychology 185, Cognitive Science

*Graduate*

Psychology 264, Thinking  
Psychology 269, Analogy in the Mind and Brain

Psychology 269, Applications of Technology for Mathematics Teaching and Learning  
 Psychology 269, Causal Knowledge and Cognitive Evolution  
 Psychology 269, Induction and Knowledge Acquisition  
 Psychology 269, Metaphor and Cognition  
 Psychology 269, The Adaptive Character of Memory and Thinking  
 Neuroscience 211A, Mental Imagery  
 Anthropology 297, Cognitive Science & Anthropology of the Supernatural

University of Michigan, 1976-1986

*Undergraduate*

Psychology 310, Experimental Psychology Lab  
 Psychology 443, Psychology of Thinking  
 Psychology 447, Psychology of Language  
 Psychology 448, Learning and Memory  
 Psychology 518, Learning and Memory Lab

*Graduate*

Psychology 646, Pro-Seminar in Cognitive Psychology  
 Psychology 745, Psychology of Language  
 Psychology 746, Human Learning and Memory  
 Psychology 908, Seminar on Categorization  
 Psychology 948, Seminar on Language Induction

Stanford University, 1972-1976

Teaching Assistant for introductory psychology and psycholinguistics courses

**Former PhD and Post-doctoral Students**

*Associate and Full Professors*

Bruce Burns (Psychology, U. of Sydney, Australia), Richard Catrambone (Psychology, Georgia Tech), Soohyun Cho (Psychology, Chung-Ang University, South Korea), Meredith Gattis (Psychology, Cardiff U., UK), Mary Gick (Psychology, Carleton U., Canada), Dan Krawczyk (Behavioral & Brain Sciences, U. of Texas at Dallas), Jim Kroger (Psychology, New Mexico State U.), Heeseung Lee (Education, Yonsei University, South Korea), Robert Morrison (Psychology & Neuroscience, Loyola U. Chicago), Laura Novick (Psychology & Human Development, Vanderbilt U.), Lindsey Richland (Education, UC Irvine), Carol Seger (Psychology, Colorado State U.), Bobby Spellman (Psychology & Law, U. of Virginia), Regina Vollmeyer (Psychology, U. of Potsdam, Germany), Michael Waldmann (Psychology, U. of Goettingen, Germany), James Waltz (Psychiatry, U. of Maryland)

*Assistant Professors*

Maureen Gray (Elgin Community College), Patrick Plummer (Howard University), Derek Powell (Arizona State University), Tage Rai (UCSD)

*Research Scientists*

Dawn Chen (Google), Michael Vendetti (Oracle), Emily Wong (Cedars-Sinai Hospital), Hunter Priniski (UCLA)

