Michael Frank
David and Lucile Packard Foundation Professor in Human Biology and Associate Professor, by courtesy, of Linguistics
Psychology

Bio

BIO
How do we learn to communicate using language? I study children's language learning and how it interacts with their developing understanding of the social world. I use behavioral experiments, computational tools, and novel measurement methods like large-scale web-based studies, eye-tracking, and head-mounted cameras.

ACADEMIC APPOINTMENTS
• Associate Professor, Psychology
• Associate Professor (By courtesy), Linguistics
• Member, Bio-X
• Member, Maternal & Child Health Research Institute (MCHRI)
• Member, Wu Tsai Neurosciences Institute

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS
• Advisory Board, MacArthur-Bates Communicative Development Inventory (2014 - present)
• Governing board member, Cognitive Science Society (2015 - present)

PROGRAM AFFILIATIONS
• Symbolic Systems Program

LINKS
• Michael Frank - Department of Psychology: http://web.stanford.edu/~mcfrank/
• Language and Cognition Lab site: http://langcog.stanford.edu

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS
How do we learn to communicate using language? I study children's language learning and how it interacts with their developing understanding of the social world. I use behavioral experiments, computational tools, and novel measurement methods like large-scale web-based studies, eye-tracking, and head-mounted cameras.

Teaching

COURSES
2020-21
• Behavior, Health, and Development: HUMBIO 4B (Spr)
• Experimental Methods: PSYCH 251, SYMSYS 195E (Aut)

2019-20
• Behavior, Health, and Development: HUMBIO 4B (Spr)
• Experimental Methods: PSYCH 251 (Aut)
• Psychometrics and automated experiment design: PSYCH 241 (Aut)

2018-19
• Behavior, Health, and Development: HUMBIO 3B (Win)
• Experimental Methods: PSYCH 251 (Aut)

2017-18
• Lab in Experimental Methods: PSYCH 251 (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)
Mika Asaba, Erin Bennett, Cai Guo, Michael Hahn, Ben Stenhaug, Arianna Yuan

Postdoctoral Faculty Sponsor
Alexandra Carstensen, Bria Long, Pooja Paul, Angeline Sin Mei Tsui

Doctoral Dissertation Advisor (AC)
Rondeline Williams

Postdoctoral Research Mentor
Alexandra Carstensen, Angeline Sin Mei Tsui

Doctoral (Program)
Ben Peloquin

Publications

PUBLICATIONS

• Consistency and Variability in Children's Word Learning Across Languages. *Open mind: discoveries in cognitive science*  
  Braginsky, M., Yurovsky, D., Marchman, V. A., Frank, M. C.  
  2019; 3: 52–67

• Data availability, reusability, and analytic reproducibility: evaluating the impact of a mandatory open data policy at the journal Cognition *ROYAL SOCIETY OPEN SCIENCE*  
  2018; 5 (8)

• A Collaborative Approach to Infant Research: Promoting Reproducibility, Best Practices, and Theory-Building  
  WILEY.2017; 421–35

• Wordbank: an open repository for developmental vocabulary data *JOURNAL OF CHILD LANGUAGE*  
  Frank, M. C., Braginsky, M., Yurovsky, D., Marchman, V. A.  
  2017; 44 (3): 677-694

Pragmatic Language Interpretation as Probabilistic Inference. *Trends in cognitive sciences*
Goodman, N. D., Frank, M. C.
2016; 20 (11): 818-829

Inferring word meanings by assuming that speakers are informative. *Cognitive psychology*
Frank, M. C., Goodman, N. D.
2014; 75: 80-96

Predicting Pragmatic Reasoning in Language Games *SCIENCE*
Frank, M. C., Goodman, N. D.
2012; 336 (6084): 998-998

Modeling human performance in statistical word segmentation *COGNITION*
Frank, M. C., Goldwater, S., Griffiths, T. L., Tenenbaum, J. B.
2010; 117 (2): 107-125

