

Michael C. Frank

77 Massachusetts Avenue
Room 46-3037D
Cambridge, MA 02139

(617) 452-2474
mcfrank@mit.edu
tedlab.mit.edu/~mcfrank

Education

Massachusetts Institute of Technology: Ph.D (Expected Spring 2009), Doctoral Program in Department of Brain and Cognitive Sciences, Advisor: Edward Gibson.

Committee members: Joshua Tenenbaum, Rebecca Saxe.

Stanford University: B.S. (2004), Stanford University, Symbolic Systems, Honors.

Stanford University: B.A. (2004), Stanford University, Comparative Literature.

Fellowships, Honors, and Grants

Fellowships

Linguistic Society of America Bloch Fellowship (voting student member of the executive board) (2007 – 2009)

Jacob Javits Fellowship for Graduate Study (2006 – 2009)

National Science Foundation Graduate Fellowship (2006 – 2008)

IIE Fulbright Fellowship to Germany (2005, declined)

Honors

Angus MacDonald Award for Excellence in Undergraduate Teaching, MIT BCS (2008)

International Conference on Infant Studies Travel Award (2008)

Neural Information Processing Systems Travel Award (2007)

Cognitive Science Society Travel Award (2007)

Vision Sciences/Elsevier Travel Award (2007)

Grants

NSF Linguistics Dissertation Improvement Grant (2007), project title “Empirical studies and probabilistic models of word segmentation and word learning.” (Amount: \$11,792)

Sigma Xi Grant-in-aid-of-research (2006), project title “Mechanisms of word segmentation and word learning in infancy.” (Amount: \$800)

Peer-Reviewed Journal Articles

Frank, M. C., Gibson, E., Fedorenko, E., & Everett, D. L. (under review). Number as a cognitive technology: Evidence from Pirahã language and cognition. *Cognition*.

Frank, M. C., Goodman, N. D., & Tenenbaum, J. (under review). Using speakers' referential intentions to model early cross-situational word learning.

Frank, M. C., Vul, E., & Johnson, S. P. (under review). Development of infants' face preference during the first year.

- Frank, M. C., Slemmer, J. A., Marcus, G., & Johnson, S. P. (under review). Information from multiple modalities helps five-month-olds learn abstract rules.
- Johnson, S. P., Davidow, J., Hall, C., & Frank, M. C., (in press). Development of perceptual completion originates in information acquisition. *Developmental Psychology*.
- Johnson, S. P., Fernandes, K. J., Frank, M. C., Kirkham, N. Z., Marcus, G. F., Rabagliati, H., & Slemmer, J. A. (under review). Development of abstract rule learning in infancy.
- Yoon, J., Winawer, J., Witthoft, N., Frank, M. C., Everett, D. L., & Gibson, E. (under review). Cultural differences in photo-triggered perceptual reorganization
- Oppenheimer, D. & Frank, M. C. (2008). A rose in any other font wouldn't smell as sweet: Effects of perceptual fluency on categorization. *Cognition*, 106, 1178-1194.
- Winawer, J., Witthoft, N., Frank, M. C., Wu, L., Wade, A., & Boroditsky, L. (2007). The Russian blues: Effects of language on color discrimination. *Proceedings of the National Academy of Sciences*, 108, 7780-7785.

Manuscripts

- Fedorenko, E., Frank, M. C., Everett, D. L., & Gibson, E. (in prep). Low short-term memory in an Amazonian tribe.
- Fedorenko, E., Gibson, E., & Frank, M. C. (in prep). The role of semantic predictability in the processing of non-local structural dependencies.
- Fedorenko, E., Gibson, E., & Frank, M. C. (in prep). The interaction of syntactic and lexical information sources in language processing: the case of the noun-verb ambiguity.
- Fletcher-Watson, S., Findlay, J. M., Leekam, S. R., Frank, M. C., & Benson, V. (in prep). Eye-movement data reveals attention to social information for people with autism spectrum disorder, in a preferential looking task.
- Frank, M. C., Fedorenko, E., & Gibson, E. (in prep). Assessing the relationship between Pirahã language, cognition, and culture: What's at stake and how to proceed.
- Frank, M. C., Goldwater, S., Griffiths, T., & Tenenbaum, J. (in prep). Modeling human performance in statistical word segmentation.
- Frank, M. C. & Tenenbaum, J. B. (in prep). A simple Bayesian model of abstract rule learning.
- Johnson, S. P., Shats, P., Vasserman, A., Davidow, J., & Frank, M. C. (in prep). Where do infants look when they look at faces?
- Stapert, E., Frank, M., Gibson, E., & Everett, D. L. (in prep). Distribution and function of the marker -sai in Pirahã.

