

# Michael C. Frank

---

Stanford University, Department of Psychology  
450 Serra Mall, Room 420-278  
Stanford, CA 94305

Phone: (917) 855-4756  
Email: [mcfrank@stanford.edu](mailto:mcfrank@stanford.edu)  
Homepage: <http://www.stanford.edu/~mcfrank>

## Employment

Stanford University: Assistant Professor (starting fall 2010)

## Education

Massachusetts Institute of Technology: Ph.D, Department of Brain and Cognitive Sciences (expected May 2010)

Advisor: Edward Gibson

Committee members: Joshua Tenenbaum, Rebecca Saxe, Susan Carey (external)

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

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

## Publications

### *Journal Articles*

Fletcher-Watson, S., Leekam, S. R., Benson, V., Frank, M. C., & Findlay, J. M., (2009). Eye-movement data reveals attention to social information in autism spectrum disorder. *Neuropsychologia*, 47, 248–257.

Frank, M. C., Goodman, N. D., & Tenenbaum, J. (2009). Using speakers' referential intentions to model early cross-situational word learning. *Psychological Science*, 20, 578–585.

Frank, M. C., Slemmer, J. A., Marcus, G., & Johnson, S. P. (2009). Information from multiple modalities helps five-month-olds learn abstract rules. *Developmental Science*, 12, 504–509.

Frank, M. C., Vul, E., & Johnson, S. P. (2009). Development of infants' attention to faces during the first year. *Cognition*, 110, 160–170.

Johnson, S. P., Fernandes, K. J., Frank, M. C., Kirkham, N. Z., Marcus, G. F., Rabagliati, H., & Slemmer, J. A. (2009). Development of abstract rule learning in infancy. *Infancy*, 14, 2–18.

Johnson, S. P., Davidow, J., Hall, C., & Frank, M. C., (2008). Development of perceptual completion originates in information acquisition. *Developmental Psychology*, 44, 1214–1224.

Frank, M. C., Everett, D. L., Fedorenko, E., & Gibson, E., (2008). Number as a cognitive technology: Evidence from Pirahã language and cognition. *Cognition*, 108, 819–824.

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.

### Refereed Conference Proceedings

- Jones, B., Johnson, M., and Frank, M. C. (2010). Learning Words and Their Meanings from Unsegmented Child-directed Speech. *Proceedings of the North American Conference on Computational Linguistics*.
- Vul, E., Frank, M. C., Alvarez, G. A., & Tenenbaum, J. B. (2009). Explaining human multiple object tracking as resource-constrained approximate inference in a dynamic probabilistic model. *Advances in Neural Information Processing Systems*, 22.
- Frank, M. C., Goodman, N. D., Tenenbaum, J. B., & Fernald, A. (2009). Continuity of discourse provides information for word learning. *Proceedings of the 31st Annual Meeting of the Cognitive Science Society*.
- Frank, M. C., Goodman, N. D., Lai, P., & Tenenbaum, J. B. (2009). Informative communication in word production and word learning. *Proceedings of the 31st Annual Meeting of the Cognitive Science Society*.
- Ichinco, D., Frank, M. C., & Saxe, R. (2009). Cross-situational word learning respects mutual exclusivity. *Proceedings of the 31st Annual Meeting of the Cognitive Science Society*.
- Roy, B. C., Frank, M. C., Roy, D. (2009). Exploring word learning in a high-density longitudinal corpus. *Proceedings of the 31st Annual Meeting of the Cognitive Science Society*.
- Frank, M. C., Fedorenko, E., & Gibson, E. (2008). Language as a cognitive technology: English-speakers match like Pirahã when you don't let them count. *Proceedings of the 30th Annual Meeting of the Cognitive Science Society*. [Winner of the Marr Prize for Best Student Paper]
- Frank, M. C., Ichinco, D., & Tenenbaum, J. B. (2008). Principles of generalization for learning sequential structure in language. *Proceedings of the 30th Annual Meeting of the Cognitive Science Society*.
- Frank, M. C., Goodman, N. D., & Tenenbaum, J. B. (2007). A Bayesian framework for cross-situational word learning. *Advances in Neural Information Processing Systems*, 20.
- Frank, M. C., Goldwater, S., Mansinghka, V., Griffiths, T., & Tenenbaum, J. B. (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. B. (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. *Proceedings of the 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*.