Online Developmental Science to Foster Innovation, Access, and Impact. *Trends in cognitive sciences*
Sheskin, M., Scott, K., Mills, C. M., Bergelson, E., Bonawitz, E., Spelke, E. S., Fei-Fei, L., Keil, F. C., Gweon, H., Tenenbaum, J. B., Jara-Ettinger, J., Adolph, K. E., Rhodes, et al
2020

The Growth of Children’s Semantic and Phonological Networks: Insight From 10 Languages. *Cognitive science*
Fourtassi, A., Bian, Y., Frank, M. C.
2020; 44 (7): e12847

Children Flexibly Seek Visual Information to Support Signed and Spoken Language Comprehension *JOURNAL OF EXPERIMENTAL PSYCHOLOGY-GENERAL*
MacDonald, K., Marchman, V. A., Fernald, A., Frank, M. C.
2020; 149 (6): 1078–96

Addressing Publication Bias in Meta-Analysis Empirical Findings From Community-Augmented Meta-Analyses of Infant Language Development *ZEITSCHRIFT FUR PSYCHOLOGIE-JOURNAL OF PSYCHOLOGY*
Tsui, S., Cristia, A., Frank, M. C., Bergmann, C.
2020; 228 (1): 50–61

Advancing Transparency and Openness in Child Development Research: Opportunities *CHILD DEVELOPMENT PERSPECTIVES*
2020; 14 (1): 3–8

What counts as an exemplar model, anyway? A commentary on Ambridge (2020) *FIRST LANGUAGE*
Mahowald, K., Kachergis, G., Frank, M. C.
2020

The Interactions of Rational, Pragmatic Agents Lead to Efficient Language Structure and Use. *Topics in cognitive science*
Peloquin, B. N., Goodman, N. D., Frank, M. C.
2020; 12 (1): 433–45

Children’s Social Information Seeking is Sensitive to Referential Ambiguity. *Child development*
Hembacher, E., deMayo, B., Frank, M. C.
2020

How optimal is word recognition under multimodal uncertainty? *Cognition*
Fourtassi, A., Frank, M. C.
2020; 199: 104092

The role of developmental change and linguistic experience in the mutual exclusivity effect. *Cognition*
Lewis, M., Cristiano, V., Lake, B. M., Kwan, T., Frank, M. C.
• Characterizing the Dynamics of Learning in Repeated Reference Games. *Cognitive science*
  Hawkins, R. D., Frank, M. C., Goodman, N. D.
  2020; 44 (6): e12845

• Continuous developmental change explains discontinuities in word learning. *Developmental science*
  Fourtassi, A., Regan, S., Frank, M. C.
  2020: e13018

• N-Best Evaluation for Academic Hiring and Promotion. *Trends in cognitive sciences*
  Frank, M. C.
  2019

• Towards a more robust and replicable science of infant development. *Infant behavior & development*
  Frank, M. C.
  2019; 57: 101349

• childes-db: A flexible and reproducible interface to the child language data exchange system *BEHAVIOR RESEARCH METHODS*
  Sanchez, A., Meylan, S. C., Braginsky, M., MacDonald, K. E., Yurovsky, D., Frank, M. C.
  2019; 51 (4): 1928–41

• childes-db: A flexible and reproducible interface to the child language data exchange system. *Behavior research methods*
  Sanchez, A., Meylan, S. C., Braginsky, M., MacDonald, K. E., Yurovsky, D., Frank, M. C.
  2019

• The role of salience in young children’s processing of ad hoc implicatures. *Journal of experimental child psychology*
  Yoon, E. J., Frank, M. C.
  2019; 186: 99–116

• Promoting Replicability in Developmental Research Through Meta-analyses: Insights From Language Acquisition Research *CHILD DEVELOPMENT*
  Bergmann, C., Tsuji, S., Piccinini, P. E., Lewis, M. L., Braginsky, M., Frank, M. C., Cristia, A.

