

Highlighting the NSF Social, Behavioral, and Economic Sciences (SBE)

Moderated by:

Dr. Frank A. Gomez

Executive Director, STEM-NET, Office of the Chancellor &

Dr. Elizabeth Soto,

Director of Research Operations, Office of the Chancellor



<https://www2.calstate.edu/impact-of-the-csu/research/stem-net>

Speakers

Thomas Woodson & Susan Hirsch, NSF,
Perspectives on NSF Social, Behavioral, and Economic Sciences

James W. Antony, Cal Poly San Luis Obispo,
Testing a Unified Spectral Temporal Context Model of Memory at Cal Poly, SLO

Zena Mello, San Francisco State
Money Matters: Advancing Research on Social Class Discrimination Among Adolescents

Amber Crowell, Fresno State
Mapping the Origins of Urban Residential Segregation Through Open Resources and Collaboration



Perspectives on NSF Social, Behavioral, and Economic Sciences (SBE)

Dr. Susan F. Hirsch
Program Officer
Law and Science

Dr. Thomas S. Woodson
Program Officer
Science of Science

US National Science Foundation: Directorates



Biological Sciences



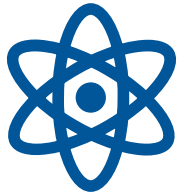
Computer and
Information Science and
Engineering



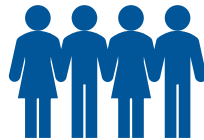
Engineering



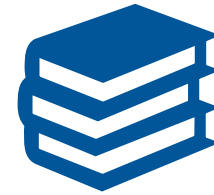
Geosciences



Mathematical and
Physical Sciences



Social, Behavioral and
Economic Sciences



STEM Education



Technology, Innovation
and Partnerships



SBE Leadership

Office of the Assistant Director



Kaye Husbands Fealing
Assistant Director



Evan Heit
Acting Deputy Assistant Director



Division of Behavioral and Cognitive Sciences (BCS)



Joan Sereno
Division Director



Antoinette WinklerPrins
Deputy Division Director



Division of Social and Economic Sciences (SES)



David Barker
Division Director



Alan Tomkins
Deputy Division Director



National Center for Science and Engineering Statistics (NCSES)



Emilda Rivers
Division Director



Christina Freyman
Deputy Division Director



SBE Office of Multidisciplinary Activities (SMA)



SBE - Work We Support - SES



Division of Social and Economic Sciences (SES) advances fundamental understanding of how people live, work and cooperate with one another. The evidence and insight generated help improve quality of life, institutional effectiveness, and economic prosperity.

Accountable Institutions & Behavior
Decision, Risk & Management Sciences
Economics
Law & Science
Methodology, Measurement and
Statistics
Research Infrastructure in the Social
and Behavioral Sciences

Security & Preparedness
Science of Organizations
Science and Technology Studies
Science of Science: Discovery,
Communication and Impact
Secure & Trustworthy Cyberspace
Sociology



SBE - Work We Support - BCS



Division of Behavioral and Cognitive Sciences (BCS) supports research on the brain, human cognition, language, social behavior and culture, including research on the interactions between human societies and their environments.

Archaeology and Archaeometry
Biological Anthropology
Cognitive Neuroscience
Cultural Anthropology
Developmental Sciences
Dynamic Language Infrastructure
Human Networks and Data Science

Human-Environment and
Geographical Sciences
Linguistics
Perception, Action, and Cognition
Science of Learning and Augmented
Intelligence
Social Psychology



SBE - Work We Support - SMA



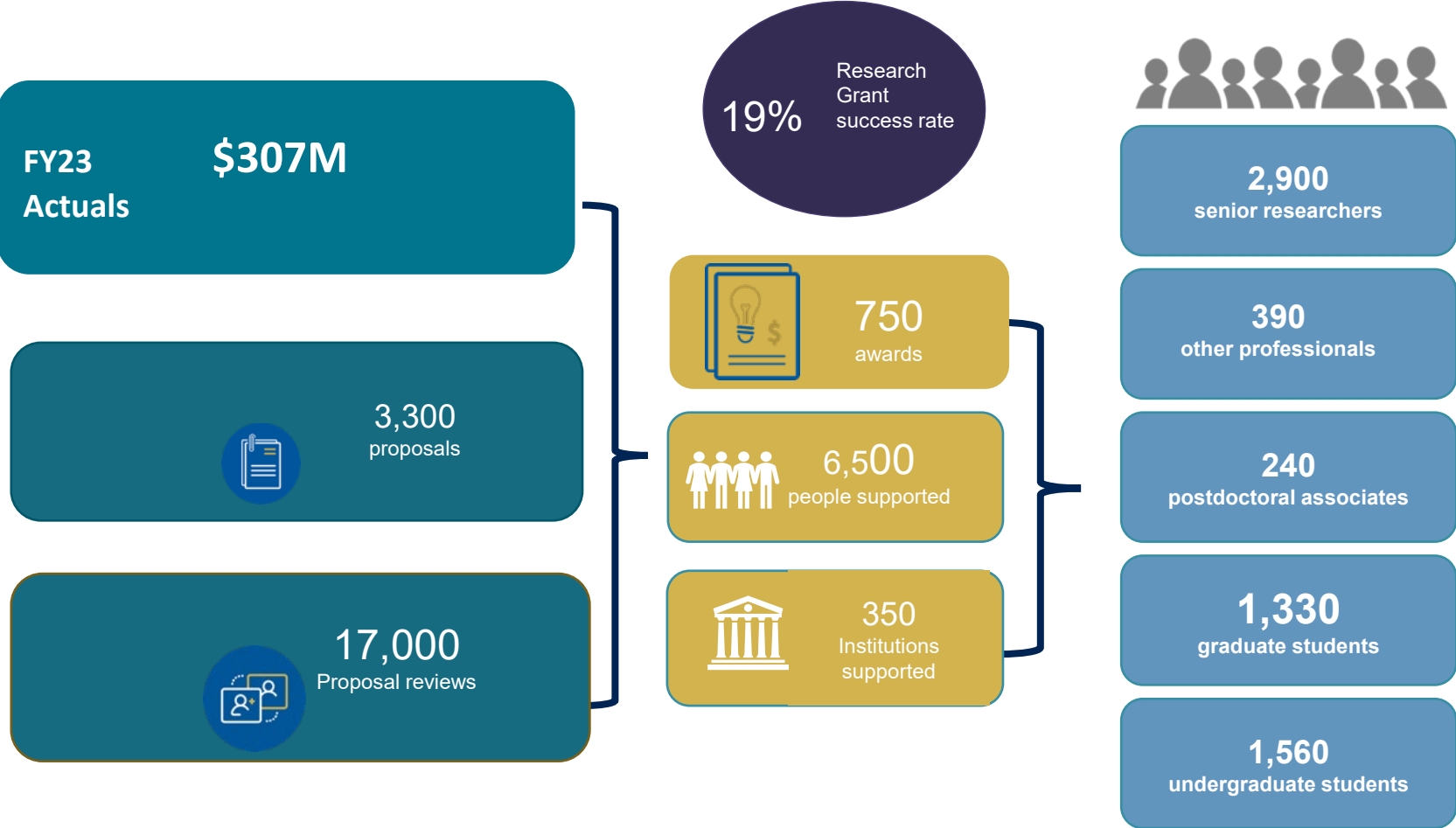
Office of Multidisciplinary Activities (SMA) supports activities that cut across disciplinary boundaries in the SBE Directorate and beyond. It serves as an incubator for new programs and plays a critical role in the development of these programs' supporting infrastructure.

