ZHIHAO ZHANG

Curriculum Vitae
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Contact Information

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Academic Positions

Assistant Professor	Darden School of Business, Marketing Area **University of Virginia**	2022-present
Assistant Professor (by courtesy)	Department of Psychology **University of Virginia**	2022-present
Postdoctoral Scholar	Haas School of Business Social Science Matrix **University of California, Berkeley**	2016-2022
	Department of Neurology **University of California, San Francisco**	2016-2017

Education

Ph.D.	**Yale University**	Neuroscience	2016
M.Phil.	**Yale University**	Neuroscience	2013
B.Sc.	**Tsinghua University**	Biological Sciences (with Distinction)	2010

Awards and Fellowships

Best Talk Award   2020
The 18th Annual Meeting of Society for Neuroeconomics

Best Poster Award   2020
The 145th Annual Meeting of the American Neurological Association

Career Transition Award   2019
Scientific Research Network for Decision Neuroscience & Aging

Award for Best Poster Presentation   2017
The 7th Annual Interdisciplinary Symposium on Decision Neuroscience

Trainee Professional Development Award	2015
Society for Neuroscience	
Neuroeconomics Summer School Full Scholarship	2015
New York University Shanghai	
Conference Travel Fellowship	2014, 2015
Yale Graduate Student Assembly	
Kavli Graduate Fellowship in Neuroscience	2012-2013
The Kavli Foundation	
China Scholarship Council-Yale World Scholars Fellowship	2010-2012
The China Scholarship Council	
National Scholarship	2009
The Ministry of Education, P. R. China	
First-Class Scholarship	2005-2007, 2009
Tsinghua University	

Research Interests

General Areas

Consumer Research
Marketing
Neuroeconomics
Cognitive Neuroscience
Natural Language Processing
Law and Neuroscience

Techniques

Computational modeling
Functional neuroimaging
Vector semantics
Neuropharmacology

Publications

#denotes corresponding author(s)   *denotes equal contribution   §denotes mentee
Google Scholar profile: https://scholar.google.com/citations?user=4qKYm5AAAAAJ&hl=en

Articles in revision or under review

Zhang, Z., Kayser A. S., & Hsu, M. Automated inference of consumer brand recall from large-scale text corpora.

§Sundaresan, A., Hsu, M., & **Zhang, Z**. Eliciting complex relational knowledge from masked language models.

Journal Articles

Zhang, Z.[#], [§]Good, M., [§]Kulikov, V., van Horen, F., Bartholomew, M., Kayser A. S.[#], & Hsu, M.[#] (2023) From scanner to court: Toward a neuroscientifically informed "reasonable person" test of trademark infringement. *Science Advances*, 9(6), abo1095.

    - Media coverage: *Fortune, Fast Company, Big Think,* Law360, World *Trademark Review, The Daily Californian*

[§]Maboudian, S., Hsu, M., & **Zhang, Z.**[#] (2022). Visualizing and quantifying longitudinal changes in verbal fluency using recurrence plots. *Frontiers in Aging Neuroscience*, 14.

Zhang, Z.[#], [§]Wang, S., [§]Good, M., [§]Hristova, S., Kayser A. S.[#], & Hsu, M.[#] (2021). Retrieval-constrained valuation: Toward prediction of open-ended decisions. *Proceedings of the National Academy of Sciences*, 118(20).

    - Media coverage: *The Hill,* Medical XPress, *Guokr*

Furman, D. J., **Zhang, Z.**, Chatham, C., [§]Good, M., Badre, D., Hsu, M., & Kayser A. S. (2021). Augmenting frontal dopamine tone enhances maintenance over gating processes in working memory. *Journal of Cognitive Neuroscience*, 33(9), 1753-1765.

Zhang, Z., Chandra, S., Kayser, A. S., Hsu, M., & Warren, J. (2020). A hierarchical Bayesian implementation of the experience-weighted attraction model. *Computational Psychiatry*, 4, 40-60.