• Still Suspicious: The Suspicious-Coincidence Effect Revisited. *Psychological science*
  Lewis, M. L., Frank, M. C.
  2018: 956797618794931

• A Practical Guide for Transparency in Psychological Science *COLLABRA-PSYCHOLOGY*
  2018; 4 (1)

• With Great Data Comes Great (Theoretical) Opportunity. *Trends in cognitive sciences*
  Frank, M. C.
  2018

• The Role of Design and Training in Artifact Expertise: The Case of the Abacus and Visual Attention *COGNITIVE SCIENCE*
  Srinivasan, M., Wagner, K., Frank, M. C., Barner, D.
  2018; 42: 757–82

• The Role of Gesture in Supporting Mental Representations: The Case of Mental Abacus Arithmetic *COGNITIVE SCIENCE*
  Brooks, N. B., Barner, D., Frank, M., Goldin-Meadow, S.
  2018; 42 (2): 554–75

• Pre-linguistic segmentation of speech into syllable-like units *COGNITION*
  Rasanen, O., Doyle, G., Frank, M. C.
  2018; 171: 130–50

• Early Understanding of Pragmatic Principles in Children's Judgments of Negative Sentences *LANGUAGE LEARNING AND DEVELOPMENT*
  Nordmeyera, A. E., Frank, M. C.
• A Bayesian decision-making framework for replication. *Behavioral and Brain Sciences*
  Hardwicke, T. E., Tessler, M., Peloquin, B. N., Frank, M. C.
  2018; 14 (4): 262–78

• Data availability, reusability, and analytic reproducibility: evaluating the impact of a mandatory open data policy at the journal Cognition. *Royal Society open science*
  2018; 5 (8): 180448

• A Bayesian decision-making framework for replication. *The Behavioral and brain sciences*
  Hardwicke, T. E., Tessler, M. H., Peloquin, B. N., Frank, M. C.
  2018; 41: e132

• The Trouble With Quantifiers: Exploring Children's Deficits in Scalar Implicature. *Child development*
  Horowitz, A. C., Schneider, R. M., Frank, M. C.
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• Social cues modulate the representations underlying cross situational learning. *Cognitive Psychology*
  MacDonald, K., Yurovsky, D., Frank, M. C.
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• Semantic Coherence Facilitates Distributional Learning. *Cognitive Science*
  Ouyang, L., Boroditsky, L., Frank, M. C.
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• Beyond naive cue combination: salience and social cues in early word learning. *Developmental Science*
  Yurovsky, D., Frank, M. C.
  2017; 20 (2)

• The development of children's ability to track and predict turn structure in conversation. *Journal of Memory and Language*
  Casillas, M., Frank, M. C.
  2017; 92: 234-253

• Adaptive Engagement of Cognitive Control in Context-Dependent Decision Making. *Cerebral Cortex*
  Waskom, M. L., Frank, M. C., Wagner, A. D.
  2017; 27 (2): 1270-1284

• The Emergence of an Abstract Grammatical Category in Children's Early Speech. *Psychological Science*
  Meylan, S. C., Frank, M. C., Roy, B. C., Levy, R.
  2017; 28 (2): 181-192

• Preschoolers Flexibly Adapt to Linguistic Input in a Noisy Channel. *Psychological Science*
  Yurovsky, D., Case, S., Frank, M. C.
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• MetaLab: A repository for meta-analyses on language development, and more
  Tsuji, S., Bergmann, C., Lewis, M., Braginsky, M., Piccinini, P., Frank, M. C., Cristia, A., Int Speech Commun Assoc
  ISCA-INT SPEECH COMMUNICATION ASSOC:2017: 2038–39

