Zekun Sun

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Academic Appointment

Postdoctoral Associate — **Yale University**
Advisor: Samuel McDougle — 2023–present

Education

Ph.D. Psychological and Brain Sciences — **Johns Hopkins**
Advisor: Chaz Firestone — 2019–2023

- Thesis: "Cognitive consequences of visual complexity"

M.A. Psychological and Brain Sciences — **Johns Hopkins**
Advisor: Chaz Firestone — 2017–2019

M.S. Cognitive Neuroscience — **Chinese Academy of Sciences**
Advisor: Jin-yan Wang — 2013–2016

- Thesis: "Investigation of pain-related attentional bias and its regulations"

LL.B International Politics — **Nanjing University**
2009–2013

Publications

- **Sun, Z.**, & McDougle, S. D. (under revision). Perceiving Event Structure in Brief Actions.
- **Sun, Z.**, Bai, D., Scholl, B.J., & McDougle, S. D. (2025). Visuomotor adaptation via featureless objects *psyArxiv*
- **Sun, Z.**, Firestone, C., & Hafri, A. (in press). How to build a scene: Relational representations are constructed in a canonical order. *Cognitive Psychology*
- **Sun, Z.**, Han, S., & Firestone, C. (2024). Caricaturing shapes in visual memory.*Psychological Science*, 35, 722–735.
- **Sun, Z.**, & Firestone, C. (2022). Beautiful on the inside: The relationship between skeletal complexity and aesthetics. *Perception*, 51(12), 904-918.
- **Sun, Z.**, & Firestone, C. (2022). Speaking and seeing: How verbal "description length" encodes visual complexity. *Journal of Experimental Psychology: General*, 151, 82–96.
- **Sun, Z.**, & Firestone, C. (2021). Curious objects: How visual complexity guides attention and engagement. *Cognitive Science*, 45(4), e12933.
- **Sun, Z.**, & Firestone, C. (2020). Optimism and pessimism in the predictive brain. *Trends in Cognitive Sciences*, 24, 683-685.
- **Sun, Z.**, & Firestone, C. (2020). The dark room problem. *Trends in Cognitive Sciences*, 24, 346-348.

- Fan, L., Sun, Y. B., **Sun, Z.K.**, Wang, N., Luo, F., Yu, F., & Wang, J. Y. (2018). Modulation of auditory sensory memory by chronic clinical pain and acute experimental pain: a mismatch negativity study. *Scientific Reports*, 8(1), 1-13.
- **Sun, Z.K.**, Wang, J.-Y. & Luo, F. (2016). Experimental Pain Induces Attentional Bias That Is Modified by Enhanced Motivation: An Eye Tracking Study. *European Journal of Pain*, 20(8), 1266-1277.

Manuscripts in preparation

- **Sun, Z.**, & McDougle, S. Novel skill learning recruits motor abstractions.

Conference Presentations

- Sun, Z., & McDougle, S. D. (2025). Dissociating external features from internal structures in visual segmentation of actions. **Talk** presented at the 25nd Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL.
- Sun, Z., & McDougle, S. D. (2025). Novel motor skills recruit visuomotor abstractions. **Poster** presented at the 25nd Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL.
- Sun, Z., Bai, D., Scholl, B. J., & McDougle, S. D. (2025). Motor Adaptation via Pure Visual Change. **Poster** presented at Neural Control of Movement 2025, Panama City, Panama
- Sun, Z., & McDougle, S. D. (2024) Repelling Effects of Distractors Persist in Imitated Movements. Society for Neuroscience 2024, Chicago IL.
- Kang, S., Sun, Z., & McDougle, S. D. (2024) Investigating Structural Learning in a De Novo Motor Skill. Society for Neuroscience 2024, Chicago IL.
- Sun, Z., Bi, w., Yildirim, I., & McDougle, S. D. (May 2024). Breaking down a golf swing: Spatio-temporal dynamics of visual motion underlie high-level structuring of observed actions. **Talk** presented at the 24nd Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL.
- Hafri, A., Sun, Z., & Firestone, C. (May 2024). The psychophysics of compositionality: Relational scene perception occurs in a canonical order. **Talk** presented at the 24nd Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL.
- Sun, Z., & McDougle, D. S. (May 2024). Goal uncertainty biases memory for observed actions . **Poster** presented at the 24nd Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL.
- Sun, Z., Hafri, A., & Firestone, C. (May 2023). How to build a scene: Relational representations are constructed in a canonical order. **Poster** presented at the 23nd Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL.
- Sun, Z., Hafri, A., & Firestone, C. (May 2023). How to build a scene: Relational representations are constructed in a canonical order. **Poster** presented at the 23nd Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL.
- Han, S., Sun, Z., & Firestone, C. (May 2023). Caricaturing shape in visual memory. **Poster** presented at the 23nd Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL.
- Sun, Z., Yu, Q., & Firestone, C. (May 2022). How to look unique. **Poster** presented at the 22nd Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL.
- Hafri, A., Sun, Z., & Firestone, C. (May 2022). Sequential construction of visual relations. **Poster** presented at the 22nd Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL.
- Sun, Z., & Firestone, C. (November 2021). The evolution of complexity in visual memory. **Poster** presented at the 29th annual meeting for Object Perception, Attention, and Memory, Online.
- Yu, Q., & Sun, Z. (November 2021). Looking Unique. **Talk** given at the 29th annual meeting for Object Perception, Attention, and Memory, Online.