**Publications****Books (Cognitive Science)**

- Holyoak, K. J. (2025). *The human edge: Analogy and the roots of creative intelligence*. Cambridge, MA: MIT Press.
- Holyoak, K. J. (2019). *The spider's thread: Metaphor in mind, brain, and poetry*. Cambridge, MA: MIT Press.
- Holyoak, K. J., & Morrison, R. G. (Eds.) (2012). *The Oxford handbook of thinking and reasoning*. New York: Oxford University Press.
- Kokinov, B., Holyoak, K. J., & Gentner, D. (2009). *New frontiers in analogy research: Proceedings of the Second International Conference on Analogy*. Sofia, Bulgaria: New Bulgarian University Press.
- Holyoak, K. J., & Morrison, R. G. (Eds.) (2005). *The Cambridge handbook of thinking and reasoning*. Cambridge, UK: Cambridge University Press.
- Gentner, D., Holyoak, K. J., & Kokinov, B. N. (Eds.) (2001). *The analogical mind: Perspectives from cognitive science*. Cambridge, MA: MIT Press.
- Holyoak, K. J., Gentner, D., & Kokinov, B. N. (Eds.) (1998). *Advances in analogy research: Integration of theory and data from the cognitive, computational, and neural sciences*. Sofia, Bulgaria: New Bulgarian University Press.
- Shanks, D. R., Holyoak, K. J., & Medin, D. L. (Eds.) (1996). *The psychology of learning and motivation, Vol. 34: Causal learning*. San Diego: Academic Press.
- Grafman, J., Holyoak, K. J., & Boller, F. (Eds.) (1995). *Structure and functions of the human prefrontal cortex*. New York: New York Academy of Sciences.
- Holyoak, K. J., & Thagard, P. (1995). *Mental leaps: Analogy in creative thought*. Cambridge, MA: MIT Press. Paperback edition, 1996. Japanese translation, 1998.
- Holyoak, K. J., & Barnden, J. A. (Eds.) (1994). *Advances in connectionist and neural computation theory, Vol. 2: Analogical connections*. Norwood, N.J.: Ablex.
- Barnden, J. A., & Holyoak, K. J. (Eds.) (1994). *Advances in connectionist and neural computation theory, Vol. 3: Analogy, reminding, and metaphor*. Norwood, N.J.: Ablex.
- Holland, J. H., Holyoak, K. J., Nisbett, R. E., & Thagard, P. (1986). *Induction: Processes of inference, learning, and discovery*. Cambridge, MA: MIT Press. Paperback edition, 1989. Japanese translation, 1991. Portions of Ch. 4 reprinted in L. Davis (Ed.) (1987), *Genetic algorithms and simulated annealing* (pp. 116-128). London: Pitman. Portions of Ch. 9 reprinted in A. I. Goldman (Ed.) (1993), *Readings in philosophy and cognitive science* (pp. 23-41). Cambridge, MA: MIT Press. Chapter 1 reprinted in N. Lazaric & E. Lorenz (Eds.) (2003), *Critical studies in economic institutions: Knowledge, learning and routines* (pp. 25-56). Camberley, UK: Edward Elgar.
- Glass, A. L., & Holyoak, K. J. (1986). *Cognition*, 2nd edition. New York: Random House.
- Glass, A. L., Holyoak, K. J., & Santa, J. L. (1979). *Cognition*. Reading, MA: Addison-Wesley.

**Books (Poetry)**

- Holyoak, K. (2019). *Oracle Bones: Poems from the Time of Misrule*. Seattle, WA: Goldfish Press.
- Holyoak, K. (2015). *The Gospel According to Judas*. Loveland, OH: Dos Madres Press.

- Holyoak, K. (2012). *Foreigner: New English Poems in Chinese Old Style*. Loveland, OH: Dos Madres Press.
- Holyoak, K. (2010). *My Minotaur: Selected Poems 1998-2006*. Loveland, OH: Dos Madres Press.
- Holyoak, K. (translator) (2007). *Facing the Moon: Poems of Li Bai and Du Fu*. Durham, NH: Oyster River Press.