Build and Broaden: Enhancing SBE
Research and Capacity at
Minority-Serving Institutions
Centers for Research and Innovation
in Science, the Environment
and Society
Ethical and Responsible Research
SBE Postdoctoral Research Fellowships

SBE Research Experiences for
Undergraduates Sites
SBE Science of Broadening
Participation
SBE-UKRI Lead Agency
Opportunity



SBE by the Numbers: FY 2023



6,500 people supported across 350 institutions via 750 awards



Law and Science

Supports research that:

produces scientific studies of law and law-like systems

advances scientific theory and understanding of the connections between law or legal processes and human behavior



- LS-research is highly **multi-and inter-disciplinary**.
- LS **co-reviews broadly** and most often with AIB, CA, ECON, HNDS, SAP, SOC.
- LS funds **dissertation awards** through Arizona State University.
- LS holds **separate** CAREER and Standard/Collaborative panels.



Law and Science

LS Topic Areas (among others)

- Crime, Violence, Punishment, and Restorative Practices
- Governance, Rule of Law, and Fundamental Rights
- Legal Decision-Making and the Legal Profession
- Economic Issues
- Legal Consciousness, Legal Culture, and Concepts of Justice
- Discrimination, Equity, and Legal Mobilization
- Litigation and Civil Justice
- AI and the Legal System
- Regulation Biotechnology and other Tech Innovation

LS Scientific Advancements

- Lineups and Eyewitness perception (PSY)
- Studies of juries, testimony, and bias (PSY)
- Judicial decision-making (PS)
- Comparative Legal Institutions (PS)
- Policing (SOC)
- Legal Consciousness (SOC & ANTH)
- Access to Justice



LS

- Neal, Measuring the **Objectivity and Bias of Experts** (2002283)
- Evans, **Conference: Judicial Independence and Rule of Law** Across the Globe (2227624)
- Cheng, CAREER: The Pseudo-State Entities of **Street-Level Bureaucrats** (2338871)
- Statz, **Access and Justice** across Tribal and State Courts (2215074)
- Moncada, **RUI: Criminal Competition and Collective Political Mobilization in Comparative Perspective** (2416429)

LS

&

SBP

- Ballakrishnen, **Diversity and Networking in Law School** (2147011)
- Andersen, Understanding How **Mentoring** Can Disrupt the School-to-Prison Pipeline and Promote Positive Youth Development (2234344)
- Davis, CAREER The Political Use of Law in the **Enforcement of Voting Rights** (2231729)
- Battle, **Examining Compliance, Criminalization, & Carcerality** in Legal Systems (2341167)

Science of Science: Discovery, Communication and Impact

Supports research focused on advancing knowledge and theory on the social science of

1. The social and structural mechanisms of scientific discovery.
2. Theories, models and data improving our understanding of scientific communication
3. The societal benefits of scientific activity and how science advances evidence-based policy making and the creation of public value



Science of Science

Discovery

- Science teams, collaboration, gender, race, disability in STEM
- Participatory science, community science, innovation systems
- Science funding mechanisms, effectiveness of science policies

Communication

- Misinformation, science communication, citizen science
- Communication/evidence to policy makers

Impact

- R&D outcomes, development, research outputs (pubs, cites, etc)
- Broadening participation, equity, policy, action



D

- Collaborative Research: An **evidence-based approach** towards technology workforce expansion by increasing female participation in STEM entrepreneurship. 2100139 PI: J, Eckhardt & B, Goldfarb
- Approaches toward **External Validity of Randomized Controlled Trials** in the Social Sciences 2318659; PI N, Egami
- **Randomized Control Trial of the Registered Reports** Publishing Format 2152424, PI B. Nosek

C

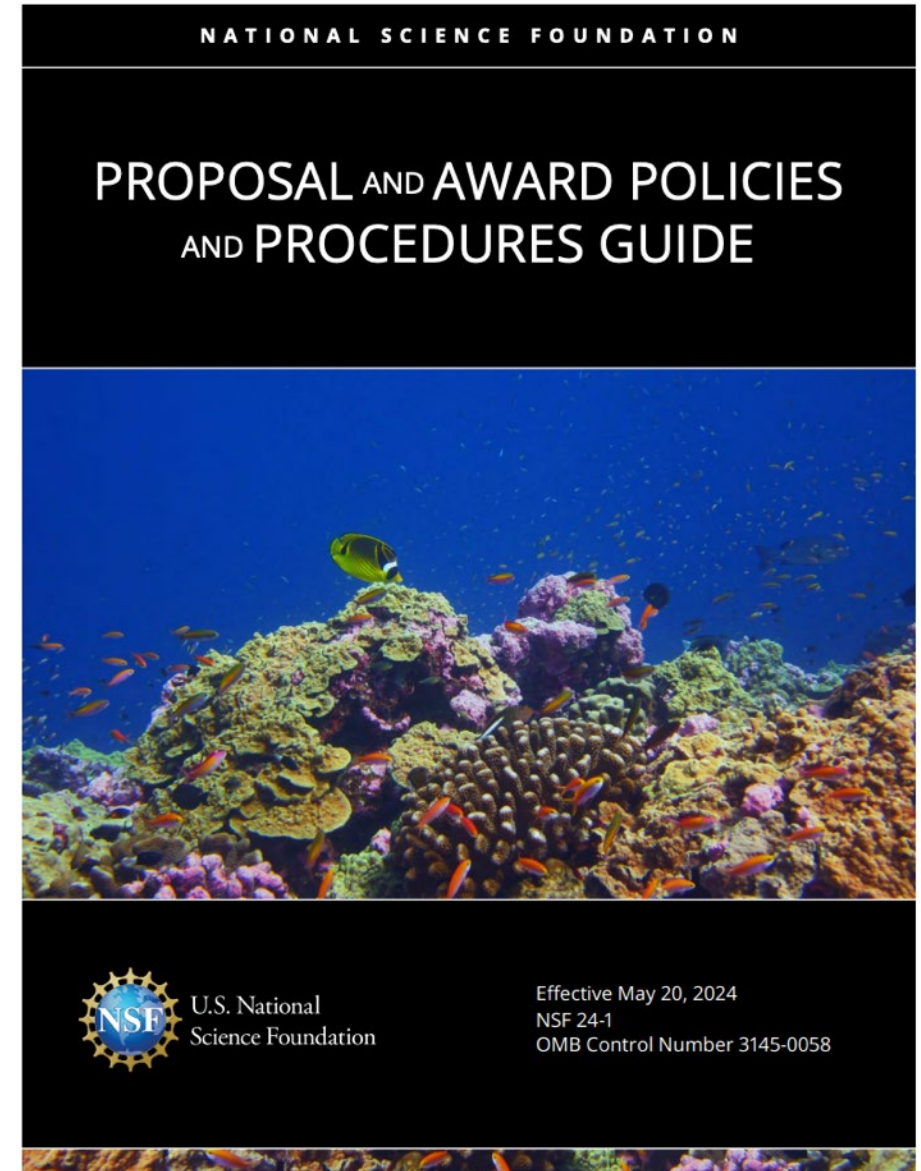
- Inequity & mistrust of scientific information – understanding science misinformation in Black communities & developing **community-driven science** communication strategies. 2219604 PI M. Xenos, Co-PIs: T Newman & L Williamson
- **Testing strategies & impacts** of communicating the value of museum biological collections. PI: Adrian Smith, Co-PI N. Lee
- **Integrating Spiritual, Moral and Ethical Considerations into Science Communication for Improved Decision Making and Public Action on Climate Science** 2318681. PI J. Eise

I

- R&D outcomes, Improving the **use of science in collaborative environmental governance**. 2122247 PI C. Thomas, Co-PI T. Koontz
- CAREER: Assessing the effect of source credibility on **public perceptions of science and place-based conservation**. 2143843 PI: D. Wald
- Partisanship and Innovation: Exploring the Link between **Partisanship and the Rate and Direction of Inventive Activity** 2244885. PI F. Teodoridis

Proposal and Award Policies and Guide

Key rules and regulations when writing grants



NSF Proposal Preparation and Submission

- Proposals to NSF must be submitted via Research.gov, Grants.gov, or the Broad Agency Announcement Management (BAAM) System.