### Chapters

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

## Fellowships, Honors, and Grants

### *Fellowships*

National Science Foundation Graduate Fellowship  
Jacob Javits Fellowship for Graduate Study  
Linguistic Society of America Bloch Fellowship (2007–2009)  
Voting student member of the executive board

### *Honors*

Cognitive Science Society Travel Award (2007, 2008, 2009)  
Walle Nauta Award for Continued Dedication to Teaching, MIT BCS (2009)  
Society for Research in Child Development Travel Award (2009)  
David Marr Prize for Best Student Paper, Cognitive Science Society (2008)  
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)  
Vision Sciences/Elsevier Travel Award (2007)

### *Grants*

NSF Linguistics Dissertation Improvement Grant #0746251, \$11,792 (2007–2009)  
“Empirical studies and probabilistic models of word segmentation and word learning”  
Sigma Xi Grant-in-aid-of-research, \$800 (2006)  
“Mechanisms of word segmentation and word learning in infancy”

## Presentations

### *Invited Presentations*

Frank, M. C., Vul, E., Saxe, R., & Johnson, S. P. (2010). “Free-viewing eye-tracking as a tool for understanding infants’ social attention.” Talk presented at the International Conference on Infant Studies, Baltimore, MD.  
“Early word learning through communicative inference” (2010). Macquarie University Institute for Cognitive Science.  
“Numerical cognition in the absence (or temporary unavailability) of language for number” (2009). CUNY Sentence Processing Supper.  
“Early word learning through communicative inference” (2009). Yale Developmental Lunch.  
“Early word learning through communicative inference” (2009). School of Informatics, Departmental Colloquium, University of Edinburgh.

“Early word learning through communicative inference” (2009). IRTG Annual Meeting, Munich, Germany.

“Word learning as communicative inference” (2009). Conference on Natural Language Learning (CoNLL), Boulder, Colorado.

“Numerical cognition in the absence (or temporary unavailability) of language for number” (2009). University of Chicago, Workshop on Language, Cognition, and Computation.

“Early word learning through communicative inference” (2009). Brown University special seminar.

“Numerical cognition in the absence (or temporary unavailability) of language for number” (2009). University of California, San Diego, Department of Cognitive Science, special seminar.

“Early word learning through intentional inference” (2009). University of California, San Diego, Department of Psychology, special seminar.

“Early word learning through intentional inference” (2009). MIT, special seminar.

“Development of social looking in infancy” (2009). Tobii Technologies User Conference, New York, NY.

“Early word learning through intentional inference” (2009). Princeton University, Department of Psychology, special seminar.

“Numerical cognition in the absence (or temporary unavailability) of language for number” (2009). Stanford University, Department of Psychology, Friday Seminar.

“Early word learning through intentional inference” (2009). Stanford University, Department of Psychology, Departmental Colloquium.

“Early word learning through intentional inference” (2009). University of Wisconsin, Madison, special seminar.

“Numerical cognition in the absence (or temporary unavailability) of language for number” (2008). The 49th Annual Meeting of the Psychonomic Society, Chicago, IL, as part of symposium “Language as a tool for cognition,” organizers, Lera Boroditsky and Dedre Gentner.

“Learning words is easier if you know what the speaker is talking about” (2008). The 5th Annual Workshop on Word Production, Annapolis, MD.

“A Bayesian approach to word-learning” (2008). Joint talk (with J. B. Tenenbaum) at the University of Pennsylvania workshop “Bridging the Developmental Divide: Sentence Processing Meets Word and Grammar Learning.”

### *Other Conference Presentations*

Frank, M. C., Goodman, N. D., & Tenenbaum, J. B. (2010). “Constraining cross-situational learning using social and discourse information.” Talk presented at the International Conference on Infant Studies, Baltimore, MD.

Frank, M. C., Goodman, N. D., & Tenenbaum, J. B. (2010). “Modeling infant rule learning as sequence generalization under resource limitations.” Talk presented at the International Conference on Infant Studies, Baltimore, MD.

Hannon, E., Matta, A. S., & Frank, M. C. (2010). "Development of language- and music-specific biases in a rule learning task." Talk presented at the International Conference on Infant Studies, Baltimore, MD.

"Numerical cognition in the absence (or temporary unavailability) of language for number" (2010). Second Workshop on the Languages of Papua, Manokwari, Indonesia.