### **Individual Papers**

- Ichien, N., & Holyoak, K. J. (2026). Beyond analogy: Pragmatic constraints on metaphor comprehension and production. *Journal of Experimental Psychology: General*. DOI:10.1037/xge0001919.
- Holyoak, K. J. (2026). Human versus artificial creativity: A case study in poetry. *Journal of Creativity*, 36(1), 10018. DOI:10.1016/j.yjoc.2025.100118.
- Lee, A. J., Holyoak, K. J., & Lu, H. (2025). Enhancing visuospatial mapping in relational category learning. *Journal of Experimental Psychology: Learning, Memory, and Cognition*. DOI:10.1037/xlm0001514.
- Webb, T., Holyoak, K. J., & Lu, H. (2025). Evidence from counterfactual tasks supports emergent analogical reasoning in large language models. *PNAS Nexus*, 4(5). DOI:10.1093/pnasnexus/pgaf135.
- Kamper, D. G., Lin, A., & Holyoak, K. J. (2025). Is AI-assisted creativity an “original sin”? Lay judgments of qualities justifying copyright protection for artworks derived from AI- vs. human-generated sources. In A. Ruggeri, D. Barner, C. Walker, & N. Bramley (Eds.), *Proceedings of the 47<sup>th</sup> Annual Conference of the Cognitive Science Society*. Cognitive Science Society.
- Lee, A. J., Webb, T., Bihl, T., Holyoak, K. J., & Lu, H. (2025). Few-shot learning of visual compositional concepts through probabilistic schema induction. In A. Ruggeri, D. Barner, C. Walker, & N. Bramley (Eds.), *Proceedings of the 47<sup>th</sup> Annual Conference of the Cognitive Science Society*. Cognitive Science Society.
- Holyoak, K. J. (2024). Why I am not a Turing machine. *Journal of Cognitive Psychology*, 1-12. <https://doi.org/10.1080/20445911.2024.2395573>.
- Ichien, N., Stamenković, D., & Holyoak, K. J. (2024). Large language model displays emergent ability to interpret novel literary metaphors. *Metaphor and Symbol*, 39(4), 296-309. DOI: 10.1080/10926488.2024.2380348.
- Ichien, N., Stamenković, D., Whatley, M. C., Castel, A. D., & Holyoak, K. J. (2024). Advancing with age: Older adults excel in comprehension of novel metaphors. *Psychology and Aging*. <https://doi.org/10.1037/pag0000836>
- Ichien, N., Stamenković, D., & Holyoak, K. J. (2024). Interpretation of novel literary metaphors by humans and GPT-4. In L. K. Samuelson, S. Frank, M. Toneva, A. Mackey, & E. Hazeltine (Eds.), *Proceedings of the 46<sup>th</sup> Annual Conference of the Cognitive Science Society*. Cognitive Science Society.
- Ichien, N., Lin, N., Holyoak, K. J., & Lu, H. (2024). Cognitive complexity explains processing asymmetry in judgments of similarity versus difference. *Cognitive Psychology*, 151, 101661. DOI:10.1016/j.cogpsych.2024.101661
- Lee, D. G., & Holyoak, K. J. (2024). Transient value refinements during deliberation facilitate choice. *Decision*, 11(2), 303–319. DOI:10.1037/dec0000215
- Ichien, N., Liu, Q., Fu, S., Holyoak, K. J., Yuille, A. L., & Lu, H. (2023). Two computational approaches to visual analogy: Task-specific models versus domain-general mapping. *Cognitive Science*, 47: e13347. DOI: org/10.1111/cogs.13347