Note: for most proposals you will use Research.gov

The screenshot shows the Research.gov homepage with a navigation bar at the top containing 'Sign In', 'Register', 'Home', 'Contact', and 'Help'. The main content area features several notification boxes: a red one for maintenance on Saturday, 7/13; a yellow one for a new FFDR Office Hours session on July 16; and a blue one for CAREER proposers. Below these is a 'Show all notifications' link. A large teal banner announces that 'Reviewers are now in Research.gov!' and provides a 'Learn More' button. The bottom section is divided into four columns: 'Prepare & Submit Proposals', 'Proposal/Panel Review', 'Awards & Reporting', and 'Fellowships & Honorary Awards', each with a list of related links.

research.gov/research-web/

NSF Research.gov
ONLINE GRANTS MANAGEMENT
FOR THE NSF COMMUNITY

Sign In | Register | Home | Contact | Help

Due to maintenance, Research.gov (including access to GRFP and NSF-PAR) and FastLane will be unavailable on Saturday, 7/13 from 12:01 AM ET – 8:00 AM ET. We apologize for any inconvenience.

NEW: The Foreign Financial Disclosure Report (FFDR) Office Hours session **on July 16 will be a webinar** instead of Office Hours to further assist the research community. The session on July 31 will be Office Hours. Click [here](#) for registration link and July 9 webinar materials.

CAREER Proposers: Click [here](#) for CAREER proposal system-related FAQs. Research.gov proposal training resources (e.g., how-to guides) are available on the Research.gov About Proposal Preparation and Submission page.

[Show all notifications](#) (Viewing 3 of 5 notifications)

Reviewers are now in Research.gov!
Participants added to NSF meetings (including panel, site visit, advisory committee, subcommittee, and committee of visitors) can now manage their profile in Research.gov. [Learn More](#)

Provide Reviewer Profile Information

Prepare & Submit Proposals
Prepare, submit and check status of proposals

- Letters of Intent and Proposals
- Demo Site: Prepare Proposals
- Check Proposal Status

Proposal/Panel Review
Review proposals, participate in panels

- Proposal Review
- Panelist Functions

Awards & Reporting
Submit project reports, notifications & requests, and supplemental funding requests

- Project Reports
- Demo Site: Project Reports (Training)
- Notifications & Requests
- Deposit Public Access Publication
- Award Documents
- Supplemental Funding Requests (including Career-...

Fellowships & Honorary Awards
Nominate colleagues, apply for awards

- Graduate Research Fellowship Program (GRFP)
- Honorary Awards
- Manage Reference Letters (Writers)



Intellectual Merit

criterion encompasses the potential to advance knowledge

Significance: How important is the proposed activity in advancing knowledge within its own field or across different fields?

Creativity: How innovative and original are the concepts and approaches?

Approach: Are the methods and analysis plan well-reasoned, well-organized, and based on a sound rationale?

Qualifications: Are the investigators well-qualified (e.g., the team, their knowledge, and other resources)?

Resources: Are there sufficient resources available to carry out the proposed activities?

Broader Impact:

criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

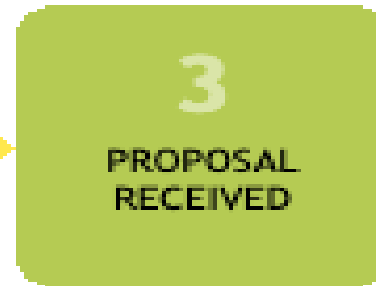
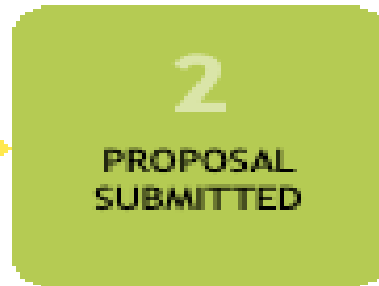
- **Societal Benefits:** How well does the activity advance discovery and understanding while promoting teaching, training, and learning?
- **Diversity:** How well does the activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic)?
- **Dissemination:** How effectively will the results be disseminated to enhance scientific and technological understanding?
- **Benefits Beyond Science:** How well will the activity benefit society in terms of improved economic competitiveness, environmental sustainability, public health, or other areas?



NSF Merit Review Process

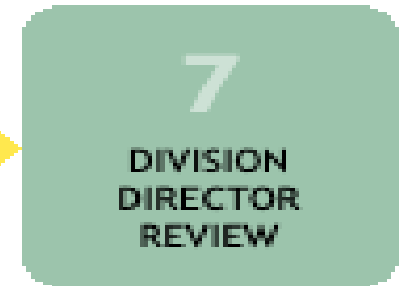
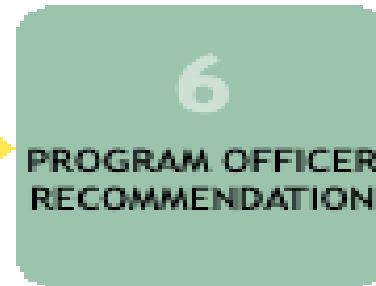
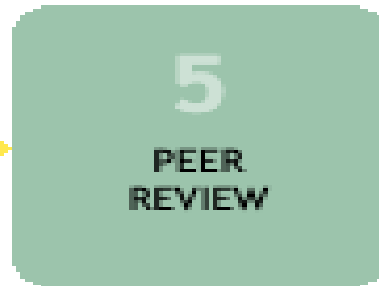
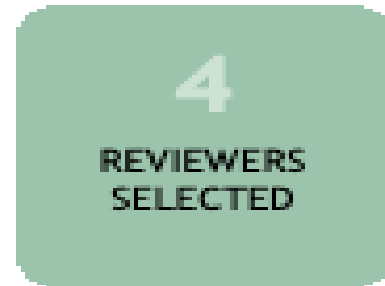
PHASE I

PROPOSAL
PREPARATION
AND SUBMISSION
90 DAYS



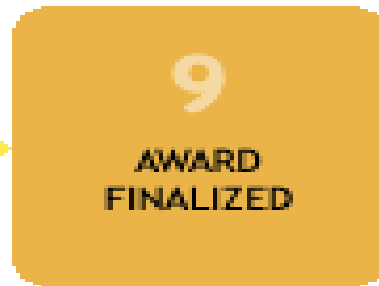
PHASE II

PROPOSAL
REVIEW AND
PROCESSING
6 MONTHS



PHASE III

AWARD
PROCESSING
30 DAYS



https://www.nsf.gov/bfa/dias/policy/merit_review/

Questions?