Zhang, Z[#]**.,** Coppin, G[#]. (2018). To what extent memory could contribute to impaired food valuation and choices in obesity? *Frontiers in Psychology*, 9, 2523.

Zhang, Z., Fanning, J., [§]Ehrlich, D. B., [§]Chen, W., Lee, D., & Levy, I. (2017). Distributed neural representation of saliency controlled value and category during anticipation of rewards and punishments. *Nature Communications*, 8, 1907.

Zhang, Z., Mendelsohn, A., Manson, K. F., Schiller, D., & Levy, I. (2015). Dissociating value representation and inhibition of inappropriate affective response during reversal learning in the ventromedial prefrontal cortex. *eNeuro*, 2(6), ENEURO-0072.

    - Featured in Viewpoints Q&A at *Nature Neuroscience*

Zhang, Z., Manson, K. F., Schiller, D., & Levy, I. (2014). Impaired associative learning with food rewards in obese women. *Current Biology*, 24(15), 1731-1736.

    - Media coverage: BBC, *Los Angeles Times, The Baltimore Sun, The Orlando Sentinel, Capital Gazette, ScienceDaily, The Times of India, Guokr,* Canadian Broadcasting Corp., China National Radio, *News Ghana*
    - Featured in commentary by neuroscientists Terry Davidson and Ashley Martin and in News & Comment at *Nature Reviews Neuroscience*

Opinion Editorials

Zhang, Z. (February 13, 2023). A less biased way to determine trademark infringement? Asking the brain directly. *The Conversation*.

Hsu, M., **Zhang, Z.**, & Kayser, A. S. (2021). What marketers often miss when measuring the value of being top of mind. *INsights - Consumer Neuroscience in Business*, 34, 14-17.

Invited Commentaries and Book Reviews

Zhang, Z. (2012). Book review for The Age of Insight: The Quest to Understand the Unconscious in Art, Mind, and Brain, From Vienna 1900 to the Present. ***The Yale Journal of Biology and Medicine***, 85(4), 564.

Selected Work in Progress

*denotes equal contribution §denotes mentee

Zhang, Z. Toward financially accountable brand awareness building: Connecting models of brand memory and consumer choice.

Zhang, Z., §Wang, S., Kayser A. S., & Hsu, M. I am not fickle, but my memory might be: Choice switches driven by imperfect memory recall.

Zhang, Z., §Maboudian, S., Jackson A., Ngo, S., Manivannan, M., Kayser, A. S., Hsu, M., & Chiong, W. Mechanistic contributions of memory to decision-making impairments in Alzheimer's disease.

§Chen, P.*, Hsu, M.* & **Zhang, Z.** Mapping 25 years of brand knowledge evolution with vector semantics.

§Wu, Q., **Zhang, Z.**, Kayser A. S., & Hsu, M. Flexible reconfigurations of large-scale brain networks in decisions with predefined vs. self-generated options.

Research Grants

UC Berkeley Fisher Center of Business Analytics Research Grant   2019-2020
Predicting Brand Equity and Top-of-Mind Awareness using Large-Scale Text Corpora
$10,000
This proposal applies insights from cutting-edge big data methods, grounded in validated cognitive processes, to capture consumer awareness across segments and inform managerial actions.
Role: Co-Investigator (with Hsu)

Scientific Research Network for Decision Neurosci. & Aging Pilot Grant   2018–2019
Age-related changes in memory-based choices and its neural basis $47,100
This proposal aims to understand the quantitative relationship between semantic memory, valuation, and choices and to characterize its changes across the lifespan.
Role: Subaward PI (from Samanez-Larkin parent award NIH/NIA R24-AG054355)

UC Berkeley Fisher Center of Business Analytics Research Grant   2018-2019
Big Data Approaches to Understanding Brand Memory $10,000
This proposal aims to leverage recent advances in machine learning, natural language processing, and consumer neuroscience to improve predictive models of memory-based consumer choice.
Role: Co-Investigator (with Hsu)