- Holyoak, K. J., Ichien, N., & Lu, H. (2023). Analogy and the generation of ideas. *Creativity Research Journal*, 36(3), 532-543. DOI: 10.1080/10400419.2023.2232673
- Webb, T., Fu, S., Bihl, T., Holyoak, K. J., & Lu, H. (2023). Zero-shot visual reasoning through probabilistic analogical mapping. *Nature Communications*, 15, 5144. DOI: 10.1038/s41467-023-40804-x
- Webb, T., Holyoak, K. J., & Lu, H. (2023). Emergent analogical reasoning in large language models. *Nature Human Behaviour*, 7(9), 1526-1541. DOI: 10.1038/s41562-023-01659-w
- Ichien, N., Lin, N., Holyoak, K. J., & Lu, H. (2023). Asymmetry in similarity and difference judgments results from asymmetry in the complexity of the relations *same* and *different*. In M. Goldwater, F. Anggoro, B. Hayes, & D. Ong (Eds.), *Proceedings of the 45<sup>th</sup> Annual Meeting of the Cognitive Science Society* (pp. 2149-2156). Cognitive Science Society.
- Lee, A. J., Lu, H., & Holyoak, K. J. (2023). Human relational concept learning on the Synthetic Visual Reasoning Task. In M. Goldwater, F. Anggoro, B. Hayes, & D. Ong (Eds.), *Proceedings of the 45<sup>th</sup> Annual Meeting of the Cognitive Science Society* (pp. 799-805). Cognitive Science Society.
- Chesebrough, C., Chrysiou, E. G., Holyoak, K. J., Zhang, F., & Kounios, J. (2023). Conceptual change induced by analogical reasoning sparks aha moments. *Creativity Research Journal*, 35(3), 499–521. DOI: 10.1080/10400419.2023.2188361
- Holyoak, K. J. (2023). Poet and psychologist: A conversation. *Metaphor and Symbol*, 38(2), 117-129. DOI: 10.1080/10926488.2022.203447
- Stamenković, D., Milenković, K., Ichien, N., & Holyoak, K. J. (2023). An individual-differences approach to poetic metaphor: Impact of aptness and familiarity. *Metaphor and Symbol*, 38(2), 149-161.
- Ichien, N., Alfred, K. L., Baia, S., Kraemer, D. J. M., Holyoak, K. J., Bunge, S. A., & Lu, H. (2023). Relational and lexical similarity in analogical reasoning and recognition memory: Behavioral evidence and computational evaluation. *Cognitive Psychology*, 141, 101550.
- Holyoak, K. J., Ichien, N., & Lu, H. (2022). From semantic vectors to analogical mapping. *Current Directions in Psychological Science*, 31(4), 355–361.
- Lu, H., Ichien, N., & Holyoak, K. J. (2022). Probabilistic analogical mapping with semantic relation networks. *Psychological Review*, 129(5), 1078–1103.
- Fu, S., Holyoak, K. J., & Lu, H. (2022). From vision to reasoning: Probabilistic analogical mapping between 3D objects. In J. Culbertson, A. Perfors, H. Rabagliati, & V. Ramenzoni (Eds.), *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*. Cognitive Science Society.
- Ichien, N., Alfred, K. L., Baia, S., Kraemer, D. J. M., Bunge, S. A., Lu, H., & Holyoak, K. J. (2022). Relation representations in analogical reasoning and recognition memory. In J. Culbertson, A. Perfors, H. Rabagliati, & V. Ramenzoni (Eds.), *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*. Cognitive Science Society.
- Ichien, N., Kan, A., Holyoak, K. J., & Lu, H. (2022). Generative inferences in relational and analogical reasoning: A comparison of computational models. In J. Culbertson, A. Perfors, H. Rabagliati, & V. Ramenzoni (Eds.), *Proceedings of the 44th Annual Meeting of the Cognitive Science Society* (pp. 468-474). Cognitive Science Society.
- Ionescu, A., Lu, H., Holyoak, K. J., & Sandhofer, C. M. (2022). Children’s acquisition of the concept of antonym across different lexical classes. In J. Culbertson, A. Perfors, H. Rabagliati, & V. Ramenzoni (Eds.), *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*. Cognitive Science Society.
- Lee, J., & Holyoak, K. J. (2022). Familial guilt: A cross-society comparison of judgments of collective family responsibility. In J. Culbertson, A. Perfors, H. Rabagliati, & V. Ramenzoni