Testing a Unified Spectral Temporal Context Model

James Antony – Cal Poly

Collaborators (if any):

Kelly Bennion – Cal Poly

Maya Geva-Sagiv – UC Davis

Charan Ranganath – UC Davis

James Antony, Assistant Professor

Cal Poly, SLO, Department of Psychology

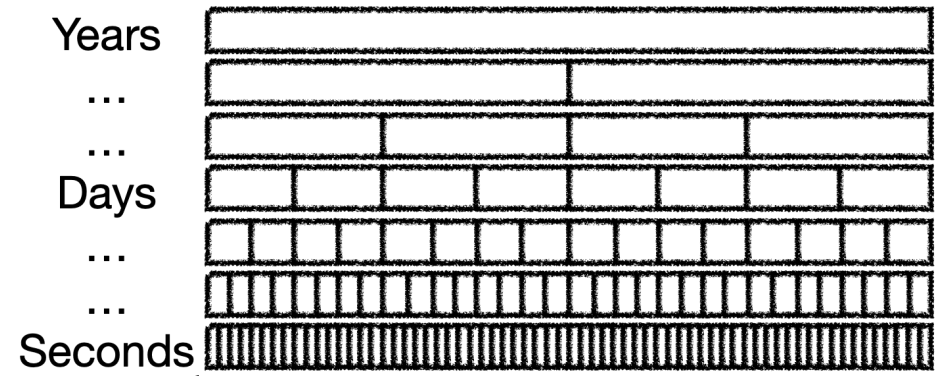
jwantony@calpoly.edu



Project Overview

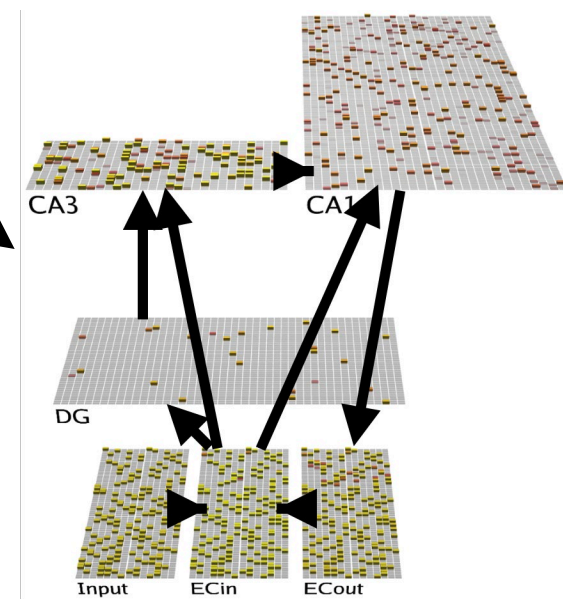
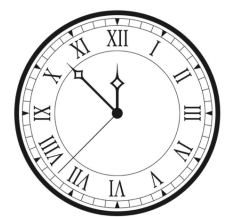
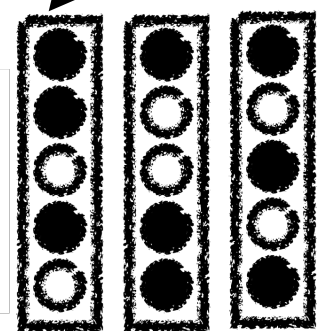
Explain...

- Forgetting curves
- Spacing effects
- Interference patterns



Testing a unified spectral temporal context model

at Cal Poly, SLO

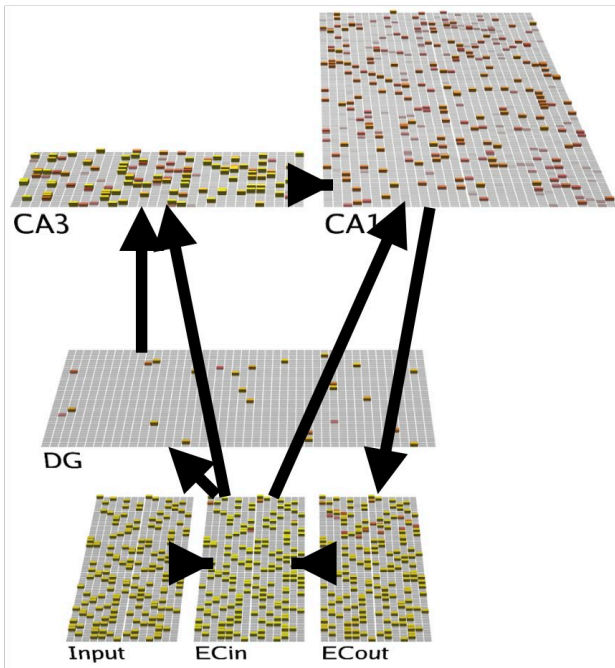




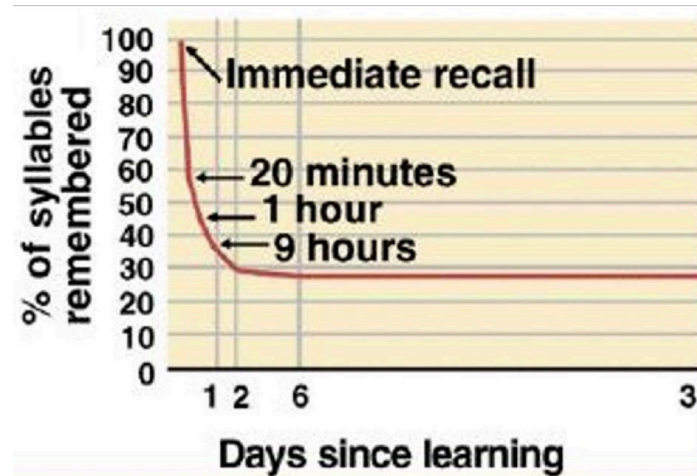
Testing A Unified Spectral Temporal Context Model

Aim 1A: create a biologically inspired computational model of the hippocampus that can explain time-related memory findings ...

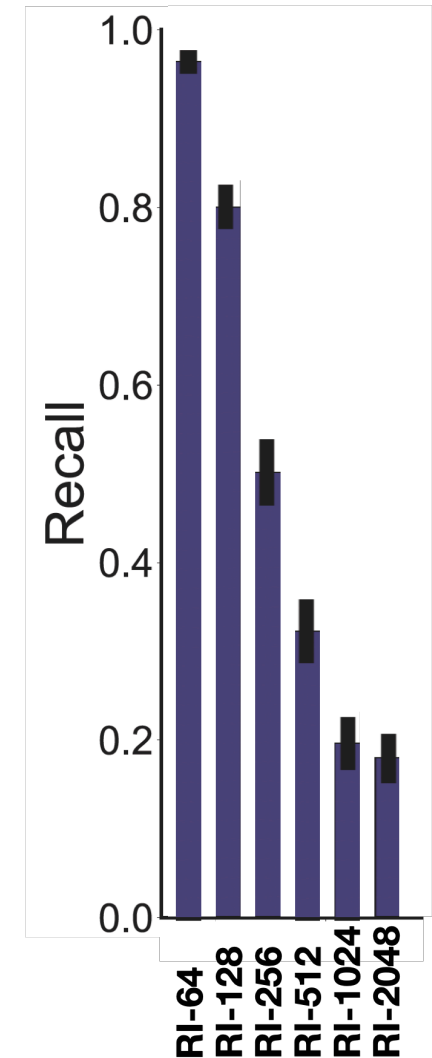
Computational model of hippocampus



Forgetting curve (Ebbinghaus, 1885)



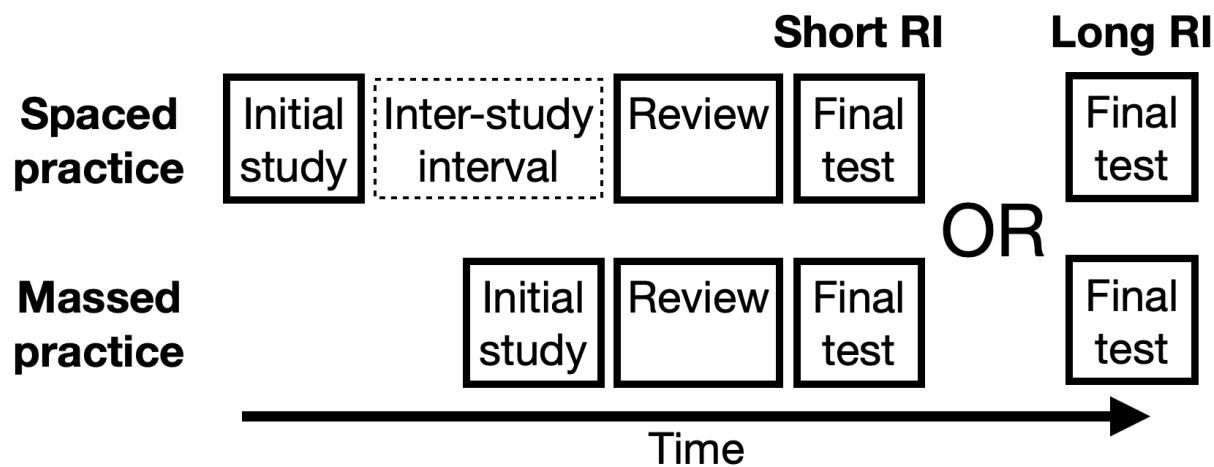
Forgetting curve - model (Antony et al., 2024)





Aim 1A: create a biologically inspired computational model of the hippocampus that can explain time-related memory findings ...