• Beyond naive cue combination: salience and social cues in early word learning. *Developmental science*
  Yurovsky, D., Frank, M. C.
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• Semantic Coherence Facilitates Distributional Learning. *Cognitive science*
  Ouyang, L., Boroditsky, L., Frank, M. C.
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• Avoiding frostbite: It helps to learn from others. *Behavioral and Brain Sciences*
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• Embedded Implicatures as Pragmatic Inferences under Compositional Lexical Uncertainty. *JOURNAL OF SEMANTICS*
  Potts, C., Lassiter, D., Levy, R., Frank, M. C.
  2016; 33 (4): 755-802

• Understanding the effect of social context on learning: A replication of Xu and Tenenbaum (2007b). *Journal of experimental psychology. General*
  Lewis, M. L., Frank, M. C.
  2016; 145 (9): e72-80

• The length of words reflects their conceptual complexity. *COGNITION*
  Lewis, M. L., Frank, M. C.
  2016; 153: 182-195

• Learning Mathematics in a Visuospatial Format: A Randomized, Controlled Trial of Mental Abacus Instruction. *CHILD DEVELOPMENT*
  2016; 87 (4): 1146-1158

• Children's Pragmatic Inferences as a Route for Learning About the World. *CHILD DEVELOPMENT*
  Horowitz, A. C., Frank, M. C.
  2016; 87 (3): 807-819

• Comment on "Math at home adds up to achievement in school". *Science*
  Frank, M. C.
  2016; 351 (6278): 1161-?

• Response to Comment on "Estimating the reproducibility of psychological science". *SCIENCE*
  2016; 351 (6277): 1037

• Chaser: Unlocking the Genius of the Dog Who Knows a Thousand Words (Book Review). *AMERICAN JOURNAL OF PSYCHOLOGY*
  Book Review Authored by: Frank, M. C.
  2016; 129 (1): 99–104

• Adaptive Engagement of Cognitive Control in Context-Dependent Decision Making. *Cerebral cortex*
  Waskom, M. L., Frank, M. C., Wagner, A. D.
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• Using Tablets to Collect Data From Young Children. *JOURNAL OF COGNITION AND DEVELOPMENT*
  Frank, M. C., Sugarman, E., Horowitz, A. C., Lewis, M. L., Yurovsky, D.
  2016; 17 (1): 1-17

• Linguistic structure emerges through the interaction of memory constraints and communicative pressures. *BEHAVIORAL AND BRAIN SCIENCES*
  Lewis, M. L., Frank, M. C.
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• An integrative account of constraints on cross-situational learning. *COGNITION*
  Yurovsky, D., Frank, M. C.
  2015; 145: 53-62

• Predicting the birth of a spoken word. *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Roy, B. C., Frank, M. C., DeCamp, P., Miller, M., Roy, D.
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  Hall, S. S., Frank, M. C., Pusiol, G. T., Farzin, F., Lightbody, A. A., Reiss, A. L.
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• A Second Look at Automatic Theory of Mind: Reconsidering Kovács, Téglás, and Endress (2010). *Psychological science*
  Phillips, J., Ong, D. C., Surtees, A. D., Xin, Y., Williams, S., Saxe, R., Frank, M. C.
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• Relevant and robust: a response to Marcus and Davis (2013). *Psychological science*
  Goodman, N. D., Frank, M. C., Griffiths, T. L., Tenenbaum, J. B., Battaglia, P. W., Hamrick, J. B.
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• Young children's developing sensitivity to discourse continuity as a cue for inferring reference. *Journal of experimental child psychology*
  Horowitz, A. C., Frank, M. C.
  2015; 129: 84-97

• Ad-hoc Implicature in Preschool Children *LANGUAGE LEARNING AND DEVELOPMENT*
  Stillier, A. J., Goodman, N. D., Frank, M. C.
  2015; 11 (2): 176–90

• Unsupervised word discovery from speech using automatic segmentation into syllable-like units
  Rasanen, O., Doyle, G., Frank, M. C., ISCA-INT SPEECH COMMUN ASSOC
  ISCA-INT SPEECH COMMUNICATION ASSOC:2015: 3204–8

• Cultural Differences in Perceptual Reorganization in US and Pirahã Adults *PLOS ONE*
  2014; 9 (11)