Invited Talks

2023

    Centre for Res. in the Behav. Sci.   University of Nottingham

2022

    Department of Neurology   University of Virginia
    Department of Psychology   University of Virginia
    School of Management   Fudan University
    School of Psychology and Cog. Sci.   East China Normal Univ.
    Anderson School of Management   UCLA

2021

    School of Management   Univ. Sci. Tech. of China
    Department of Industrial Engineering   University of Chile
    Darden School of Business   University of Virginia
    Department of Marketing, Business   University of Alberta
        Economics, and Law
    The Shansby Marketing Seminar   UC Berkeley
    Behavioral Science Seminar   UC Berkeley

2019 and before
    Neuroeconomics Forum   Yale University
    The Business and Marketing Program   New York Univ. Shanghai
    School of Management   Zhejiang University
    The Shansby Marketing Seminar   UC Berkeley
    Psychology and Economics Lunch   UC Berkeley
    College of Psychology   Shenzhen University
    McGovern Institute for Brain Research   Peking University
    Rotman School of Management   University of Toronto

Select Conference Presentations

Association for Consumer Research (ACR)
- (Oct, 2022) Isolating representations from processes: An application for quantifying product imitation without self-report
- (Oct, 2022) Forecasting consumer brand perception using large-scale text analysis
- (Oct, 2021) Mapping 25 years of consumer knowledge from text corpora
- (Oct, 2019) Predicting consumer brand memory across demographic segments
- (Oct, 2018) Predicting memory-based consumer choice from recall and preferences
- (Oct, 2018) Predicting consumer brand recall and choice using large-scale text corpora

Theory + Practice in Marketing Conference (TPM)
- (Jun, 2021) Mapping 25 years of consumer knowledge from text corpora
- (May, 2019) Large-scale inference of brand memory from text corpora

Society for Consumer Psychology (SCP)
- (Mar, 2020) Predicting consumer brand memory across demographic segments

Future of Brands Conference
  - (Dec, 2019) Predicting consumer brand recall using large-scale text corpora

Behavioral Insights from Text Conference
  - (Jan, 2019) Predicting consumer brand recall and choice using large-scale text corpora

Society for Neuroeconomics & Consumer Neuroscience Satellite Symposium
  - (Oct, 2021) Mechanistic contributions of memory to decision-making impairments in Alzheimer's disease
  - (Oct, 2020) Retrieval-constrained valuation: Toward prediction of open-ended decisions
  - (Oct, 2018) Predicting memory-based decisions

Economic Science Association (ESA)
  - (Oct, 2019) Predicting memory-based choices

Interdisciplinary Symposium on Decision Neuroscience (ISDN)
  - (Jun, 2019) Mnemonic constraints on value-based decision making
  - (Jun, 2017) Distributed neural representation of value, saliency, and category during anticipation of rewards and punishments

Text Analysis Across Domains Conference (TextXD)
  - (Dec, 2022) Did consumers perceive Microsoft as more innovative than Apple in 2005? Recovering how consumers perceived brands in the past using diachronic text analysis
  - (Dec, 2019) Predicting consumer brand recall and choice using large-scale text corpora

Teaching Experience

Instructor

Core Marketing (MBA)   2022
Darden School of Business, University of Virginia

Guest lecturer

Intellectual Property: Current Controversies (J.D.; instructor: Mira T. Sundara Rajan)
School of Law, UC Davis   2020

Marketing Research (MBA; instructor: Ming Hsu)   2019
Haas School of Business, UC Berkeley

Neuromarketing (undergraduate; instructor: Ming Hsu)   2019
Haas School of Business, UC Berkeley

Empirical Research Seminar (J.D.; instructor: Tom R. Tyler)   2016
Yale Law School

Teaching Fellow

Neuroeconomics for Economists (instructor: Ifat Levy)   2016
Department of Economics, Yale University

The Human Brain (instructor: Gregory McCarthy)   2014
Department of Psychology, Yale University

Introduction to the Human Brain: Brain and Thought (instructor: Amy Arnsten)
                                                                         2011, 2012
Department of Psychology & Cognitive Science Program, Yale University

Patent

Hsu, M., Kayser, A., and **Zhang, Z**. System for determining trademark similarity. U.S. patent pending.