Spacing effect paradigm

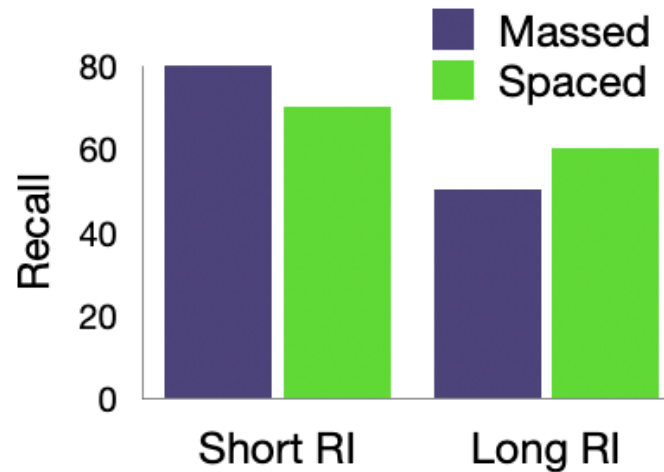


Key points:

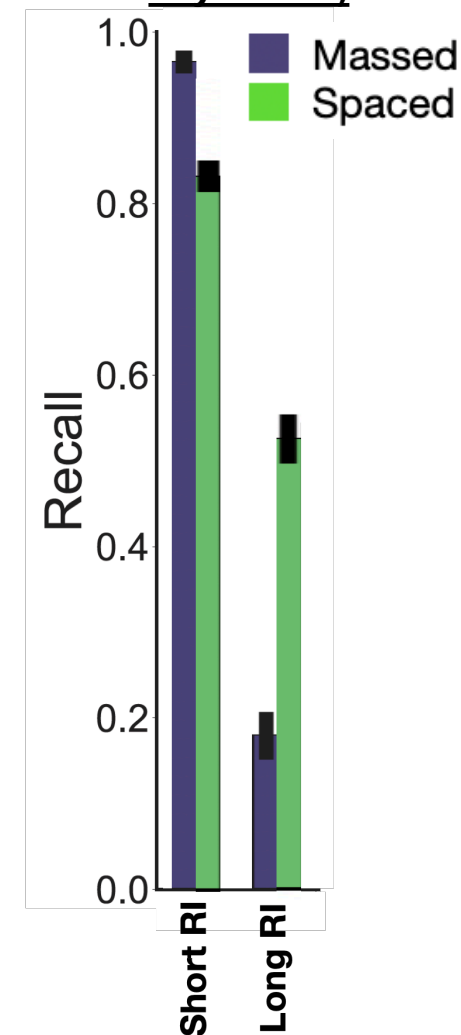
Greater drift (longer time) -> weaker overlap between stored and current context -> **forgetting**

Greater drift (longer time) -> greater error between stored and current context -> greater error-driven learning -> **spacing effects**

Typical memory effects



Model simulations (Antony et al., 2024, Psych Rev)



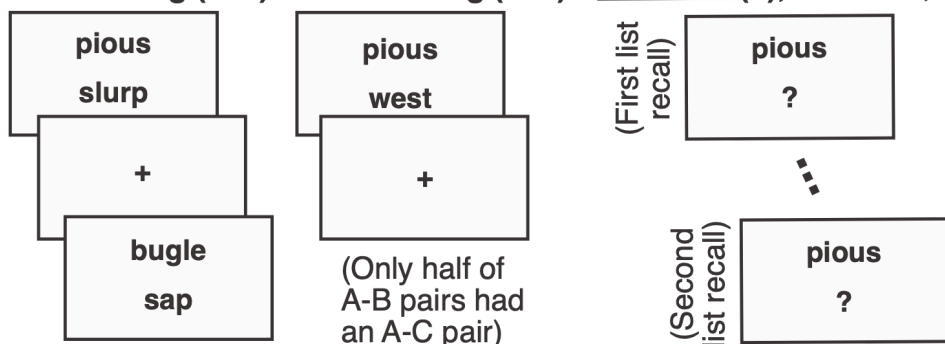


Testing A Unified Spectral Temporal Context Model

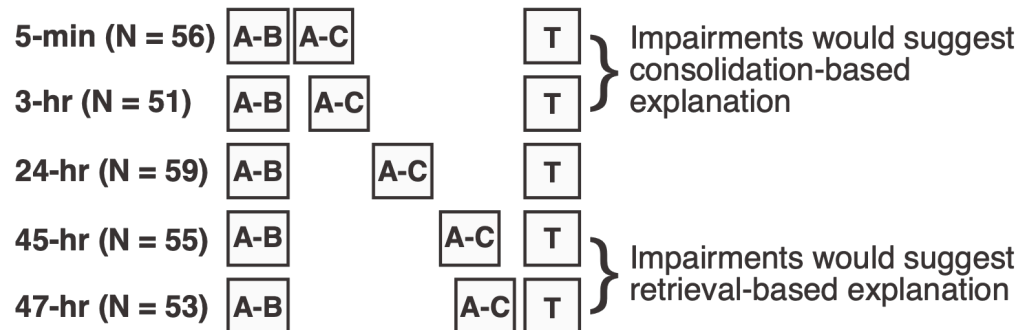
Aim 1B: examine interactions between memory interference and timing

Behavioral experiment methods (N = 274)

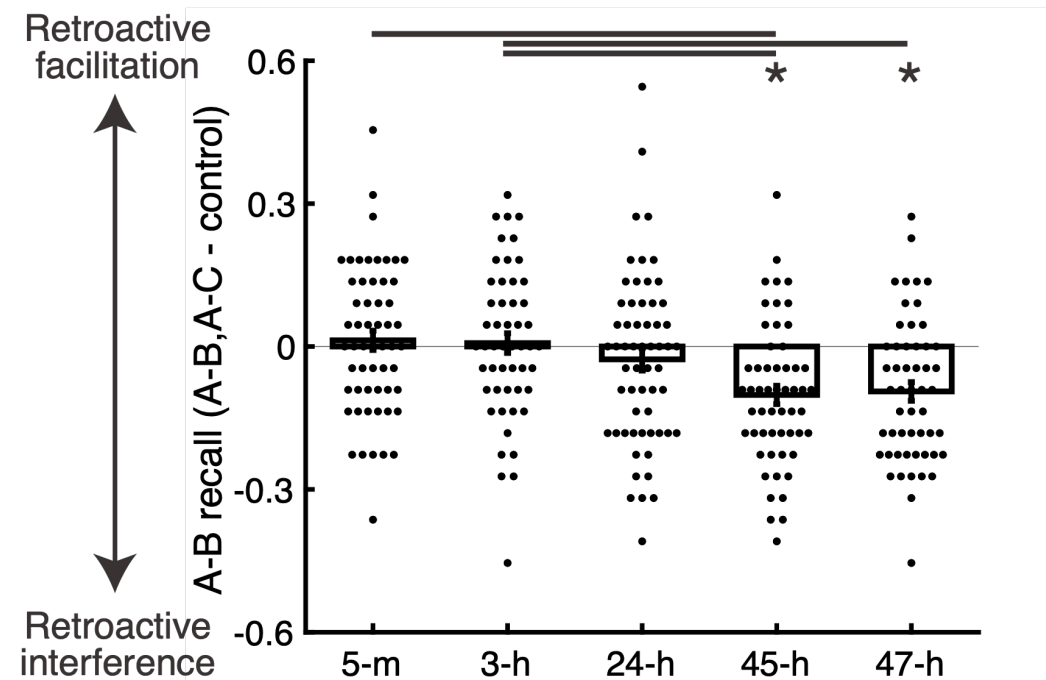
Initial learning (A-B) Later learning (A-C) Final test (T), A-B&A-C, 48-hr



