

Invasive Species: Understanding the Social Dimensions of Ecological Change

Diane J.E. Sturgeon, PhD (she/her)
Social Science Post-Doctoral Associate
Invasion Science Institute (ISI)
University of Florida IFAS



Who am I

- Social scientist by training with a focus on Human Dimensions
- Triple Gator

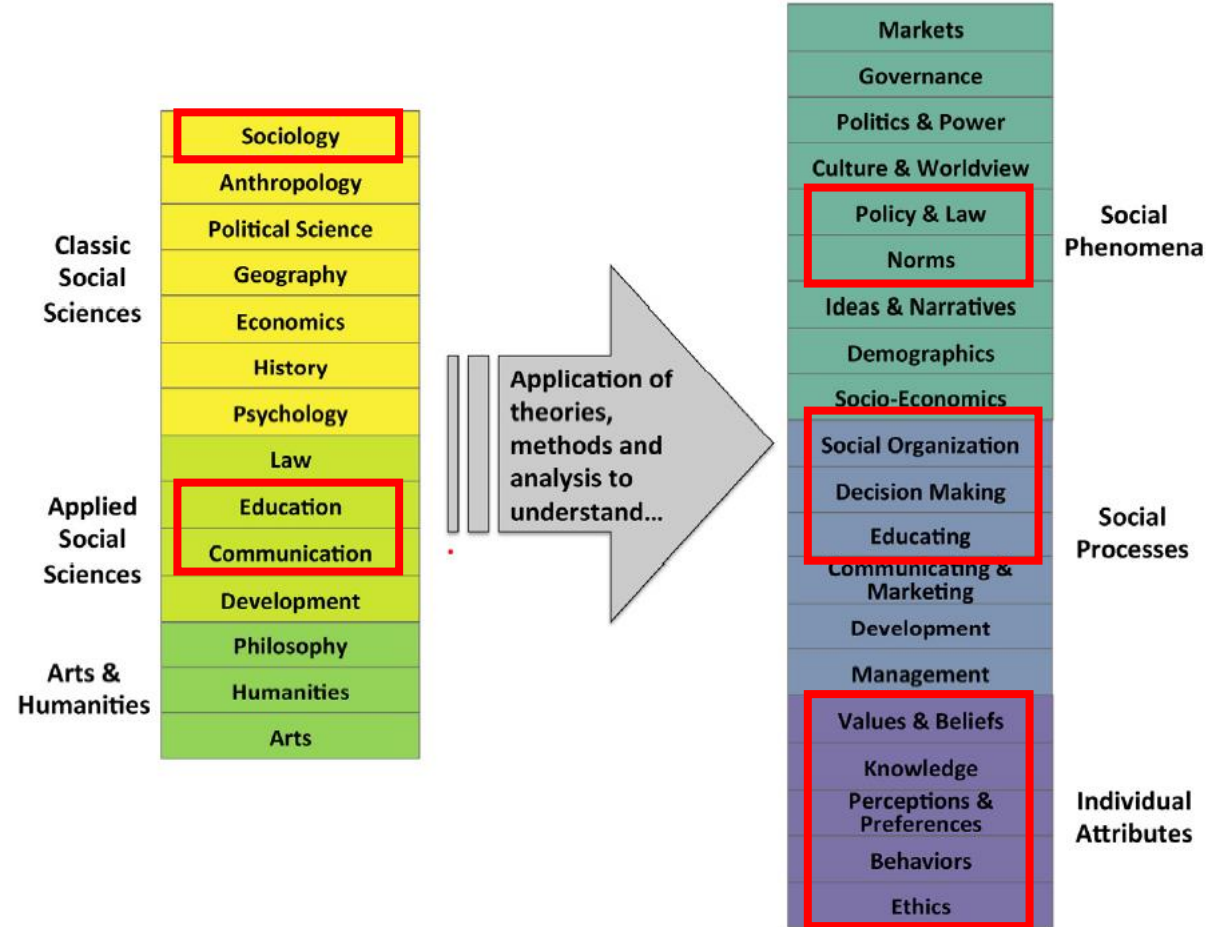


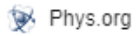
Fig. 1. The social sciences, humanities and related topics of study.

Please cite this article as: Bennett, N.J., et al., Conservation social science: Understanding and integrating human dimensions to improve conservation, *Biological Conservation* (2016), <http://dx.doi.org/10.1016/j.biocon.2016.10.006>

Type of Method	Examples
Qualitative	Interviews, focus groups, observations, text analysis, ethnographies, case studies, image analysis
Quantitative	Surveys, lab and field experiments, modeling, physiological evaluation, economic valuation, cost-benefit analysis
Participatory	Group facilitation, community-based research, arts-based methods
Planning and forward-thinking	Structured-decision making, economic modeling, scenario planning, back-casting
Evaluative	Monitoring and evaluation (randomized control trials, realistic evaluation), policy analysis, argument analysis, statutory interpretation
Spatial	Geographic information systems (GIS), historical geographic information systems (HGIS)
Historical	Archival research, landscape histories, oral histories
Meta-analytical	Meta-analysis, systematic reviews, qualitative comparative analysis

Adapted from Bennett, N. J., Roth, R., Klain, S. C., Chan, K., Christie, P., Clark, D. A., ... & Wyborn, C. (2017). Conservation social science: Understanding and integrating human dimensions to improve conservation. *Biological conservation*, 205, 93-108.

The Social Side of Invasion Science



Phys.org

Invasive species are animals, too: Considering a humane approach

Invasive alien species are animals that may pose a threat to biodiversity, but it's time to deal with that threat in a more ethical way.



Washington Post

In Florida Keys, a controversial project releases genetically modified mosquitoes

MIAMI — A controversial project to release genetically modified mosquitoes in the Florida Keys to battle the disease-carrying *Aedes aegypti*...

May 4, 2021



The Palm Beach Post

Python pie, anyone? Can we solve Florida's invasive animals issue by eating them?

The U.S. Fish and Wildlife Service recently released a list of invasive species in Florida encouraging people to eat some of these animals to...

16 hours ago



National Geographic

These invasive pests are tormenting Florida's manatees

Armored catfish are driving manatees out of their warm-water refuges, putting their health at risk. Here's why it's happening—and what...

Jan 28, 2025



Journal of Applied Ecology 2017, **54**, 351–357

doi: 10.1111/1365-2664.12817

POLICY DIRECTION

Invasive species management will benefit from social impact assessment

Sarah L. Crowley¹, Steve Hinchliffe² and Robbie A. McDonald^{1*}

Conservation Biology

CONTRIBUTED PAPERS

Consensus and controversy in the discipline of invasion science

Ross T. Shackleton^{1,2,3} | Giovanni Vimercati⁴ | Anna F. Probert⁴ | Sven Bacher⁴ | Christian A. Kull³ | Ana Novoa⁵

RESEARCH ARTICLE

PEOPLE NATURE
BRITISH ECOLOGICAL SOCIETY

Unravelling how collaboration impacts success of invasive species management

Nisansala Abeyasinghe^{1,2} | Christopher J. O'Bryan^{1,2} | Angela M. Guerrero³ | Jonathan R. Rhodes^{1,2} | Eve McDonald-Madden^{1,2}

REVIEWS REVIEWS REVIEWS

Conflict in invasive species management

Sarah L. Crowley¹, Steve Hinchliffe², and Robbie A. McDonald^{1*}

Socio-economic impact classification of alien taxa (SEICAT)