- (Eds.), *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*. Cognitive Science Society.
- Linford, B., Ichien, N., Holyoak, K. J., & Lu, H. (2022). Impact of semantic representations on analogical mapping with transitive relations. In J. Culbertson, A. Perfors, H. Rabagliati, & V. Ramenzoni (Eds.), *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*. Cognitive Science Society.
- Sneffjella, B., Ichien, N., Holyoak, K. J., & Lu, H. (2022). Predicting human judgments of relational similarity: comparison of computational models based on vector representations of meaning. In J. Culbertson, A. Perfors, H. Rabagliati, & V. Ramenzoni (Eds.), *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*. Cognitive Science Society.
- Wong, E.F., Priniski, J. H., & Holyoak, K. J. (2022). Cognitive and emotional impact of politically-polarized internet memes about climate change. In J. Culbertson, A. Perfors, H. Rabagliati, & V. Ramenzoni (Eds.), *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*. Cognitive Science Society.
- Ichien, N., Lu, H., & Holyoak, K. J. (2022). Predicting patterns of similarity among abstract semantic relations. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 48(1), 108-121.
- Priniski, J. H., & Holyoak, K. J. (2022). A darkening spring: How preexisting distrust shaped COVID-19 skepticism. *PLoS ONE* 17(1): e0263191.  
<https://doi.org/10.1371/journal.pone.0263191>
- Morsanyi, K., Hamilton, J., Stamenković, D., & Holyoak, K. J. (2022). Linking metaphor comprehension with analogical reasoning: Evidence from typical development and Autism Spectrum Disorder. *British Journal of Psychology*, 113, 479-495. DOI: 10.1111/bjop.12542
- Lee, D. G., & Holyoak, K. J. (2021). Coherence shifts in attribute evaluations. *Decision*, 8(4), 257–276.
- Gray, M. E., & Holyoak, K. J. (2021). Teaching by analogy: From theory to practice. *Mind, Brain, and Education*, 15, 250-263.
- Wong, E. F., & Holyoak, K. J. (2021). Cognitive and motivational factors driving sharing of internet memes. *Memory & Cognition*, 49, 863-872.
- Lee, J., Priniski, J. H., Valderrama, S., & Holyoak, K. J. (2021). Disgraced professionals: Revelation of immorality decreases evaluations of professional competence and accomplishment. In T. Fitch, C. Lamm, H. Leder, & K. Teßmar-Raible (Eds.), *Proceedings of the 43rd Annual Meeting of the Cognitive Science Society*. Cognitive Science Society.
- Priniski, J. H., McClay, M., & Holyoak, K. J. (2021). Rise of QAnon: A mental model of good and evil stews in an echochamber. In T. Fitch, C. Lamm, H. Leder, & K. Teßmar-Raible (Eds.), *Proceedings of the 43rd Annual Meeting of the Cognitive Science Society*. Cognitive Science Society.
- Ichien, N., Liu, Q., Fu, S., Holyoak, K. J., Yuille, A. L., & Lu, H. (2021). Visual analogy: Deep learning versus compositional models. In T. Fitch, C. Lamm, H. Leder, & K. Teßmar-Raible (Eds.), *Proceedings of the 43rd Annual Meeting of the Cognitive Science Society*. Cognitive Science Society.
- Holyoak, K. J., & Lu, H. (2021). Emergence of relational reasoning. *Current Opinion in Behavioral Sciences*, 37, 118-124.
- Chiang, J. N., Peng, Y., Lu, H., Holyoak, K. J., & Monti, M. M. (2021). Distributed code for semantic relations predicts neural similarity during analogical reasoning. *Journal of Cognitive Neuroscience*, 33, 377-389.
- Holyoak, K. J., & Monti, M. M. (2021). Relational integration in the human brain: A review and synthesis. *Journal of Cognitive Neuroscience*, 33, 341-356.