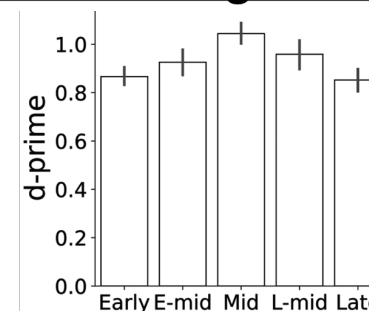
Conditions



Retroactive interference only occurs when new learning occurs right before testing



Model: interference right after new learning and right before testing... must investigate



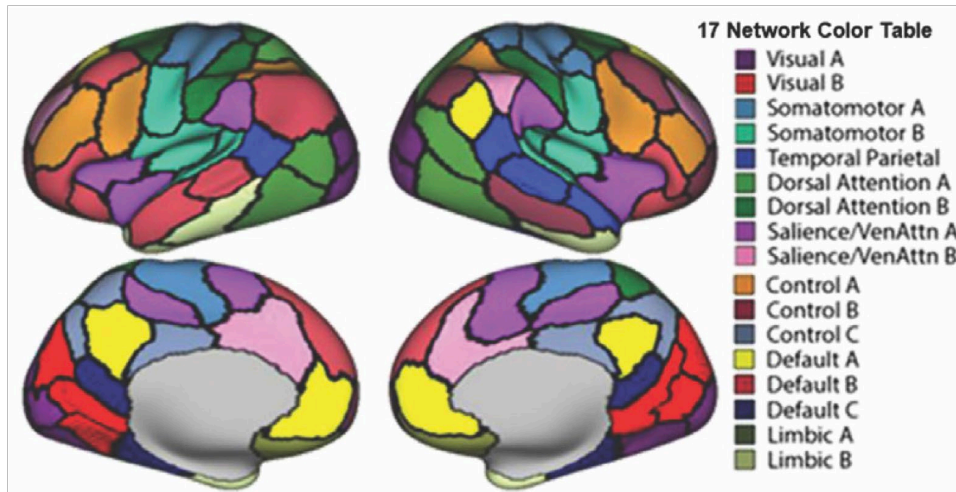


Testing A Unified Spectral Temporal Context Model

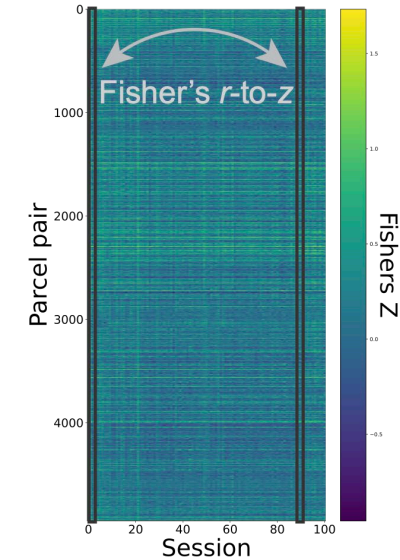
Aim 2: we test neural predictions of the framework that drift occurs at long timescales (>1 year)

Open data: One individual underwent fMRI scanning 101 times across 15 months (Poldrack et al., 2014)

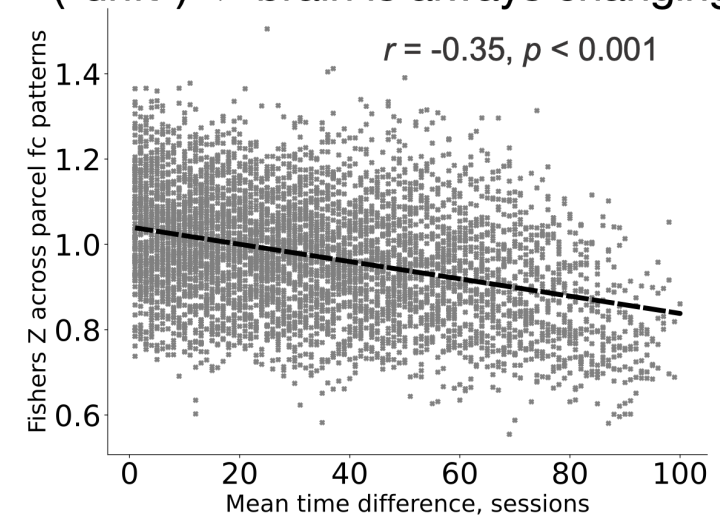
Measured activity patterns in 100 cortical parcels



Connectivity matrix for all pair of parcels in every session (“snapshot” of brain activity)



Brain patterns become more dissimilar over time (“drift”) -> brain is always changing!



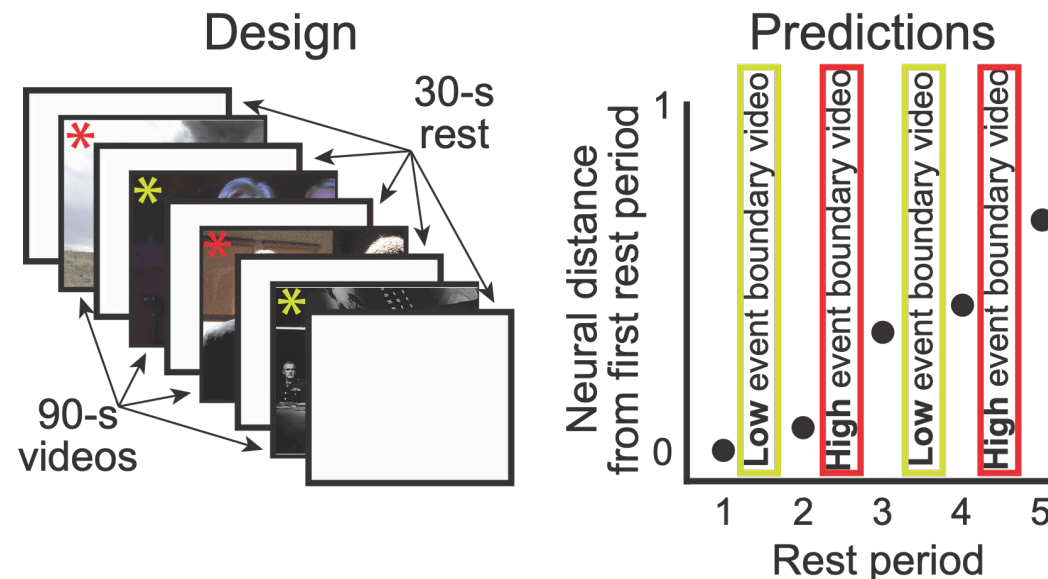


Testing A Unified Spectral Temporal Context Model

Next steps - Aim 3: explore a drift vs. shift framework intracranial neural study

Context does not only passively drift but can also shift more rapidly (e.g., task switching)

Can we measure both drift and shift in neural signals using movies with lots of perspective changes (event boundaries)?



Data collected from patient undergoing brain surgery for intractable epilepsy (at UC Davis hospital)

Two patients collected so far!



Summary

Our computational model captured several time-related memory effects (Aim 1A)

In-the-moment memory is not the best predictor of later memory; difficulty = desirable (Bjork, 1994)

Memory interference was greatest right before a test (Aim 1B)

Educational takeaway: don't study something that's related to a test you're about to take

Divergence from model predictions: we will adjust the model and gain insight

Brain activity patterns drift over time (Aim 2)

Our brain networks are constantly changing!