Sven Bacher^{1,2}  | Tim M. Blackburn^{3,4,5} | Franz Essl⁶ | Piero Genovesi⁷ |
 Jaakko Heikkilä⁸ | Jonathan M. Jeschke^{9,10,11} | Glyn Jones¹² | Reuben Keller¹³ |
 Marc Kenis¹⁴ | Christoph Kueffer^{2,15} | Angeliki F. Martinou¹⁶ | Wolfgang Nentwig¹⁷ |
 Jan Pergl¹⁸ | Petr Pyšek^{18,19} | Wolfgang Rabitsch²⁰ | David M. Richardson² |
 Helen E. Roy²¹ | Wolf-Christian Saul^{9,10,11} | Riccardo Scalera²² | Montserrat Vilà²³ |
 John R. U. Wilson^{2,24} | Sabrina Kumschick^{2,24}

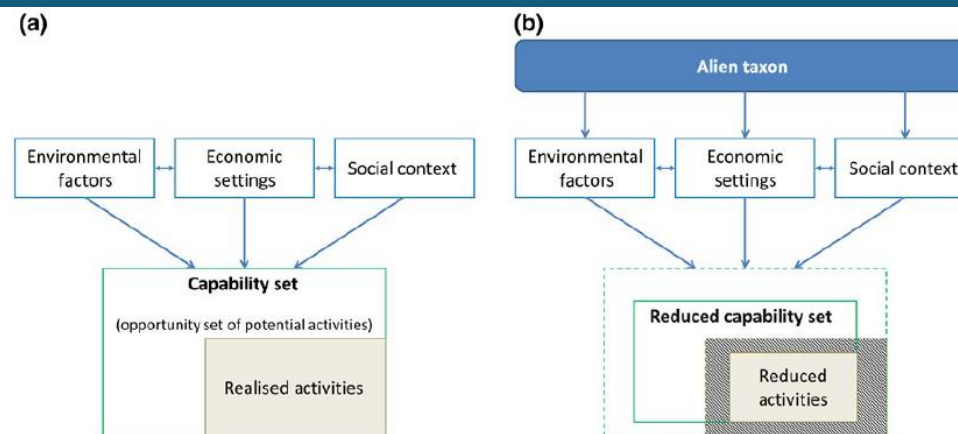


FIGURE 1 (a) A person's capability set depends on environmental factors, economic settings (goods & services), and the social context. From this set, people select the activities they want to achieve (realised activities). (b) Alien taxa can reduce people's opportunities via changes in environmental factors, economic settings or the social context. Socio-Economic Impact Classification for Alien Taxa (SEICAT) defines negative impacts as losses in realised activities attributable to an alien taxon (black hatched area)



My Projects with the Invasion Science Institute



Invasive Freshwater Fish Commodity Chain Interviews

Mike Sipos

Diane JE Sturgeon

Jordy Chen

Claire Collier

Research Goals



Learn the current usage of invasive freshwater fish in the seafood commodity chain in Florida.



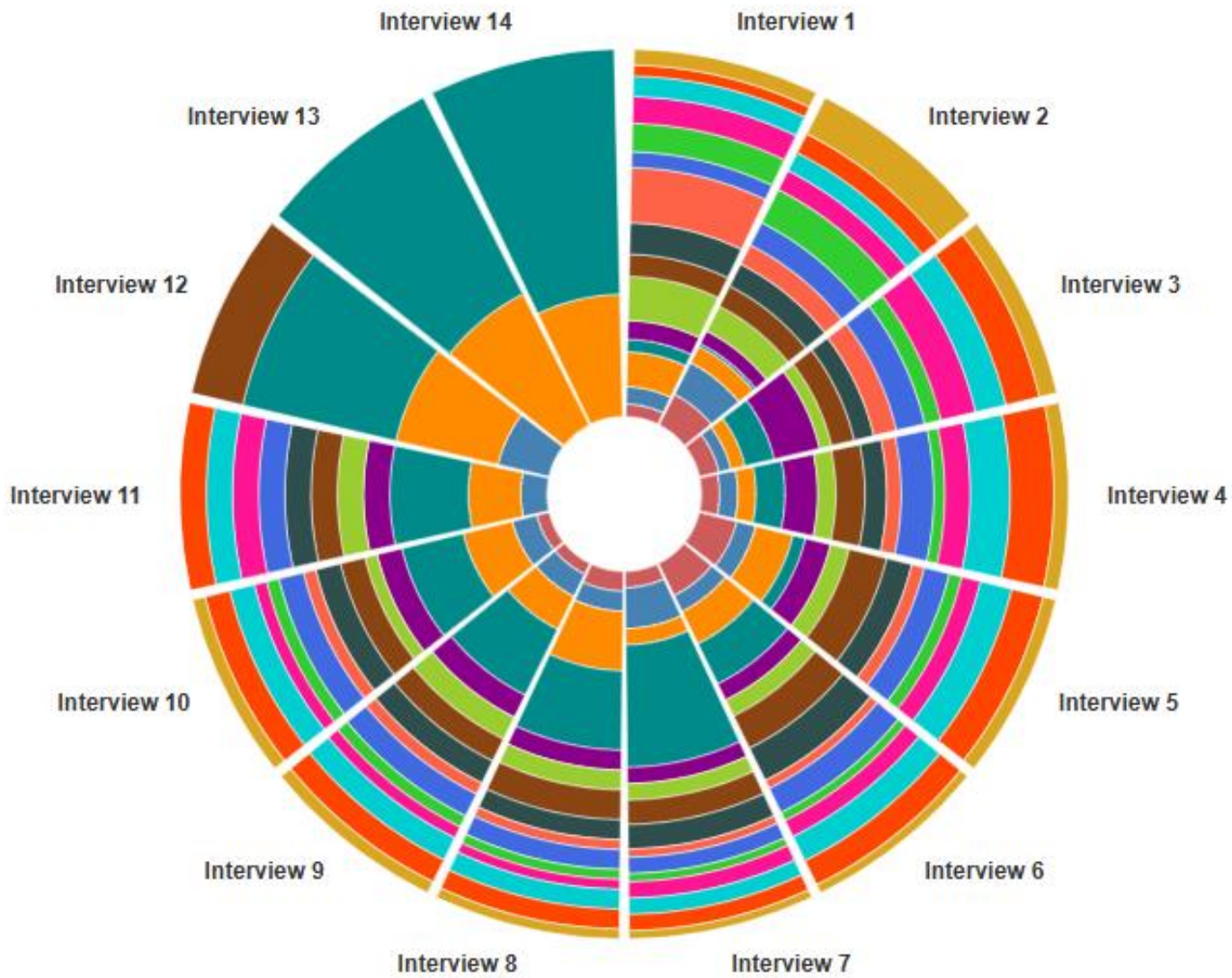
Explore the knowledge and information gaps hindering access to eating and fishing underutilized seafood, especially invasive fish.




Understand what are the barriers at each level of the commodity chain (including anglers, seafood processors, seafood distributors/wholesalers, fish markets, and the consumer) to incorporating invasive fish into the Florida seafood commodity chain.