- Morsanyi, K., Stamenković, D., & Holyoak, K. J. (2020). Metaphor processing in autism: A systematic review and meta-analysis. *Developmental Review*, *57*, article 100925.
- Stamenković, D., Ichien, N., & Holyoak, K. J. (2020). Individual differences in comprehension of contextualized metaphors. *Metaphor and Symbol*, *35*(4), 285-301.
- Simon, D., & Holyoak, K. J. (2020). Ex ante coherence shifts. *Behavioral and Brain Sciences*, *43*, e47.
- Ichien, N., Lu, H., & Holyoak, K. J. (2020). Verbal analogy problem sets: An inventory of testing materials. *Behavior Research Methods*, *52*, 1803-1816.  
<https://doi.org/10.3758/s13428-019-01312-3>
- Morsanyi, K., Stamenković, D., & Holyoak, K. J. (2020). Analogical reasoning in autism: A systematic review and meta-analysis. In K. Morsanyi & R. M. J. Byrne (Eds.), *Thinking, reasoning, and decision making in autism* (pp. 59-87). Milton Park, UK: Routledge.
- Lee, J., & Holyoak, K. J. (2020). “But he’s my brother”: The impact of family obligation on moral judgments and decisions. *Memory & Cognition*, *48*(1), 158–170.
- Gray, M. E., & Holyoak, K. J. (2020). Individual differences in relational reasoning. *Memory & Cognition*, *48*(1), 96–110.
- Priniski, J. H., & Holyoak, K. J. (2020). Crowdsourcing to analyze belief systems underlying social issues. In S. Denison, M. Mack, Y. Xu, & B. Armstrong (Eds.), *Proceedings of the 42nd Annual Meeting of the Cognitive Science Society* (pp. 443-449). Cognitive Science Society.
- Holyoak, K. J., & Powell, D. (2019). Moral judgment as reasoning by constraint satisfaction. *Behavioral and Brain Sciences*, *42*, e156.
- Lu, H., Liu, Q., Ichien, N., Yuille, A. L., & Holyoak, K. J. (2019). Seeing the meaning: Vision meets semantics in solving visual analogy problems. In A. Goel, C. Seifert, & C. Freksa (Eds.), *Proceedings of the 41st Annual Meeting of the Cognitive Science Society* (pp. 2201-2207). Austin, TX: Cognitive Science Society.
- Wong, E. F., Schauer, G. F., Gordon, P. C., & Holyoak, K. J. (2019). Semantic and visual interference in solving pictorial analogies. In A. Goel, C. Seifert, & C. Freksa (Eds.), *Proceedings of the 41st Annual Meeting of the Cognitive Science Society* (pp. 3115-3120). Cognitive Science Society.
- Ichien, N., Lu, H., & Holyoak, K. J. (2019). Individual differences in judging similarity between semantic relations. In A. Goel, C. Seifert, & C. Freksa (Eds.), *Proceedings of the 41st Annual Meeting of the Cognitive Science Society* (pp. 464-470). Cognitive Science Society.
- Lu, H., Wu, Y. N., & Holyoak, K. J. (2019). Emergence of analogy from relation learning. *Proceedings of the National Academy of Sciences, USA*, *116*, 4176-4181.
- Stamenković, D., Ichien, N., & Holyoak, K. J. (2019). Metaphor comprehension: An individual-differences approach. *Journal of Memory and Language*, *105*, 108-118.
- Lee, J., & Holyoak, K. J. (2018). “But he’s my brother”: How family obligation impacts moral judgments. In C. Kalish, M. Rau, J. Zhu & T. T. Rogers (Eds.), *Proceedings of the 40th Annual Conference of the Cognitive Science Society* (pp. 677-682). Austin, TX: Cognitive Science Society.
- Gray, M. E., & Holyoak, K. J. (2018). Individual differences in relational reasoning. In C. Kalish, M. Rau, J. Zhu & T. T. Rogers (Eds.), *Proceedings of the 40th Annual Conference of the Cognitive Science Society* (pp. 1741-1746). Cognitive Science Society.
- Peng, Y., Javangula, P. R., Lu, H., & Holyoak, K. J. (2018). Behavioral oscillations in verification of relational role bindings. In C. Kalish, M. Rau, J. Zhu & T. T. Rogers (Eds.), *Proceedings of the 40th Annual Conference of the Cognitive Science Society* (2223-2228). Cognitive Science Society.

- Stamenković, D., & Holyoak, K. J. (2018). Individual differences in both fluid and crystallized intelligence predict metaphor comprehension. In C. Kalish, M. Rau, J. Zhu & T. T. Rogers (Eds.), *Proceedings of the 40th Annual Conference of the Cognitive Science Society* (pp. 2542-2547). Austin, TX: Cognitive Science Society.
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**Published Abstracts (Neuroscience Only)**

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### **Department and University Service**

University of California, Los Angeles:

Vice Chair for Academic Personnel  
 Chair, Cognitive Science Development Committee  
 Chair, Cognitive Area  
 Chair, Cognitive Search Committee (multiple times)  
 Chair, Assistant Professor Guidance Committee  
 Psychology Dept. Executive Committee  
 Merit Review Committee  
 Departmental Long-Range Planning Committee  
 Graduate Admissions Committee