Industry Experience

Instructor for corporate training programs   2019
Data Wise Academy

Contributor to the Neuromarketing Yearbook 2018   2018
Neuromarketing Science & Business Association

External consultant on behavioral nudging and analytics   2017
Ecometricx

Project consultant on strategy and marketing   2014
US-Brazil Connect & National Confederation of Industry of Brazil

Select Undergraduate Mentees

Pei-Ming (Vincent) Chen (National Taiwan Univ. '19; visiting student at UCB; currently Ph.D. student in marketing at UCB)
Peter (Shichun) Wang (UC Berkeley '19; currently Ph.D. student in operations research and financial engineering at Princeton)
Samira Maboudian (UC Berkeley '20; honors thesis mentee; currently Ph.D. student in neuroscience at UCB)
Qianying Wu (Univ. of Sci. & Tech of China '20; visiting student at UCB; currently Ph.D. student in behavioral and social neuroscience at Caltech)

Professional Activities

Ad Hoc Reviewer - Journals

Appetite; Cerebral Cortex; Cognitive, Affective, and Behavioral Neuroscience; Communications Biology; eNeuro; Frontiers in Neuroscience; Heliyon; Journal of Alzheimer's Disease; Journal of Behavioral Decision Making; Journal of Business Research; Journal of Interactive Marketing; Journal of Neuroscience; Journal of Neuroscience,

Psychology, and Economics; Journal of the Association for Consumer Research; Molecular Psychiatry; NeuroImage; Neuropsychologia; PLoS Computational Biology; PLoS One; PNAS; Progress in Neurobiology; Psychonomic Bulletin and Review; Psychophysiology; Scientific Reports; Yale Journal of Biology and Medicine

Ad Hoc Reviewer - Conferences

Association for Consumer Research (2022-present); Society for Consumer Psychology (2018-present); American Marketing Association Academic Conference (2022-present); Multidisciplinary Conference on Reinforcement Learning and Decision Making (2019, 2022); European Association for Consumer Research (2023-present)

Conference Planning

The Association of Consumer Research Conference, 2022
Co-Chair, *Special Session "Mapping Consumer Mental Processes and Representations Across Diverse Marketplaces"*

The Society for Neuroeconomics annual meeting, 2021
Chair, *Symposium "The Diverse and Critical Roles of Memory Retrieval Processes in Decision Making"*

Multidisciplinary Conference on Reinforcement Learning and Decision Making, 2019
Member, *Program Committee*

The Association of Consumer Research Conference, 2019
Co-Chair, *Special Session "Extracting Behavioral Insights from Big Data: Novel AI and NLP Approaches"*

Grant Reviewer

Scientific Research Network for Decision Neuroscience & Aging Pilot Grant (2019)

Professional Society Memberships

Association for Consumer Research
Economic Science Association
Society for NeuroEconomics
Society for Neuroscience
Society for Consumer Psychology
Cognitive Neuroscience Society
New York Academy of Science
American Association for the Advancement of Science
National Postdoctoral Association

Services

Darden School of Business, University of Virginia

Member, *Faculty Recruitment Committee (Marketing Area)*   2022

University of California, Berkeley

    Co-President, *Berkeley Postdoctoral Association*   2019-2020

    Member, *Advisory Committee for Postdoc Housing*   2018

Interdepartmental Neuroscience Program, Yale University

    Member & PhD Student Representative, *Executive committee*   2011-2016

    Member, *NeuroDay organizing committee*   2014

    Member, *Graduate curriculum committee*   2012

Yale University

    Alumni Interviewer, *Yale College Admissions Office*   2019-present

    Departmental representative, *Graduate Student Assembly*   2012-2013