Methods

- Total of 14 interviews (7 hours and 4 minute)
- Interviewees included: processors, distributors, markets
- ATLAS.ti qualitative analysis software
- AI* generated codes
- Human-check and clean AI generated codes



- Angler
- Consumer Awareness/Education
- Consumer Preference
- Market
- Profitability
- Availability
- Consumer Cost Barrier
- Cultural Impact
- Number of Anglers
- Quality (Perceived or Actual)
- Commodity Chain Cost Barrier
- Consumer Perceptions
- Government
- Processing
- Wholesalers



We're All in This Together: Stakeholder Engagement and Involvement in Mosquito Control

Diane JE Sturgeon, Whitney Qualls,
Vindhya Aryaprema, Joseph Diclaro,
Kai Blore, Olivia Sypes, Kody Fisher,
Chao Chen, Daniel Hahn




The Goal

- Assist Anastasia Mosquito Control District (AMCD) in St. Augustine, FL with their proactive efforts to engage the community
- Goal to promote understanding of innovative mosquito control technologies
 - Specifically Sterilized Insect Technique (SIT)


The How – Early Stakeholder Engagement


Research Article

Oxitec and MosquitoMate in the United States: lessons for the future of gene drive mosquito control

Cynthia E. Schairer, James Najera, Anthony A. James, Omar S. Akbari & Cinnamon S. Bloss 

Pages 365-376 | Published online: 27 Jul 2021

 Cite this article

 <https://doi.org/10.1080/20477724.2021.1919378>



*“As gene-drive mosquito control products develop, both federal and local agencies will **find their legitimacy tested without a better procedure for transparently integrating public input.**”*

What we are doing



Mosquito Control: Protecting Our Community's Health

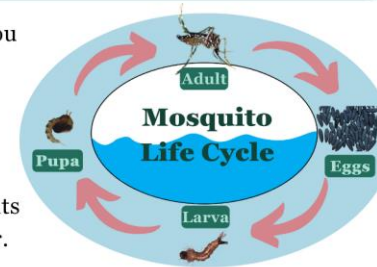
We at the Anastasia Mosquito Control District are dedicated to protecting the health and well-being of our community



Mosquito bites don't just itch, they can spread diseases to people.

Mosquitoes need water to breed. At home, you can prevent mosquito breeding by removing standing water.

Some mosquitoes aren't so easy. The yellow fever mosquito has developed resistance to many chemical pesticides, and its eggs can survive many months without water.



Let's **SIT** on these mosquitoes!

The Sterile Insect Technique (SIT) is a safe, environmentally friendly control method *used for over 7 decades*



FAQS

Does SIT pose any threat to humans?

Fun fact: Only female mosquitoes bite, so SIT does not increase the number of biting mosquitoes because we only release males that do not bite.

Does SIT on the yellow fever mosquito pose any threat to the environment?

- Because SIT specifically targets yellow fever mosquitoes, there is no threat to non-target organisms (for example, bees).
- Mosquitoes we release are not genetically modified, and they come from St. Johns County, so nothing new or harmful is introduced.

I have more questions, who can I talk to?

Please get in touch with us at Anastasia Mosquito Control District by email at SIT@amedfl.org or by phone at (904) 471-3107 with any questions!

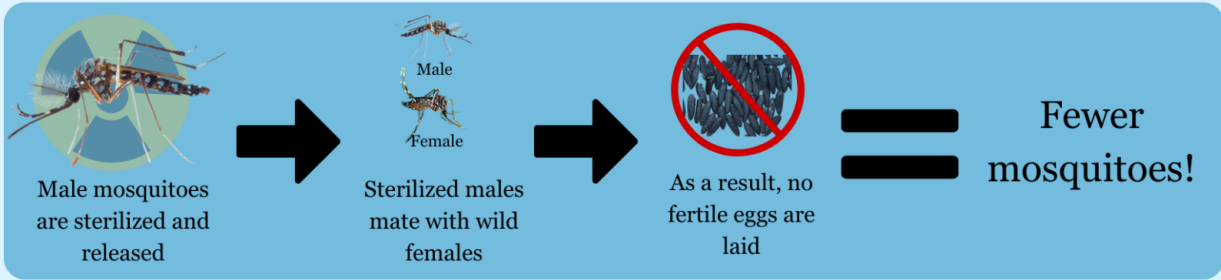


We need your opinions on mosquito control!



Scan for survey

We at Anastasia Mosquito Control District of St. Johns County will be using the **Sterile Insect Technique (SIT)** to reduce your local mosquito population and protect the health and well-being of our community, *and your feedback is important to us!*

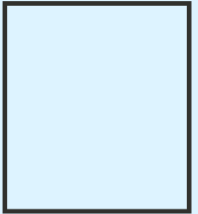


If you have any questions about the process, please get in touch with us by email at SIT@amcdf.org or by phone at (904) 471-3107

Mosquitoes we release are not genetically modified and come from St. Johns County, so nothing new or harmful is introduced.



Scan the QR code to tell us your opinions on the use of the Sterile Insect Technique (SIT) by the Anastasia Mosquito Control District.





(904) 471-3107



SIT@amcdf.org

Your Opinions on Mosquito Control in St. Johns County



We, the Anastasia Mosquito Control District (AMCD), are conducting a survey to understand your opinions on mosquito control. Please take a few minutes to complete this survey. Your responses are anonymous and will help improve our mosquito control efforts in St. Johns County.

Informed Consent

Time Required: It will take about 5 to 10 minutes to participate in the questionnaire, which involves 15 questions.

Research Benefits: There are no direct benefits to you for being in this study. More broadly, this study may help AMCD and researchers learn more about public opinions on mosquito management and may help current and future residents of St. Johns County.

Research Risks: There are no more than minimal risks to your participation.

Statement of Confidentiality: Your participation in this research is confidential. The researchers will not share your name or other identifiable information about you.

Who to contact if you have questions: Please contact Diane J.E. Sturgeon at djesturgeon@ufl.edu with questions or concerns about this study.

Voluntary Participation: Your decision to be in this research is voluntary. You can stop at any time. If you choose not to take part, this will have no effect on you or your relationships with the University of Florida. If you have any questions about your rights as a research subject, you can phone the Institutional Review Board at (352) 273-9600.

Participation in the research implies that you have read the information in this form and consent to take part in the research.

1. How familiar were you with the **Anastasia Mosquito Control District (AMCD)** before this survey? *Please circle one number.*

- 1 Not familiar at all
- 2 Slightly familiar
- 3 Moderately familiar
- 4 Very familiar
- 5 Extremely familiar

2. How often do you take measures to prevent mosquito breeding around your home? *Please circle one number.*

- 1 Never
- 2 Rarely
- 3 Sometimes
- 4 Often

3. To the best of your knowledge, which gender of mosquito bites people? *Please circle one number.*

- 1 Only males
- 2 Only females
- 3 Both males and females

4. How **familiar** are you with the following mosquito control methods? *Please circle your responses.*

	Not at all	Slightly	Moderately	Highly	Extremely
Sterile Insect Technique (SIT)	1	2	3	4	5
Genetically modified mosquitoes	1	2	3	4	5
Pesticides	1	2	3	4	5
Removing standing water in your yard	1	2	3	4	5

5. Have you seen the attached educational handout about the Sterile Insect Technique (SIT) before this survey? *Please circle one number.*

- 1 Yes
- 2 No (*Please skip to question 7*)

6. If you have seen the handout, where have you seen it?

7. Based on what you know about the following methods, do you **support or oppose the implementation** of these mosquito control efforts in your community? *Please circle your responses.*

	Strongly oppose	Oppose	Neither oppose nor support	Support	Strongly support
Sterile Insect Technique (SIT)	1	2	3	4	5
Genetically modified mosquitoes	1	2	3	4	5
Pesticides	1	2	3	4	5
Removing standing water in your yard	1	2	3	4	5

8. In a few words, why did you select the choice you made for the **Sterile Insect Technique (SIT)**?

Killer News

Identifying Framing in Invasion Science Media

Diane J.E. Sturgeon*, PhD

Invasion Science Institute (ISI)

University of Florida

Andrew Holmes, MSc

Independent Researcher

Paul Evans, MSc

Invasion Science Institute (ISI)

University of Florida

Invasive Species Can Wreak Havoc. Case in Point: the Everglades.