Next steps: see how drift interacts with more sudden task-based “shifts” (Aim 3)



Acknowledgements/Questions?

Co-PIs:

Kelly Bennion (Cal Poly)

Charan Ranganath (UC Davis)

Maya Geva-Sagiv (UC Davis)

Other collaborators:

Randy O'Reilly (Obelisk)

Nora Wolf (UC Davis)

Cal Poly undergrads (study design & data collection)

NSF #2122550

Paper: Antony, J., Liu, X. L., Zheng, Y., Ranganath, C., & O'Reilly, R. C. (2024).

Memory out of context: Spacing effects and decontextualization in a computational model of the medial temporal lobe. *Psychological Review*

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[@jameswardantony](https://bsky.social/@jameswardantony)
bsky.social



SAN FRANCISCO
STATE UNIVERSITY

Money matters: Advancing research on social class discrimination among adolescents

Zena R. Mello – San Francisco State University

Collaborators:

Vani Kakar, San Francisco State University

Zena R. Mello, Full Professor

San Francisco State University, Department of Psychology

zmello@sfsu.edu

Project Overview

- To address large achievement gaps for adolescents disadvantaged in social class, research will determine if social class discrimination explains how social class affects academic outcomes.
- Social class discrimination refers to the bias and prejudice adolescents experience because of their social class. We will transform the field by developing the first measure of social class discrimination among adolescents.
- Research includes a team of unrepresented students who will collect survey and interview data from adolescents at high schools that Mello has established decade-long partnerships.

Activities

- Human subjects
 - Institutional Review Board (IRB#2021-430), High School Principals' approval
- Recruited participants
 - Announcements: classes, hallways, tabled
- Trained team to conduct Interviews
 - 1 Postdoc, 3 Graduate, 4 Undergraduate
 - International, undocumented, first-generation, racial/ethnic minority
 - Met weekly to develop interviewing skills
- Participants
 - 23 adolescents ($M_{age} = 16.50$, $SD_{age} = 1.16$)
 - 2 teachers ($M_{age} = 55$, $SD_{age} = 5$)
 - Race/Ethnicity: Asian/Asian American (50%), European American/White (4%), Hispanic/Latinx (16%), African or African American/Black (12.5%), Mixed/biracial (12.5%), Missing (4%).
 - Gender: Men (54.20%) and Women (45.80%)
 - Adolescent Social Class:
 - 56.52% of parents earned a college degree or more
 - 34.78% of mothers earned less than a college
 - 8.60% missing data



Results

- **Social class discrimination**
 - *“ People are definitely made fun of for the brands of clothes they wear..like their laptop or their phone, materialistic things They definitely make fun of if ...”* (age 17).
 - *“.. I remember in elementary school,..your parents would come and show their job.....when somebody asked me what my mom's job was, and I told them she cleans houses. They said, 'Oh, that was boring.’”* (age 16).
 - *“..I've seen it [social class discrimination] myself ...they'll look at the shoes they're wearing, or how they're dressed.....Make fun of them”* (age 16).
- **Team**
 - Sally Casanova Predoctoral Fellowship (Abundis-Morales)
 - Chancellor's Doctoral Incentive Program (Centeno)
 - 5 Peer-reviewed conference presentations

Lessons Learned

- Social class discrimination
 - Is reported by adolescents
 - Includes teasing about clothing, jobs
- Partnerships
 - Collaborations with schools
 - Access, recruitment
 - We are “school family”
- Team
 - Large, diverse



Next Steps/Long-Term Plans

1. Complete analyses of interviews
2. Develop preliminary measure of social class discrimination
3. Administer survey to 1,500 adolescents to finalize measure
4. Inform larger longitudinal study to determine if social class discrimination predicts academic outcomes in high school

Summary

- New way to understand how social class affects adolescent academic achievement. Social class discrimination research has potential to improve the lives of adolescents.
- Team is diverse, comprising underrepresented, first-generation, and international students.
- Community-engaged research including long-term partnerships with high schools is fruitful.



Questions?



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San Francisco State University

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X: @MelloLab

Funded by the National Science Foundation “*EAGER: Developing a new tool to measure discrimination based on social class for adolescents*” and *Research Experiences for Undergraduates* (REU; 2317285). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation

Mapping the Origins of Urban Residential Segregation through Open Resources and Collaboration

Amber R. Crowell – California State University, Fresno

Collaborators:

Mark Fossett, Texas A&M University

Megan Bodily, Texas A&M University

Amber R. Crowell, Associate Professor

California State University, Fresno, Department of Sociology

acrowell@csufresno.edu

Project Overview

- Funded through NSF Build and Broaden (B2) 3.0 (NSF #2222573)
- Goals
 - Develop new empirical findings and understandings on historical residential segregation using GIS and quantitative analysis
 - Create an open-access digital database of maps and resources
 - Build a network of faculty and student researchers across MSIs to collaborate and contribute
 - Develop teaching resources, courses, and workshops for student training and research opportunities
- Why?
 - Gives researchers the capability to map, analyze, and document historical and contemporary segregation patterns in communities using digitized historical census data, innovative new methods of segregation analysis, and geographic information systems (GIS) mapping.
 - Facilitates collaboration with researchers at other MSIs, who will contribute and use data and mapping resources archived on the project's website for teaching and research.
 - Student research and learning opportunities through open-access training and research.