Chapters

- Fernald, A. & Frank, M. C. (in prep). Finding the words: How young children develop skill in interpreting spoken language. In *The Cambridge Handbook of Psycholinguistics*, Spivey, M., Ed.

- Saxe, R., Fedorenko, E., & Frank, M. C. (in prep). Language and Theory of Mind. Handbook of Psycholinguistic and Cognitive Processes: Perspectives in Communication Disorders. Guendouzi, J., Loncke, F., & Williams, M., Eds.
- Johnson, S. P., Amso, D., Frank, M. C., & Shuwairi, S. (2008). Development of Event Perception in Infancy. In *Understanding Events: How Humans See, Represent, and Act on Events*, Shipley, T. F. & Zacks, J. M., Eds. Oxford, UK: Oxford University Press.

Refereed Conference Proceedings

- Frank, M. C., Fedorenko, E., & Gibson, E. (under review). Language as a cognitive technology: English-speakers match like Pirahã when you don't let them count.
- Frank, M. C., Ichinco, D., & Tenenbaum, J. (under review). Principles of generalization for learning sequential structure in language.
- Frank, M. C., Goodman, N. D., & Tenenbaum, J. (2007). A Bayesian framework for cross-situational word learning. *Advances in Neural Information Processing Systems*, 20. Poster spotlight presentation.
- Frank, M. C., Goldwater, S., Mansinghka, V., Griffiths, T., & Tenenbaum, J. (2007). Modeling human performance in statistical word segmentation. *Proceedings of the 29th Annual Meeting of the Cognitive Science Society*.
- Frank, M. C., Mansinghka, V., Gibson, E., & Tenenbaum, J. (2006). Word segmentation as word learning: Integrating stress and meaning with distributional cues. *Proceedings of the 31st Annual Boston University Conference on Language Development*.
- Johnson, S. P., Davidow, J., Hall, C., & Frank, M.C. (2006). Developmental mechanisms of perceptual completion. *International Conference on Development and Learning*, Bloomington, IN.
- Witthoft, N., Winawer, J., Wu, L., Wade, A., Frank, M. C., & Boroditsky, L. (2003). Effects of language on color discriminability. *Proceedings of the 25th Annual Meeting of the Cognitive Science Society*.
- Boroditsky, L., Ramscar, M., and Frank, M.C. (2001). Roles of Body and Mind in Abstract Thought. *Proceedings of the 23rd Annual Meeting of the Cognitive Science Society*.

Conference Presentations

- Frank, M. C., Vul, E., & Alvarez, G. (2008). What limits performance in multiple object tracking? Poster to be presented at the meeting of the Vision Science Society, Naples, FL.
- Frank, M. C. & Saxe, R. (2008). Mechanisms of social and distributional word learning. Poster to be presented at the meeting of the Cognitive Neuroscience Society, San Francisco, CA.
- Frank, M. C., Vul, E., & Johnson, S. P. (2008). Comparing attention to faces across development using free-viewing eye-tracking. Talk to be presented at the International Conference on Infant Studies, Vancouver, CA.
- Frank, M. C. & Tenenbaum, J. B. (2008). A Rational Model of Sequential Rule Learning. Talk to be presented at the International Conference on Infant Studies,