Here's what experts say can be done about it

By [Katarina Zimmer](#)

July 21, 2024



Photo by JC Shanrock/Getty Images

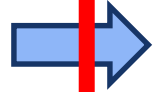
[This story first published in Knowable Magazine.](#)

What invasion science topics are represented in U.S. media at the regional and national level?

How are those topics framed?

Framing Theory

Frame-building



Frame-setting



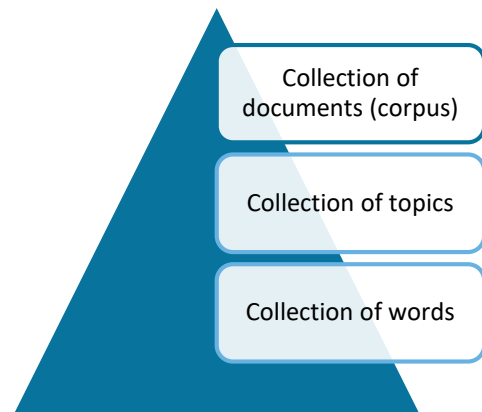
Consequences
of framing



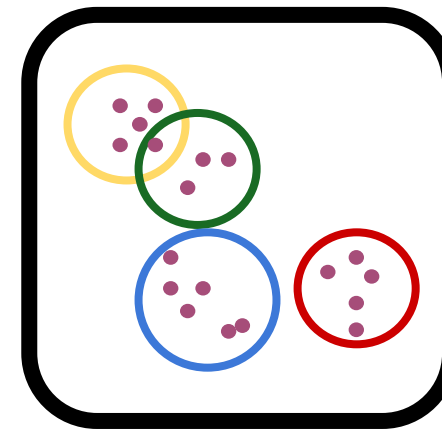
Process model of framing, adapted from De Vreese (2005)

Methods

- Nexis Uni database
- United States articles from 2003 through 2023
- 3,560 articles
- Latent Dirichlet Allocation (LDA) Topic Modeling



Identification of topics



Similarity across topics

Sentiment Analysis

Killer News

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Photo by JC Shanrock/Getty Images

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Helpful News

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OPINION | Guest Column

Tina McIntyre

Florida is ground zero for invasive species, but you can help | Column

Plant native species and keep invasive species in check.



The rose peppertree (formerly Brazilian peppertree) is a highly invasive plant that has berries that resemble holly. The plant was brought to Florida in the mid 1800s as an ornamental.

Published Jan. 5, 2024

Words become numbers...