• The role of context in young children's comprehension of negation *JOURNAL OF MEMORY AND LANGUAGE*
  Nordmeyer, A. E., Frank, M. C.
  2014; 77: 25-39

• Markers of Topical Discourse in Child-Directed Speech *COGNITIVE SCIENCE*
  Rohde, H., Frank, M. C.
  2014; 38 (8): 1634-1661

• Three ideal observer models for rule learning in simple languages (vol 120, pg 360, 2011) *COGNITION*
  Frank, M. C., Tenenbaum, J. B.
  2014; 132 (3): 501

• Visual search and attention to faces during early infancy. *Journal of experimental child psychology*
  Frank, M. C., Amso, D., Johnson, S. P.
  2014; 118: 13-26

• Cultural differences in perceptual reorganization in US and Pirahã adults. *PloS one*
  2014; 9 (11)

• SPEAKER-INDEPENDENT DETECTION OF CHILD-DIRECTED SPEECH
  Schuster, S., Pancoast, S., Ganjoo, M., Frank, M. C., Jurafsky, D., IEEE

• Throwing out the Bayesian baby with the optimal bathwater: Response to Endress (2013) *COGNITION*
  Frank, M. C.
  2013; 128 (3): 417-423

• Zipfian frequency distributions facilitate word segmentation in context. *Cognition*
  Kurumada, C., Meylan, S. C., Frank, M. C.
  2013; 127 (3): 439-453
• Learning and Long-Term Retention of Large-Scale Artificial Languages  *PLOS ONE*
Frank, M. C., Tenenbaum, J. B., Gibson, E.
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• Throwing out the Bayesian baby with the optimal bathwater: Response to. *Cognition*
Frank, M. C.
2013; 128 (3): 417–23

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• An Open, Large-Scale, Collaborative Effort to Estimate the Reproducibility of Psychological Science  *PERSPECTIVES ON PSYCHOLOGICAL SCIENCE*
2012; 7 (6): 657-660

• Teaching Replication  *PERSPECTIVES ON PSYCHOLOGICAL SCIENCE*
Frank, M. C., Saxe, R.
2012; 7 (6): 600-604

• Learning From Others: The Consequences of Psychological Reasoning for Human Learning  *PERSPECTIVES ON PSYCHOLOGICAL SCIENCE*
Shafto, P., Goodman, N. D., Frank, M. C.
2012; 7 (4): 341-351

• Representing Exact Number Visually Using Mental Abacus  *JOURNAL OF EXPERIMENTAL PSYCHOLOGY-GENERAL*
Frank, M. C., Barner, D.
2012; 141 (1): 134-149

• Verbal interference suppresses exact numerical representation  *COGNITIVE PSYCHOLOGY*
Frank, M. C., Fedorenko, E., Lai, P., Saxe, R., Gibson, E.
2012; 64 (1-2): 74-92

• Measuring the Development of Social Attention Using Free-Viewing  *INFANCY*
Frank, M. C., Vul, E., Saxe, R.
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Frank, M. C., Vul, E., Saxe, R.
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• Learning From Others: The Consequences of Psychological Reasoning for Human Learning.  *Perspectives on psychological science : a journal of the Association for Psychological Science*
Shafto, P., Goodman, N. D., Frank, M. C.
2012; 7 (4): 341–51

• Teaching Replication.  *Perspectives on psychological science : a journal of the Association for Psychological Science*
Frank, M. C., Saxe, R.
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• Three ideal observer models for rule learning in simple languages  *COGNITION*
Frank, M. C., Tenenbaum, J. B.
2011; 120 (3): 360-371

• Overcoming Memory Limitations in Rule Learning  *LANGUAGE LEARNING AND DEVELOPMENT*
Frank, M. C., Gibson, E.
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• Beyond Transitional Probabilities: Human Learners Impose a Parsimony Bias in Statistical Word Segmentation
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