

Sarah Brogden Payne

DEPARTMENT OF LINGUISTICS AND INSTITUTE FOR ADVANCED COMPUTATIONAL SCIENCE

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Education

Stony Brook University

PH.D., LINGUISTICS

- Institute for Advanced Computational Science Graduate Research Fellow

Stony Brook, NY

Entered Fall 2022

University of Pennsylvania

B.A, LINGUISTICS (WITH DISTINCTION) & COMPUTER AND INFORMATION SCIENCE

- Minor: Cognitive Science
- Honors thesis: "When Collisions are a Good Thing: the Acquisition of Morphological Marking" advised by Dr. Charles Yang
- Summa cum laude (GPA: 3.93/4.0)

Philadelphia, PA

May 2022

Indiana University Bloomington

DUAL ENROLLMENT, MATH & COMPUTATIONAL LINGUISTICS

- GPA: 4.0/4.0

Bloomington, IN

2017-18

Research Interests

Language Acquisition: phonological, morphological, and syntactic acquisition; language in the mind & brain; bilingual acquisition; syntax-semantics interface in acquisition; sparsity of the input; experimental methods; learnability

Computational Linguistics: algorithmic models of acquisition; word learning; computational approaches to phonology, and morphology, and syntax

Natural Language Processing: robustness; bias, bias mitigation, and bias analysis in large-scale models

Awards & Fellowships

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| 2022 | Graduate Fellow , NSF Graduate Research Fellowships Program |
| 2022 | Graduate Fellow , Institute for Advanced Computational Science Graduate Research Fellowship |
| 2022 | Dean's Scholar , University of Pennsylvania |
| 2022 | Henry Hoenigswald Thesis Prize in Linguistics , University of Pennsylvania |
| 2022 | Honorable Mention , NDSEG Graduate Fellowship |
| 2021 | Elected to Phi Beta Kappa , University of Pennsylvania |
| 2018-19, 2021-22 | Dean's List , University of Pennsylvania (<i>Temporarily discontinued due to COVID-19</i>) |

Publications

PEER-REVIEWED CONFERENCE PROCEEDINGS

Caleb Belth, **Sarah Payne**, Deniz Beser, Jordan Kodner, & Charles Yang (2021). *The Greedy and Recursive Search for Morphological Productivity*. Proceedings of the 43rd Annual Meeting of the Cognitive Science Society. 42(1):2869-2875.

Deniz Beser, Joe Cecil, Marjorie Freedman, Jacob Lichtefeld, Mitch Marcus, **Sarah Payne**, & Charles Yang (2021). *A Grounded Approach to Modeling Generic Knowledge Acquisition*. Proceedings of the 43rd Annual Meeting of the Cognitive Science Society. 42(1):2450-2456.

Sarah Payne, Jordan Kodner, & Charles Yang (2021). *Learning Morphological Productivity as Meaning-Form Mappings*. Proceedings of the Annual Meeting of the Society for Computation in Linguistics. 4(1):177-187.

MANUSCRIPTS

Sarah Payne (2022). *When Collisions are a Good Thing: the Acquisition of Morphological Marking*. Senior Thesis in Linguistics, University of Pennsylvania.

Ryan Gabbard, Deniz Beser, Jacob Lichtefeld, Joe Cecil, Mitch Marcus, **Sarah Payne**, Charles Yang, & Marjorie Freedman (2021). *ADAM: A Sandbox for Implementing Language Learning*. ArXiv, abs/2105.02263.

Presentations

Sarah Payne, Caleb Belth, Jordan Kodner, & Charles Yang (2022). *Searching for Morphological Productivity*. Talk given at the 96th Meeting of the Linguistics Society of America.

{Caleb Belth, **Sarah Payne**}, Jordan Kodner, & Charles Yang (2021). *Searching for Morphological Productivity*. Talk given at the 46th annual Boston University Conference on Language Development.

Sarah Payne, Caleb Belth, Jordan Kodner, & Charles Yang (2021). *The Recursive Search for Morphological Productivity*. Poster presented at the 5th Annual American International Morphological Meeting.

Sarah Payne, Peng Qian, Ethan Wilcox, & Roger Levy (2021). *Particle Filtering with Neural Language Models: Modelling the Effects of Memory on Incremental Sentence Processing*. Poster presented at the MIT Center for Brains, Minds and Machines Summer Research Poster Session.

Ryan Gabbard, Jacob Lichtefeld, Deniz Beser, Joe Cecil, Mitch Marcus, **Sarah Payne**, Charles Yang, & Marjorie Freedman (2021). *Grounding Word Learning Across Situations*. Poster presented at the 43rd Annual Meeting of the Cognitive Science Society.

Sarah Payne (2019). *Categorization of Novel Referents by a Seeing Eye Dog*. Talk given at the University of California Berkeley Undergraduate Linguistics Symposium.