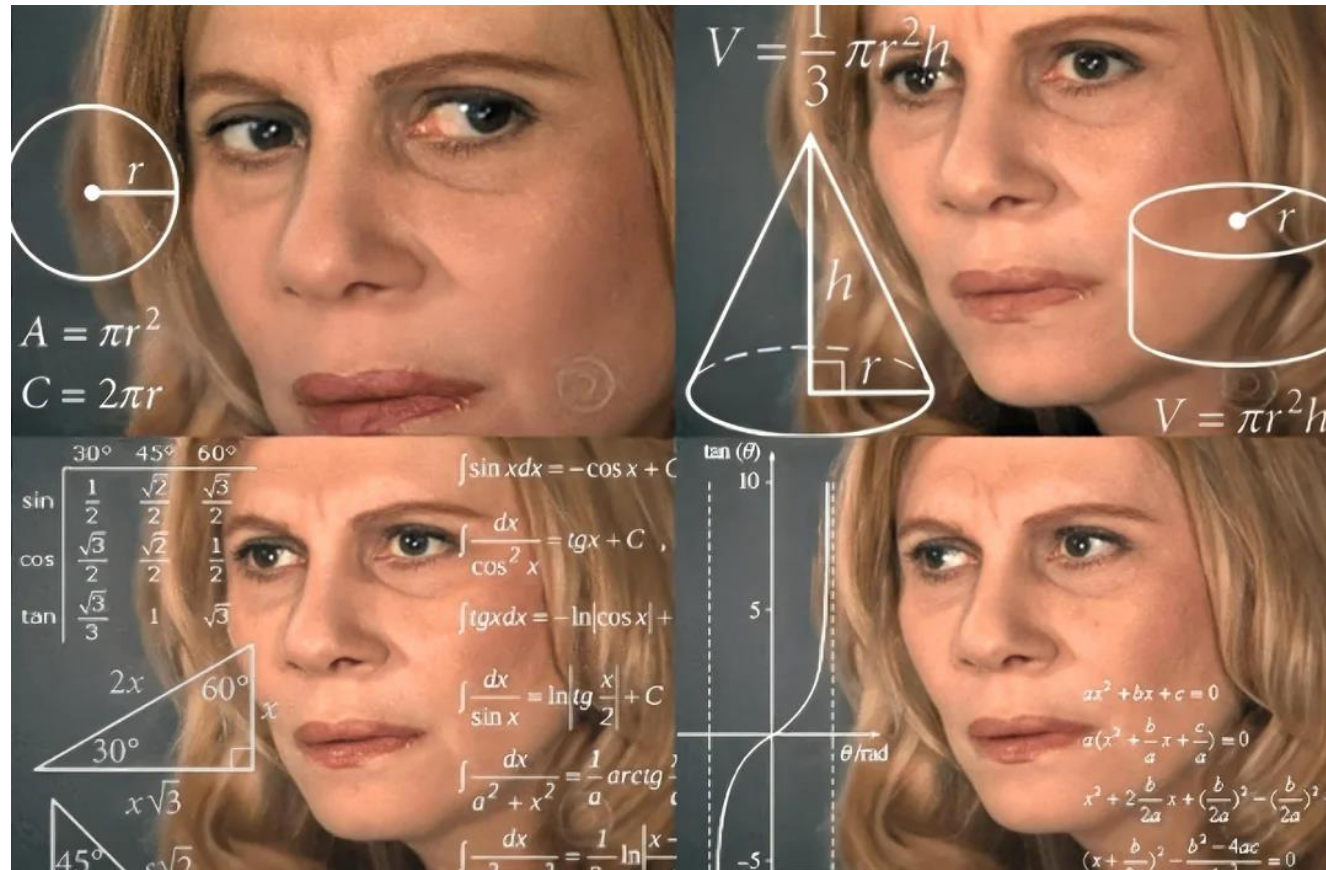
Attack = -1

Destroy = -3

Protect = 1

Attract = 1

Burden = -2



Benefit = 2

Lag = -1

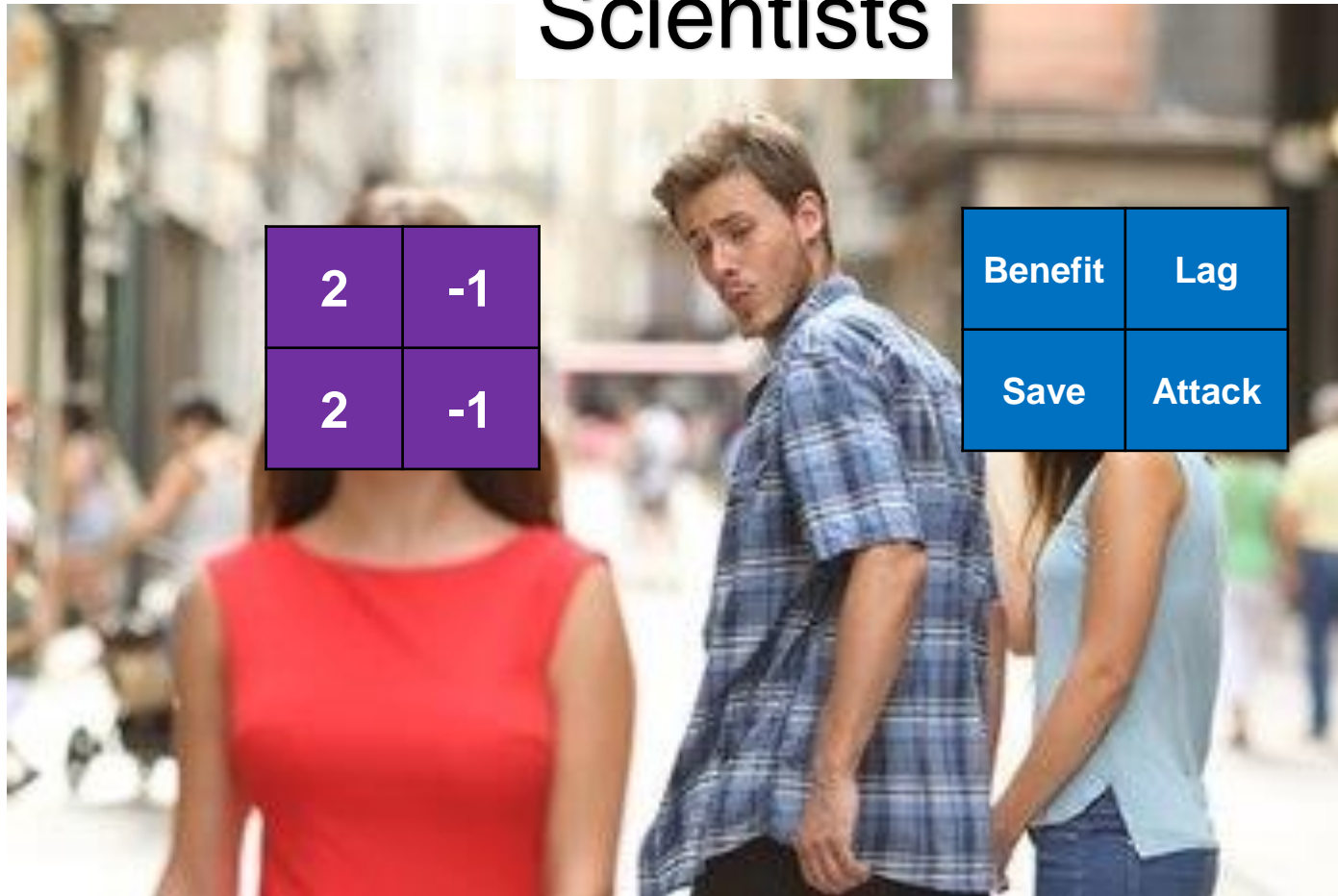
Save = 2

Beautiful = 3

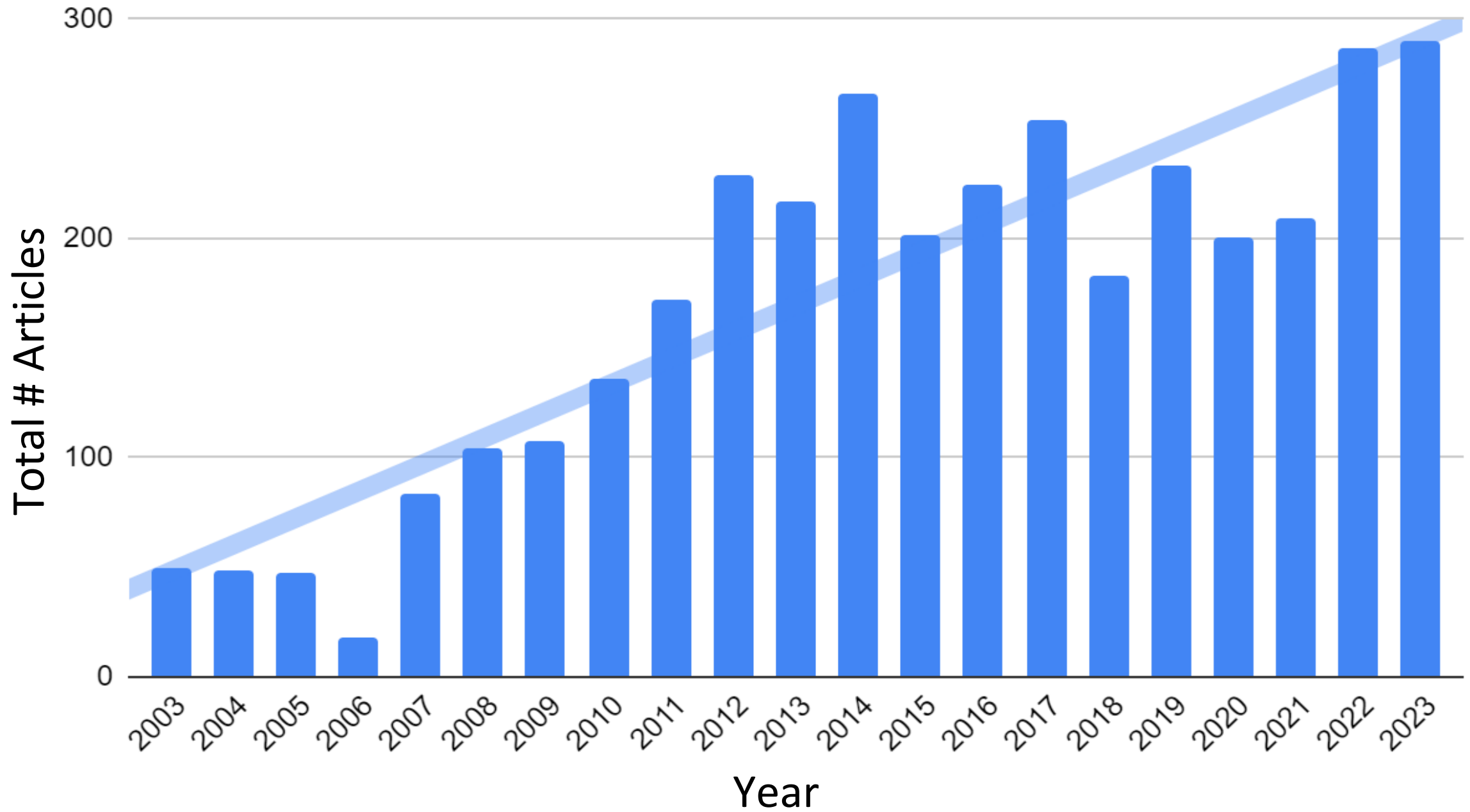
Skeptical = -2

Numbers become data

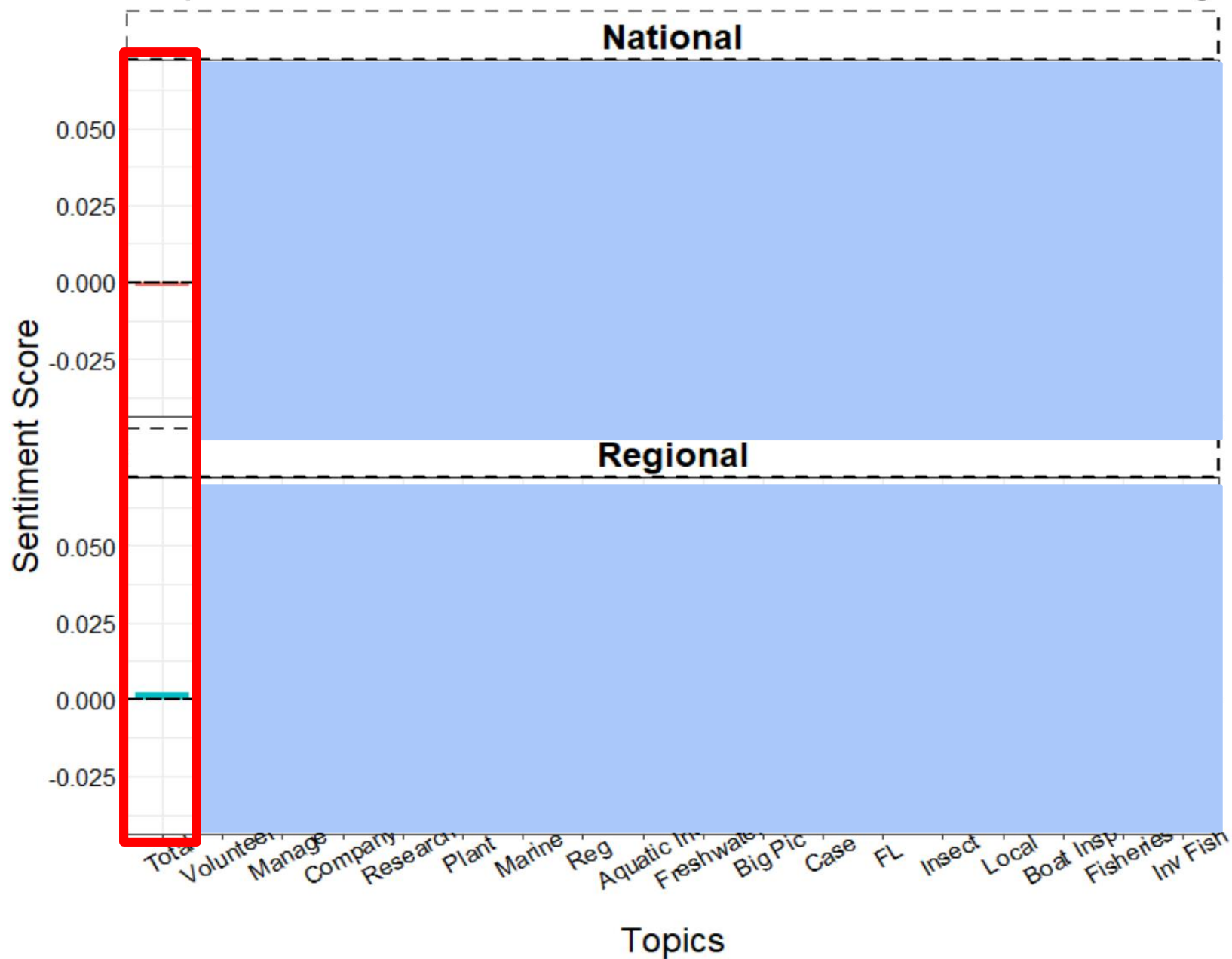
Scientists



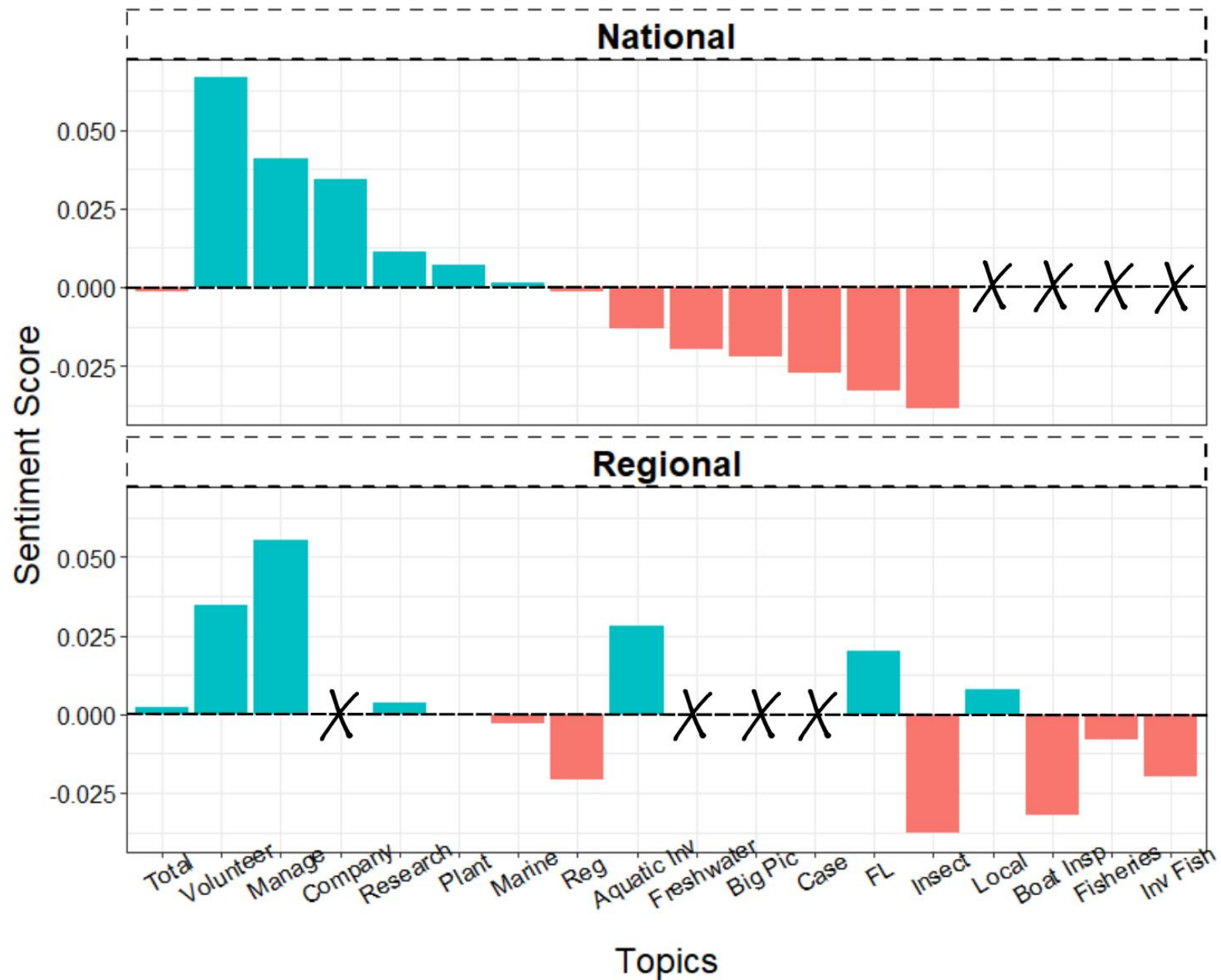
Results



Invasive species news ('03 thru '23) sentiment analysis