University of Michigan:

Graduate Studies Committee  
 Experimental Area Graduate Admissions Committee  
 Search Committees in Developmental and Experimental Psychology  
 Human Subjects Review Committees (for both College and Psychology Department)  
 Experimental Area Graduate Student Progress Committee  
 Experimental/ Mathematical Areas Training Grant Committee  
 Departmental Executive Committee  
 College Internal Grant Review Board  
 Undergraduate Academic Counselor  
 Coordinator of Psychology 170 (Introductory Experimental)

### **Grants**

National Science Foundation (with H. Lu, S. Bunge, & D. Kraemer)

Title: Collaborative Research: How Does the Brain Represent Abstract Concepts?

Dates: September 1, 2020 to August 31, 2023

Amount: \$136,959 (\$87,794 direct)

National Science Foundation (with H. Lu & A. Yuille)

Title: Collaborative Research: CompCog: Achieving Analogical Reasoning via Human and Machine Learning

Dates: August 15, 2018 to July 31, 2022

Amount: \$477,000 (\$318,113 direct)

Google Faculty Research Award

Title: Human Relational Reasoning and Creativity: Experimental and Computational Studies

Dates: April 1, 2018 (no end date)

Amount: \$64,500

UCLA Academic Senate

Title: Neuroimaging of Analogical Reasoning

Dates: July 1, 2015 to June 30, 2016

Amount: \$9000

Office of Naval Research

Title: Analogical Reasoning: Integration of Neural, Behavioral and Computational Analyses

Dates: March 1, 2008 to February 28, 2014

Amount: \$927,215

Institute of Education Sciences (Co-PI; Eva Baker, PI)

Title: Center for Advanced Technology in Schools

Dates: September 14, 2010 to September 14, 2013

Amount: \$592,000

Canon, Inc.

Title: Analogical Reasoning and Creative Product Design

Dates: February 1, 2010 (no end date)

Amount: \$87,500 (gift to Holyoak lab)

Intelligence Advanced Research Project Activities (UCLA PI; with Lockheed Martin)

Title: FRAMES: Framework for Analogy and Memory Embodied as Spiking Neurons

Dates: December 12, 2010 to December 5, 2012

Amount: \$705,140

Air Force Office of Scientific Research (Co-I; Alan Yuille, PI)

Title: Hidden Causal Structure for Reasoning and Learning: Human Cognition, Machine Intelligence, and Statistics

Dates: October 1, 2008 to September 30, 2011

Amount: \$900,000

Office of Naval Research (in collaboration with Medantic Technology)

Title: Distributed Training for Force Mobilization: CBRNE

Dates: December 1, 2006 to August 31, 2007

Amount: \$24,998

National Institute of Mental Health

Title: Neuroimaging of Analogical Reasoning

Dates: July 1, 2005 to June 30, 2008

Amount: \$129,976 (\$100,000 direct)

National Science Foundation (with D. Simon & S. Read)

Title: Coherence-Based Decision Making: A Theoretical Framework and Practical Applications

Dates: April 15, 2004 to March 31, 2007

Amount: \$143,250 (\$98,436 direct)

Institute of Education Sciences

Title: A Multidisciplinary Study of Analogical Transfer in Children's Mathematics

Dates: January 1, 2004 to December 31, 2006

Amount: \$300,715 (\$202,195 direct)

Office of Naval Research (in collaboration with Medantic Technology)

Title: An Intelligent System for Case-Based Instruction

Dates: July 1, 2004 to January 31, 2005

Amount: \$29,926 (\$19,496 direct)

National Science Foundation (with D. Simon & S. Read)

Title: Collaborative Research: Applying Constraint Satisfaction Models to Legal Reasoning

Dates: August 1, 2000 to June 30, 2004

Amount: \$178,330

Office of Naval Research (in collaboration with Medantic Technology)