- Vancouver, CA, in symposium "Mechanisms of sequence learning in infancy: rules, statistics, and their interactions," chair M. C. Frank.
- Tenenbaum, J. B. & Frank, M. C. (2007). A Bayesian approach to word-learning. Joint talk presented at the University of Pennsylvania workshop "Bridging the Developmental Divide: Sentence Processing Meets Word and Grammar Learning."
- Yoon, J., Winawer, J., Witthoft, N., Frank, M. C., Everett, D. L., & Gibson, E. (2007). Striking Deficiency in Top-Down Perceptual Reorganization of Two-Tone Images in an Amazonian Hunter-Gatherer Tribe. Poster presented at Object Perception, Attention and Memory, Long Beach, CA.
- Frank, M. C. (2007). Probabilistic models of word segmentation and word learning. Talk presented at the convention of the American Speech and Hearing Association.
- Frank, M. C., Goodman, N. D., & Tenenbaum, J. B. (2007). Bayesian models of cross-situational word learning. Talk presented at the UCL workshop "Machine Learning and the Cognitive Science of Language Acquisition."
- Frank, M. C., Vul, E., & Johnson, S. P. (2007). Infants' eye-movements during free viewing as a window into the development of attention. Talk presented at the Annual Meeting of the Vision Sciences Society.
- Gibson, E., Fedorenko, E., & Frank, M. C. (2007). The role of discourse-level and semantic predictability in sentence comprehension. Poster to be presented at the CUNY Conference on Human Sentence Processing.
- Frank, M. C., & Johnson, S. P. (2007). Developmental Increases in Synchrony of Visual Attention. Talk presented at the Society for Research in Child Development Meeting, Boston, MA in symposium "New Directions in Developmental Eye-Tracking Research," chairs M.C. Frank and S. P. Johnson.
- Frank, M. C., Mansinghka, V., & Gibson, E. (2006). Integrating linguistic and referential cues into probabilistic models of word learning. Proceedings of the 28th Meeting of the Cognitive Science Society.
- Frank, M. C., Mansinghka, V., & Gibson, E. (2006). Integrating visual information into probabilistic models of word learning. Symposium on Statistical Learning and Brain Plasticity at the Center for Vision Science at the University of Rochester.
- Frank, M. C. (2006). Word segmentation as word learning. CUNY Conference on Human Sentence Processing, New York, NY.
- Johnson, S. P., Shats, P., Vasserman, A., Davidow, J., & Frank, M.C. (2006). Where do infants look when they look at faces? International Conference on Infant Studies, Kyoto.
- Johnson, S. P., Davidow, J., Frank, M.C., & Hall-Haro, C. (2006). Constraints on perceptual completion in infancy. International Conference on Infant Studies, Kyoto.
- Johnson, S. P., Davidow, J., & Frank, M.C. (2006). Developmental origins of perceptual completion in infancy. Proceedings of the Annual Meeting of the Vision Sciences Society.
- Hall-Haro, C., Frank, M. C., & Johnson, S. P. (2005). Infants' motion sensitivity predicts smooth pursuit performance but fails to predict perceptual completion. Proceedings of the Annual Meeting of the Vision Science Society, 2005.

- Frank, M.C. & Ramscar, M. (2003). How do Presentation and Context Influence Representation for Functional Fixedness Tasks? Proceedings of the 25th Annual Meeting of the Cognitive Science Society.
- Frank, M.C., & Boroditsky, L. (2001). Language affects memory, but does it affect perception? Proceedings of the 23rd Annual Meeting of the Cognitive Science Society.

Other Writing

- Frank, M.C. (2004). Relax, Practice Makes Perfect: Patterns in Adult Learning of the German Plural System. Undergraduate Honors Thesis in Symbolic Systems, Stanford University. Advisor: Michael Ramscar. Second Reader: Thomas Wasow.
- Frank, M.C. (2003). Against Informational Atomism. The Dualist, Stanford's Undergraduate Journal of Philosophy.

Memberships and Professional service

Executive board member, Linguistic Society of America
Member, Cognitive Neuroscience Society
Member, Cognitive Science Society
Member, International Society for Infant Studies
Member, Society for Research in Child Development
Member, Vision Science Society
Sponsored member, American Academy for the Advancement of Science
Ad-hoc reviewer for Language and Cognitive Processes, Cognitive Science, Cognitive Science Conference, Linguistic Review

Teaching and Organizational Experience

Teaching assistantships:

- Introduction to Psychology (9.00), Prof. John Gabrieli, Spring 2007
- Developmental Psychology (9.85), Prof. Laura Schulz, Fall 2007 (lectures on number, early speech perception, and language acquisition)
- Lab in Higher Level Cognition (9.51), Prof. Rebecca Saxe, Spring 2008 (lectures on PsychToolbox and graphic display of information).

Guest lectures:

- Neural Basis of Learning and Memory (9.03), Prof. Susan Corkin, Fall 2007
- Psycholinguistics (9.59), Prof. Edward Gibson, Spring 2007 & 2008.
- Stanford course on Matlab for psychology graduate students, lectures on eye-tracking analysis and audio-visual stimulus presentation, Summer 2006
- Language & Mind (9.98), Prof. Edward Gibson, Winter 2006

Department service:

- Student representative, cognitive job search committee (2006 – 2007 search and 2007 – 2008 search)
- Coordinator, MIT CogLunch talk series (2006 - 2007)

- Babies & Statistics (Harvard/MIT reading group on statistical learning), 2005 - 2006
- BAYGL (MIT Bayesian grammar learning group), Fall 2006

SPLASH Educational Studies Program for high school students

- Visual perception through illusions, Fall 2004
- Social psychology, Fall 2006
- Introduction to Neuroanatomy, Fall 2007 and 2008.

Rock climbing instruction

- NYU Athletics Department, 2004 – 2005
- MIT Department of Athletics and Physical Education, 2006 – 2007

Other Skills

Languages

Spanish, fluent with extensive coursework

German, proficient

French, proficient

Portuguese, intermediate

Computer skills

Programming: Matlab, Ruby, C/C++

Statistical analysis: Matlab, SPSS, Excel

Graphic design: Photoshop, Illustrator, PowerPoint