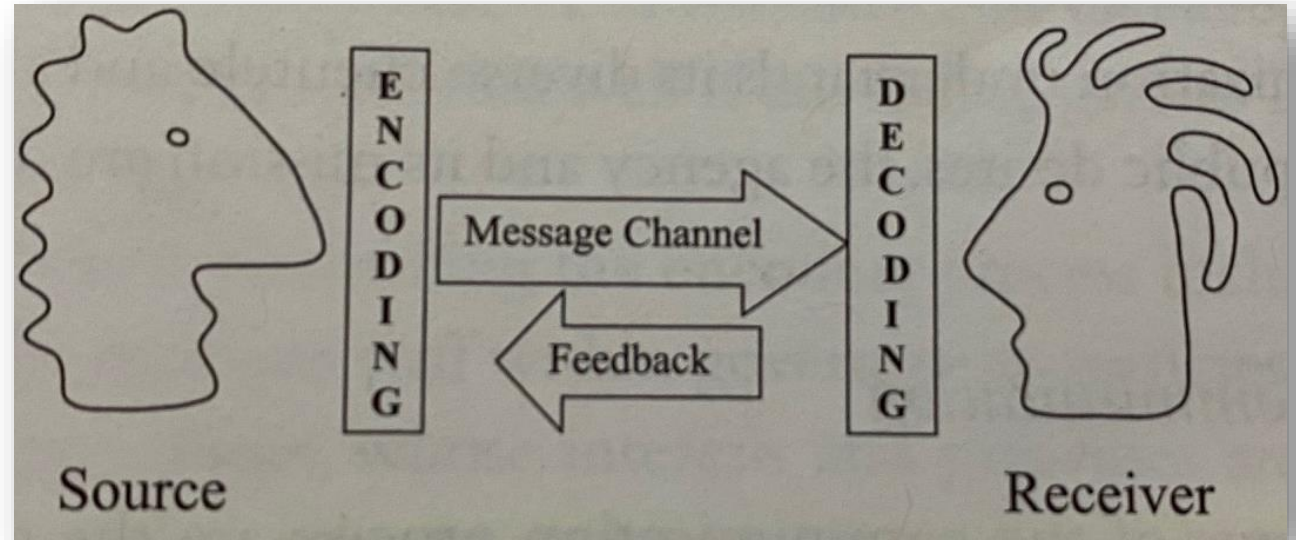


Invasive species news ('03 thru '23) sentiment analysis



Okay... Why do we care?

Communication



Jacobson, S. K. (2009). Communication skills for conservation professionals (Second Edition). Island Press, Washington, DC.

Broken down into 4 elements:

1. Encoding: Selection of words/ideas to represent message
2. Message channel: Use of medium to distribute message