Sarah Payne & Chris Callison-Burch (2019). *From Word Meaning to Phrase Meaning: Compositionality*. Poster presented at the University of Pennsylvania Center for Undergraduate Research Poster Session.

Research Experience

Center for Brains, Minds, and Machines Summer Research Fellow, MIT

Cambridge, MA

ADVISOR: DR. ROGER LEVY

2021

- Worked in the Computational Psycholinguistics Lab to model working memory limitations on incremental processing of garden path sentences
- Implemented particle filtering with neural language models and compared surprisal results to human reading times

Research Assistant Intern, Information Sciences Institute (ISI)

Waltham, MA

ADVISORS: DR. RYAN GABBARD & DR. MARJORIE FREEDMAN

2020

- Collaborated with researchers at ISI and Penn on the ADAM project under DARPA's Grounded Artificial Intelligence Language Acquisition Program to create a cognitively-plausible learner that learns from concrete situations and syntactic bootstrapping
- Implemented the system in Mandarin Chinese by eliciting native speaker judgments and writing a Chinese language generator

Visiting Research Assistant

College Park, MD

ADVISOR: DR. DAN SWINGLEY, DR. THOMAS SCHATZ, & DR. NAOMI FELDMAN

2020

- Funded by MindCORE to travel to the University of Maryland during January 2020
- Used bottleneck features in Kaldi to develop phone embeddings that can be tested against human judgement

Research Assistant, Infant Language Center

Philadelphia, PA

ADVISOR: DR. DAN SWINGLEY

2019-20

- Created phoneme embeddings based on Bottleneck Features that are optimized to mimic the perception of an infant
- These embeddings will be helpful for computationally modeling phenomena such as categorical perception

Penn Undergraduate Research Mentoring Program (PURM)

Philadelphia, PA

ADVISOR: DR. CHRIS CALLISON-BURCH

2019

- Generated phrase embeddings from word embeddings, incorporating visual and syntactic information to create a model that beats previous baselines by approximately 20%.

Research Assistant, Multimodal Embeddings

Philadelphia, PA

ADVISOR: DR. CHRIS CALLISON-BURCH

2018-19

- Collaborated with students at Penn and Swarthmore to create multi-modal embeddings by imagining mappings from words to images
- Produced embeddings that provide a baseline for future experiments and can be utilized in various NLP tasks.

Teaching Experience

- Fall 2021 **CIS 380: Operating Systems**, Teaching Assistant, *University of Pennsylvania*
Spring 2021 **CIS 240: Intro to Computer Architecture**, Teaching Assistant, *University of Pennsylvania*
Fall 2020 **NETS 212: Scalable and Cloud Computing**, Teaching Assistant, *University of Pennsylvania*
Spring 2019 **CIS 192: Intro to Python**, Teaching Assistant, *University of Pennsylvania*

Other Work Experience

Teaching Assistant (TA) Trainer

Philadelphia, PA

UNIVERSITY OF PENNSYLVANIA SCHOOL OF ENGINEERING

Jan. 2021- 2022

- Work with other experienced teaching assistants to lead training sessions for incoming TAs

Peer Writing Tutor

Philadelphia, PA

UNIVERSITY OF PENNSYLVANIA MARKS FAMILY WRITING CENTER

2019-20

- Helped students at Penn grow as writers by holding weekly appointments and offering drop-in assistance

Service and Outreach

Elected Member, University Council

Philadelphia, PA

UNIVERSITY OF PENNSYLVANIA

2021-22

- Elected to represent the concerns and voices of the anti-violence community and survivors to university administrators

Chair, Abuse and Sexual Assault Prevention (ASAP)

Philadelphia, PA

UNIVERSITY OF PENNSYLVANIA

2021-2022

- Incorporate education, activism, and outreach to spread ASAP's message to a wider audience
- Lead board and general meetings and collaborations; co-host Take Back the Night with other universities in Philadelphia

Board Member, Abuse and Sexual Assault Prevention (ASAP)

Philadelphia, PA

UNIVERSITY OF PENNSYLVANIA

2019-2020

- Facilitated communication and collaboration among several of Penn's anti-violence groups

Liason, Coalition Against Fraternity Sexual Assault (CAFSA)

Philadelphia, PA

UNIVERSITY OF PENNSYLVANIA

2019

- Advocated for the incorporation of anonymous reporting as is now required by the state of Pennsylvania and the removal of Greek life from Penn's Campus

Other

LANGUAGES

Native: British and American English

Intermediate: Spanish, Latin

TECHNICAL SKILLS

Proficient: Python, C, C++, Git, Bash, Linux

Intermediate: Java, R, LaTeX, Amazon Web Services

Beginner: JavaScript, HTML/CSS