- Sun, Z., Han. S., & Firestone, C. (May 2021). The evolution of complexity in visual memory. **Talk** given at the 21th annual meeting of the Vision Sciences Society, Online
- Sun, Z., & Firestone, C. (June 2020). The simple and the beautiful: An aesthetic preference for medially complex stimuli. **Poster** given at the 20th annual meeting of the Vision Sciences Society, Online
- Halberda, J., Yu, Q., Sun, Z., & Firestone, C. (June 2020). Not too simple, not too complex: The Goldilocks principle drives discrimination and search. **Poster** presented at the 20th Annual Meeting of the Vision Sciences Society, Online
- Sun, Z., & Firestone, C. (November 2019). Speaking about seeing: How verbal descriptions encode visual complexity. **Talk** given at the 27th annual meeting of Object Perception, Attention, and Memory, Montreal, Canada.
  — **Award of Best Talk**
- Sun, Z., & Firestone, C. (May 2019). Speaking about seeing: How verbal descriptions encode visual complexity. **Poster** presented at the 19th Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL.
  — **Travel Award**
- Sun, Z., & Firestone, C. (May 2018). Curious objects: Preattentive processing of object complexity. **Talk** given at the 18th annual meeting of the Vision Sciences Society, St. Pete Beach, FL.

Honors and Awards

- **G. Stanley Hall's Scholar Award** 2022
  - Annual award to a graduate student who has demonstrated exceptional scholarly progress in dissertation research, Johns Hopkins
- **Clark Collaborative Award** 2021
  - Award to students who initiate cross-lab collaborative projects The complexity of coding, Johns Hopkins
- **The Mary Ainsworth Award** 2021
  - Annual award to an outstanding female student, Johns Hopkins
- **The Robert S. Waldrop Junior Investigator's Award** 2019
  - Annual award to a graduate student who has demonstrated exceptional scholarly progress in pre-dissertation graduate research, Johns Hopkins
- **OPAM Best Talk Award** 2019
  - Talk given at the annual meeting of Object Perception, Attention, and Memory, Montreal
- **Elsevier/Vision Research Travel Award** 2019
  - The 19th annual meeting of Vision Science Society, St. Pete Beach, FL
- **Collaborative Research Award** 2018
  - Department award to support a project of Goldilocks principle in memory, Johns Hopkins
- **Graduate Student Award** 2015; 2016
  - Chinese Academy of Sciences

Invited Talks

- Perception and Action Seminar, Brown University 2025.09.25
- The Skilled Action and Memory Lab, University of Birmingham 2025.07.30
- Cognitive Current Works, Yale University 2025.02.12
- The Action, Cognition and Thinking Lab, Yale University 2022.06.09
- Behrmann Lab, Carnegie Mellon University 2022.04.27
- The Computational Vision and Learning Lab, University of California, Los Angeles 2022.04.15
- The Language and Cognition Lab, Stanford University 2022.01.11
- Cognitive Tools Lab, University of California, San Diego 2021.10.06
- The Computation and Language Lab, University of California, Berkeley

Teaching

- **Real World Human Data (TA)** Spring 2020
  Johns Hopkins University
- **Methods in Experimental Psychology (TA)** Fall 2019
  Johns Hopkins University
- **Introduction to Cognitive Psychology (TA)** Spring 2019
  Johns Hopkins University
- **Introduction to Social Psychology (TA)** Fall 2018
  Johns Hopkins University

Skills

- **Programming**
  Python, JavaScript, Matlab, R
- **Analysis**
  behavioral data, eye tracking data, fMRI data

Training

- **Summer School**
  Neuromatch Academy - Computational Neuroscience (Interactive track)

Service

Early Career Colloquium Selection Committee Johns Hopkins
Student organizer Fall 2020

Summer Internship Program Johns Hopkins
Mentor, Vision Group Summer 2019

- Project: Shape bias and complexity bias
- Mentee: Subin Han, Cognitive Science Department, JHU

Department Colloquium Committee Johns Hopkins
Student organizer Fall 2019

Editorial work

Intern Junior Editor 2025–2026
Journal of Experimental Psychology: Human Perception and Performance

Ad hoc reviewer

- *Attention, Perception, and Psychophysics*
- *Synthese*
- *Philosophical Transactions of the Royal Society B*
- *Journal of Experimental Psychology: General*
- *Journal of Experimental Psychology: Human Perception and Performance*
- *Journal of Cognitive Neuroscience*
- *Perception*