3. Decoding: Translation of message by receiver
4. Feedback: Insight if message was received as intended

Requires **BOTH** sending a message and having the message **UNDERSTOOD**

The Power of Communication

Hope Theory

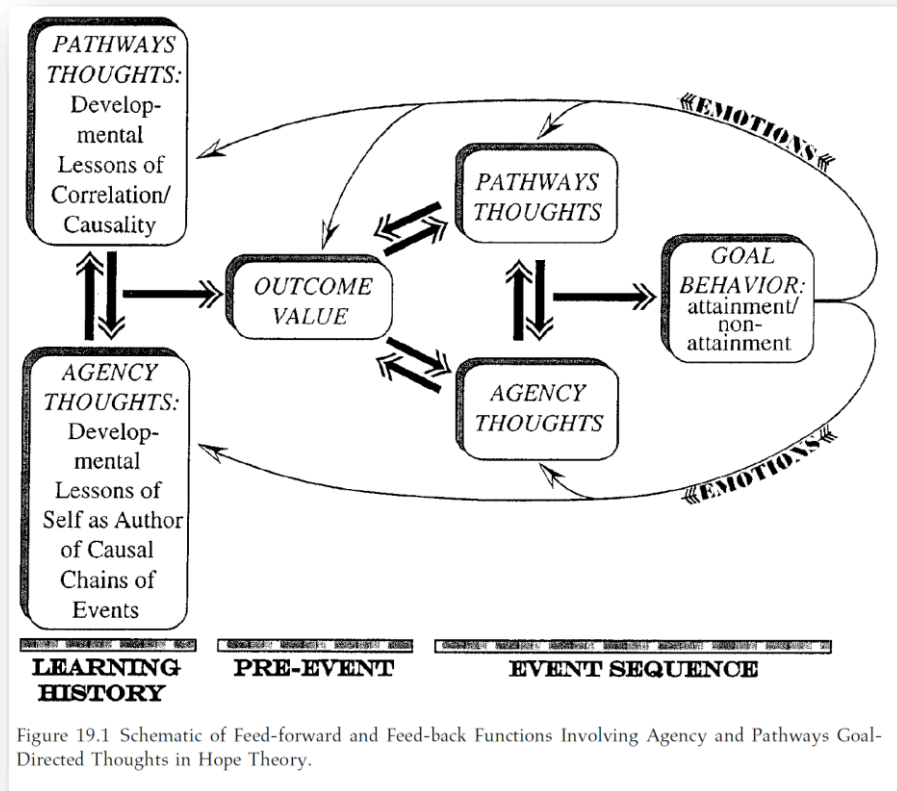
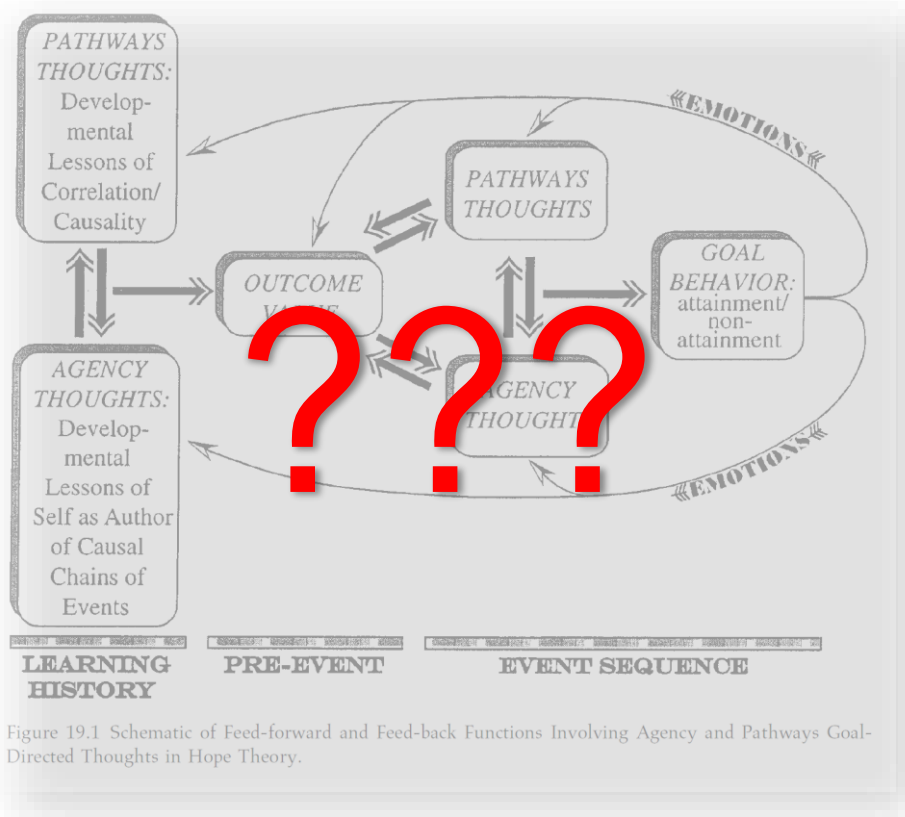


Figure 19.1 Schematic of Feed-forward and Feed-back Functions Involving Agency and Pathways Goal-Directed Thoughts in Hope Theory.