Title: Authoring Shell for Case-based Reasoning

Dates: January 25, 2002 to July 24, 2002

Amount: \$16,191

National Science Foundation (with J. Hummel)

Title: Learning and Inference with Schemas and Analogies

Dates: February 1, 1998 to January 31, 2001

Amount: \$250,000

National Science Foundation (with J. Hummel)

Title: Schema Induction in a Structure-Sensitive Connectionist Model

Dates: August 15, 1995 to July 31, 1998

Amount: \$150,000

National Institute of Neurological Disorders and Stroke (with J. Grafman & F. Boller)

Title: Structure and Functions of the Human Prefrontal Cortex

Dates: September 30, 1994 to September 29, 1995

Amount: \$17,000

National Science Foundation

Title: Mechanisms of Analogical Reminding and Priming

Dates: August 15, 1993 to August 14, 1995

Amount: \$150,000

Army Research Institute (with P. Thagard)

Title: A Cognitive Architecture for Analogy and Problem Solving

Dates: September 1, 1989 to August 31, 1992

Amount: \$599,793

National Science Foundation (Co-PI; 4 others)

Title: Maintenance and Support for Parallel Computation in Cognitive Science  
and Cognate Areas

Dates: August 1, 1991 to July 31, 1994

Amount: \$600,000

**Biomedical Research Support Grant**

Title: Conditioning and Learning Within Rule-based Default Hierarchies

Dates: June 14, 1989 to June 30, 1990

Amount: \$15,420

**National Science Foundation (Co-PI; 9 others)**

Title: Center for Research in Computational Neuro-Cognition

Dates: July 1, 1987 to June 30, 1988

Amount: \$994,700 (plus \$300,000 supplement, August 1988)

**Keck Foundation (Co-PI; 7 others)**

Title: Center for Research in Computational Neuro-Cognition

Dates July 1, 1988 to June, 30, 1990

Amount: \$750,000

**Army Research Institute (with P. Thagard)**

Title: A Cognitive Model for Solving Ill-Defined Problems

Dates: September 1, 1986 to August 31, 1989

Amount: \$400,840

**National Science Foundation (with M. Bassok)**

Title: Instruction and Transfer Between Isomorphic Topics in Algebra and Physics

Dates: September 1, 1986 to August 31, 1989

Amount: \$106,108

**National Science Foundation (with R. Nisbett)**

Title: Formal versus Pragmatic Approaches to Deductive Reasoning

Dates: October 1, 1984 to September 30, 1986

Amount: \$45,000

**National Science Foundation**

Title: Cognitive Processing of Analogy

Dates: April 1, 1983 to September 30, 1986

Amount: \$118,445

**Spencer Foundation (with P. Cheng and R. Nisbett)**

Title: Influence of Logic Training and Substantive Knowledge on Deductive Reasoning

Dates: January 1, 1983 to June 1, 1984

Amount: \$5,000

**Systems Development Foundation (with J. Holland, R. Nisbett, and P. Thagard)**

Title: The Process of Induction

Dates: August 1, 1983 to September 30, 1984

Amount: \$15,500

**National Science Foundation (with L. S. Fried)**

Title: Perceptual Learning with Ill-Defined Categories

Dates: June 1, 1979 to January 31, 1984

Amount: \$115,247

National Institute of Mental Health

Title: Cognitive Processing of Magnitude and Order Information

Dates: June 1, 1979 to December 31, 1982

Amount: \$120,745

National Science Foundation

Title: Decision Processes in Judgments of Order and Relative Magnitude

Dates: June 1, 1977 to December 31, 1979

Amount: \$59,900

Rackham Faculty Grant, University of Michigan

Title: Perceptual Learning with Ill-Defined Categories

Dates: January 1, 1978 to December 31, 1978

Amount: \$5,028

Rackham Faculty Grant, University of Michigan

Title: Decision Processes in Judgments of Order and Relative Magnitude

Dates: January 1, 1977 to December 31, 1977

Amount: \$5,004