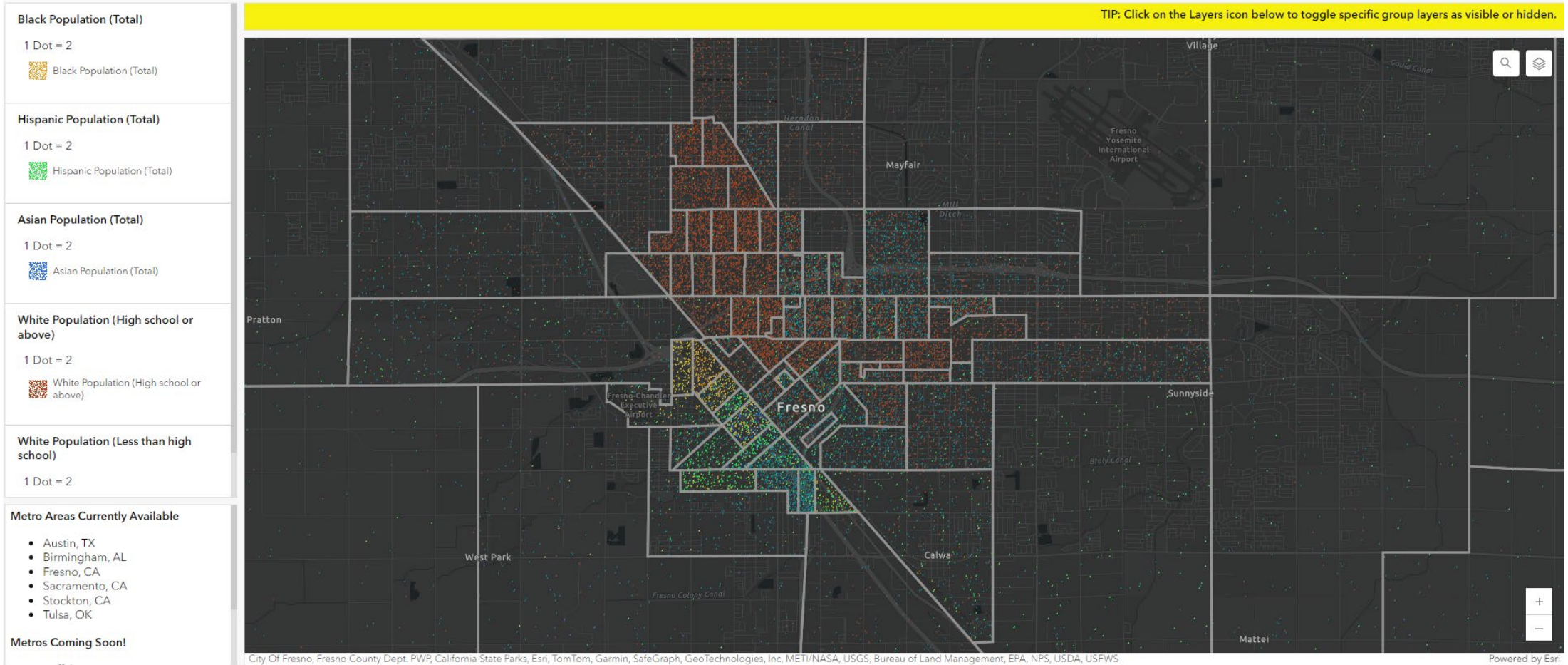
Activities

- In progress:
 - Generate digital boundary files (i.e., shapefiles) of enumeration districts within metropolitan areas in 1940 using open-source software QGIS and archival materials
 - Join shapefiles with 1940 census data to visualize demographic data across neighborhoods and identify residential segregation patterns
 - Research on locational attainment outcomes in 1940 across the metropolitan U.S.
- Now available:
 - The website! www.themarkfossettlab.org
 - Training materials for potential contributors and users
 - The living atlas, where new areas are being added as we go
 - Data and shapefiles that are ready to be shared

Results

The Mark Fossett Lab: Mapping the Origins of Urban Segregation Explore 1940 Census Data Across Neighborhoods

TIP: Click on the Layers icon below to toggle specific group layers as visible or hidden.



Lessons Learned

- Stay organized – very, very organized.
- Be prepared to do more administrative work than you expected. A stipend budgeted for your administrative staff is very helpful.
- Student training is essential.
- Document everything – procedure, changes, everything!
- For grant-writing: Take the “broader impact” aspect very seriously. Intellectual merit will not carry the weight alone.

Next Steps/Long-Term Plans

- Schedule and announce training workshops
- Explicate finding that socioeconomic status has inverse relationship with Black segregation in Southern metropolitan areas
- Prepare manuscripts for publication
- Student goal-setting
- Keep on mapping!

Summary

- Collaborative and open research is highly complementary with working within the CSU. Allows for:
 - Achievable goals
 - Capacity-building
 - Inclusiveness
 - Student learning
- This project was designed with these aspects to both be competitive within the Build and Broaden 3.0 program and support faculty research in the social sciences at a CSU.
- Design a project that thrives on collaboration with faculty, students, and the community.

Mapping the Origins of Urban Residential Segregation
through Open Resources and Collaboration

Questions?

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Next Steps/Closing Remarks

Dr. Elizabeth Soto,
Director of Research Operations, Department of Research
Office of the Chancellor

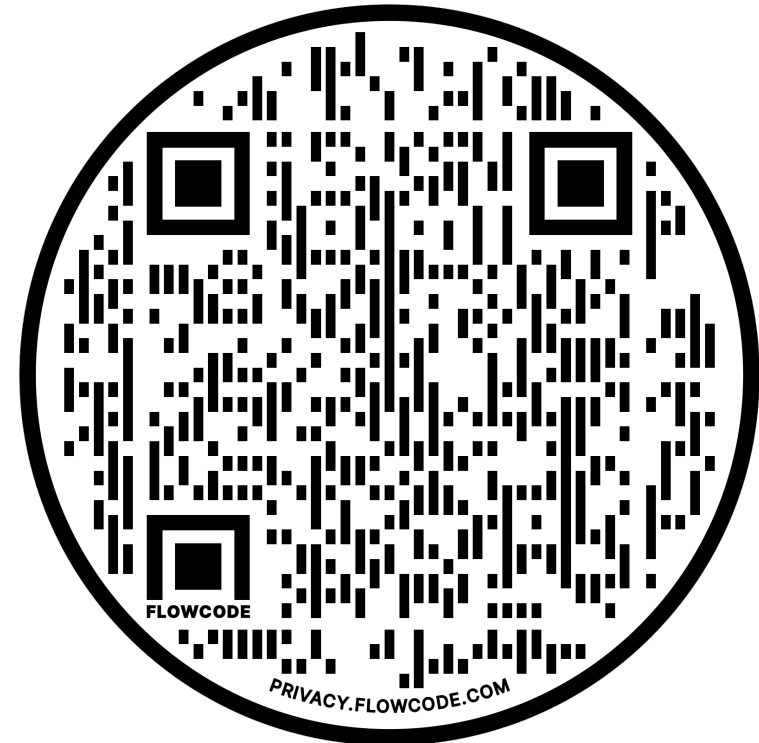


<https://www2.calstate.edu/impact-of-the-csu/research/stem-net>

Webcast Feedback Survey

Please take a few moments to tell us about your webcast experience.

Use the QR Scan Code to download it



Upcoming Events

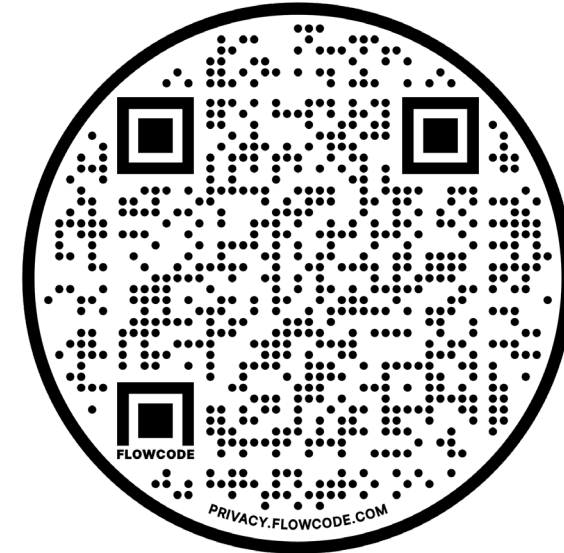
STEM-NET October Webcast

Topic: CSU USDA Grantees

Date: Friday, October 4, 2024

Time: 11:00 AM – 12:00 PM

Register Here



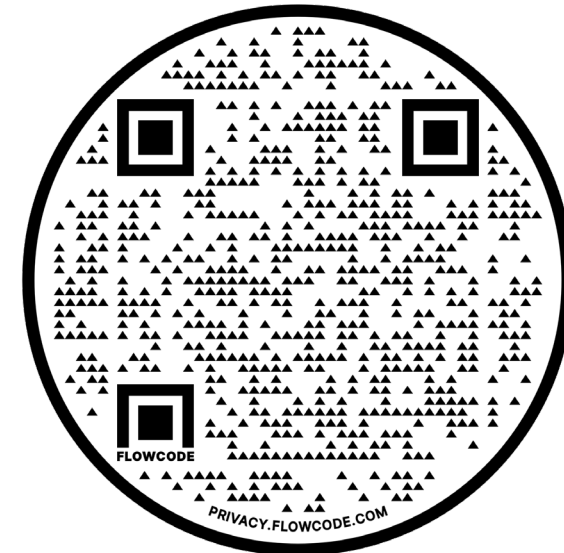
STEM-NET Student Summer Research Symposium

Topic: STEM-NET Student Summer Research Awardees

Date: Wednesday, October 30, 2024

Time: 11:00 A.M. – 12:15 P.M.

Register Here





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csustemnet@lists.calstate.edu



Begin a Conversation with Colleagues and Join our **Private CSU STEM-NET Facebook Group**

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For more information about STEM-NET visit our website:



THANK YOU FOR JOINING US TODAY!