Frank, M. C., Goodman, N. D., Fernald, A., & Tenenbaum, J. B. (2009). "Using discourse and social information to infer speakers' referential intentions." Poster presented at the 34th Boston University Conference on Language Development (Talk Alternate).

Vul, E., Frank, M. C., Alvarez, G., and Tenenbaum, J. B. (2009). "Modeling and quantifying tradeoffs in multiple object tracking." Talk presented at OPAM.

Frank, M. C. (2009). "Word learning as communicative inference." Poster presented at Cambridge Machine Learning Summer School, Cambridge, UK.

Frank, M. C. (2009). "Word learning as communicative inference." Poster presented at the workshop on Probabilistic Models of Cognitive Development, Banff, Alberta.

Frank, M. C. (2009). "Language as a link between exact number and approximate magnitude." Talk presented at the Annual meeting of the Vision Science Society, Naples, FL, in symposium "Is number visual? Is vision numerical?," chair M. C. Frank.

Frank, M. C., Gibson, E., & Tenenbaum, J. B. (2009). "Large-scale statistical segmentation with naturally-distributed word frequencies." Talk presented at the Annual Meeting of the Society for Research in Child Development, Denver, CO in symposium "From Input to Uptake: Word Frequency Effects as a Window into the Mechanisms of Early Language Learning," chair M. C. Frank.

Frank, M. C., Goodman, N. D., & Tenenbaum, J. B. (2009). "Integrating Social and Discourse Information with Cross-Situational Word Learning." Talk presented at the Annual Meeting of the Society for Research in Child Development, Denver, CO.

Yeung, E., Cheung, P., Frank, M. C., & Barner, D. (2009). "Mental Abacus as a Tool to Track Exact Quantities in the Absence of Language." Talk presented at the Western Interdisciplinary Student Symposium on Language Research, London, Ontario.

Ichinco, D., Frank, M. C., & Saxe, R. (2008). "Cross-situational statistics and mutual exclusivity: do they interact in early word learning?" Talk presented at the New England Psychology Conference.

Serna, M., Frank, M. C., Thompson, T., & Saxe (2008). "Language is preferred but not required for theory of mind representation in adults." Talk presented at the New England Psychology Conference.

Frank, M. C., Goodman, N. D., & Tenenbaum, J. B. (2008). "Modeling early word learning through inference about speakers' referential intentions." Talk presented at the 33rd Boston University Conference on Language Development.

Frank, M. C., Vul, E., & Alvarez, G. (2008). "What limits performance in multiple object tracking?" Poster 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 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 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 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.

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, Boston, MA.

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 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." Poster presented at 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?" Poster presented at the 25th Annual Meeting of the Cognitive Science Society.

Frank, M.C., & Boroditsky, L. (2001). "Language affects memory, but does it affect perception?" Poster presented at the 23rd Annual Meeting of the Cognitive Science Society.

## Media Coverage

“Number as a cognitive technology: Evidence from Pirahã language and cognition”

Reported on [sciencenews.org](http://sciencenews.org), Language Log, [slashdot.org](http://slashdot.org), London Telegraph, Discover Magazine (100 Top Science Stories of 2008).

“Development of infants’ attention to faces in the first year”

Reported in Babytalk magazine, April 2009.

## Memberships and Professional Service

### *Memberships*

Association for Psychological Science, Cognitive Science Society, International Society for Infant Studies, Society for Research in Child Development, and Vision Science Society

### *Professional Service*

Executive board member, Linguistic Society of America (2007–2009)

Chair, LSA Committee for Student Affairs and Concerns (2007–2009)

Member, LSA Strategic Planning Workgroup

Organizational board member and reviewer, Child Language Research Forum (Stanford University, Summer 2009)

Ad-hoc reviewer for Child Development, Cognition, Cognitive Science, Developmental Psychology, Developmental Science, Journal of Memory and Language, Language and Cognitive Processes, Linguistic Review, Perception, Public Library of Science, Proceedings of the National Academy of Sciences, Psychological Review, Psychological Science, and others.

Conference reviewing for Neural Information Processing Systems; International Conference on Infant Studies.

Program committee: Cognitive Science Society Annual Meeting (2010)

Last updated: March 14, 2010

<http://www.stanford.edu/~mcfrank/papers/cv.pdf>