The Power of Communication

Hope Theory



1) Doom-and-gloom can elicit apathy

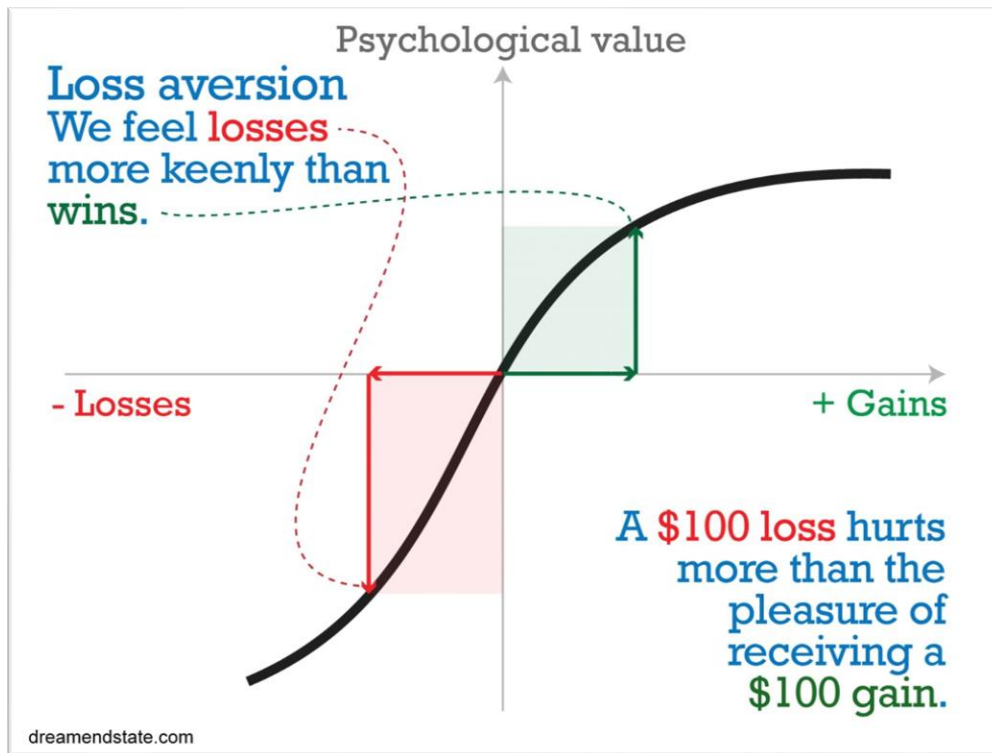
2) Hope in messaging promotes belief in ability to make change

Figure 19.1 Schematic of Feed-forward and Feed-back Functions Involving Agency and Pathways Goal-Directed Thoughts in Hope Theory.



Contradictions, contradictions everywhere

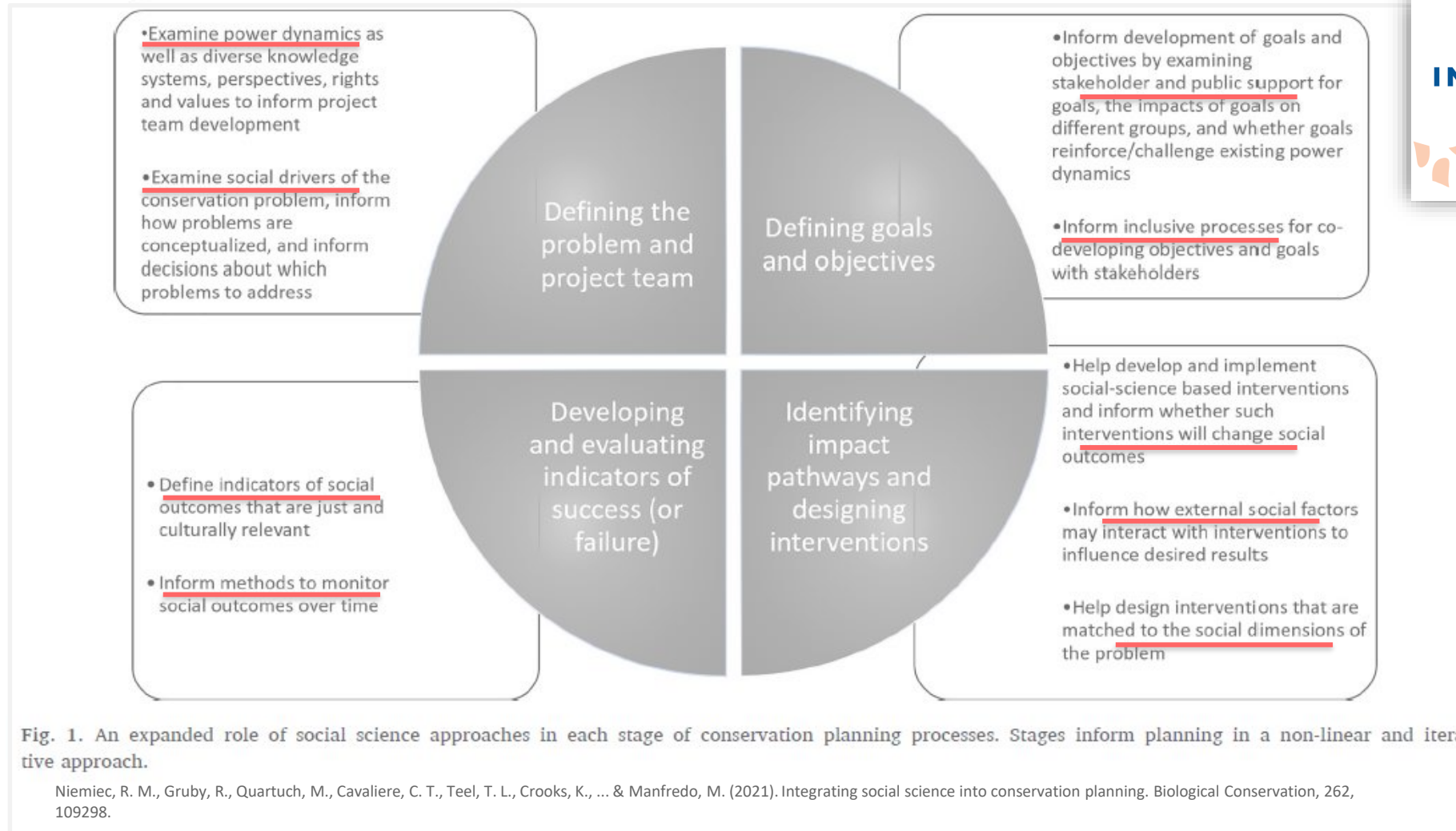
Prospect Theory



"We must protect coral reefs because they provide essential services such as marine biodiversity, protecting coastlines from erosion, and sustaining fisheries that millions of people rely on for food and income."

"If we do not act now to protect coral reefs, we risk losing countless species and the vital services reefs provide, which would have severe economic, ecological and human well-being impacts on coastal communities worldwide."

Still wondering when to call a social scientist?



Questions? Follow-up with me @ djesturgeon@ufl.edu or scan