



Understanding angler behavior in the context of social-ecological systems

Elizabeth Golebie and Carena van Riper

Great Lakes Panel on Aquatic Nuisance Species

Virtual Meeting

October 27th, 2021

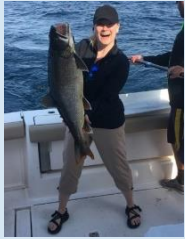


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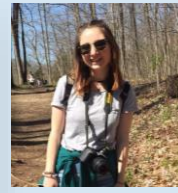
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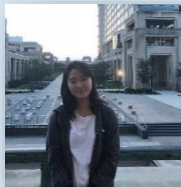


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Funding



United States Department of Agriculture
National Institute of Food and Agriculture





- **Unintentional spread of AIS by recreational anglers and boaters is of concern**
 - Research can identify ways to change behavior and minimize risk of AIS transport
- **Environmental social science questions are rarely asked in the biological invasions literature**
 - Biology and ecology (85%), social sciences (13%), interdisciplinary (2.9%) (Golebie et al. in prep)
- **Angler behavior is at the heart of important research questions**



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Understanding the multi-dimensional structure of pro-environmental behavior



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- **Environmental social sciences have largely focused on factors like knowledge, beliefs, and norms**
 - Accessible for managers given the training of most agency personnel
 - Knowledge-action gap is problematic
- **Short-term factors are informative but need to be complemented by “long-term” drivers of behavior**
 - Useful for sustaining communication strategies that enable anglers to act more consistently on their values and worldviews
 - Dubbed “psychological factors” given the focus on individual decisions

Biol Invasions (2017) 19:2059–2074
DOI 10.1007/s10530-017-1418-0



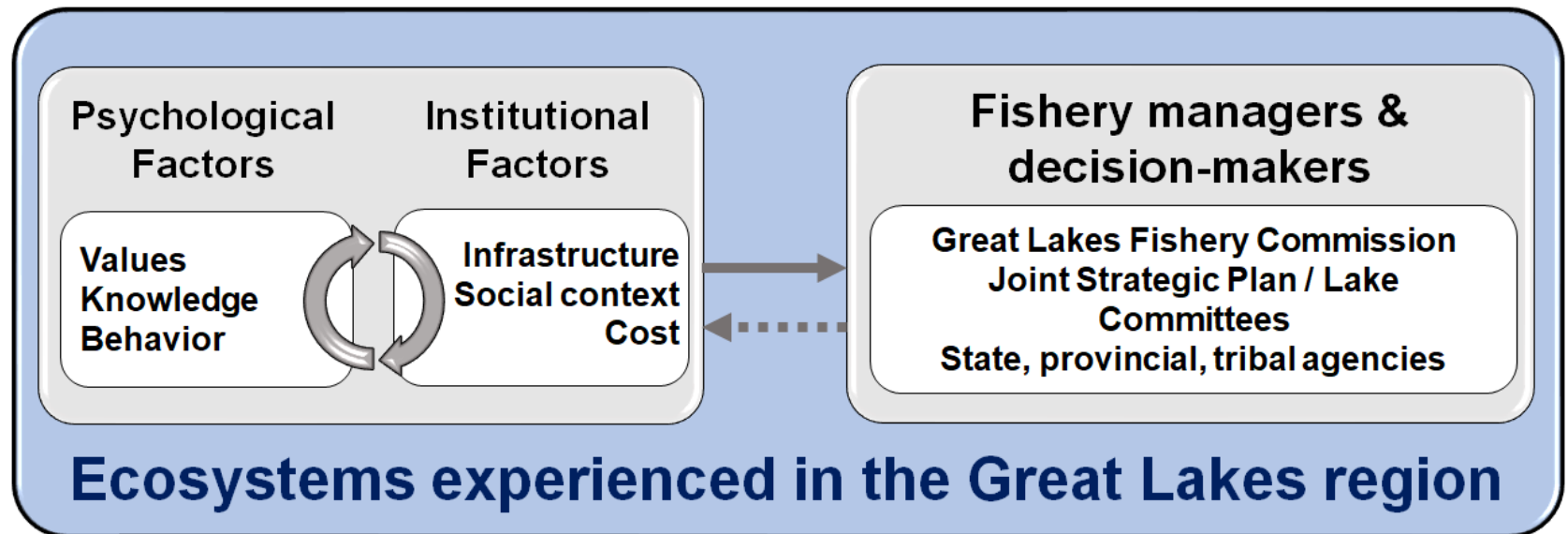
ORIGINAL PAPER

Connecting human–nature relationships to environmental behaviors that minimize the spread of aquatic invasive species

Catherine Kemp · Carena J. van Riper  · Lama BouFajreldin · William P. Stewart · Jarrod Scheunemann · Riyan J. G. van den Born



- **Effective management of AIS requires evidence from interdisciplinary research that interfaces with fishery decision-making**
 - Psychological factors span short- and long-term drivers
 - Institutional factors are also important and factored into research



van Riper, Stedman & Suski. 2019. *GLFC Technical Report*.



Study purpose and questions

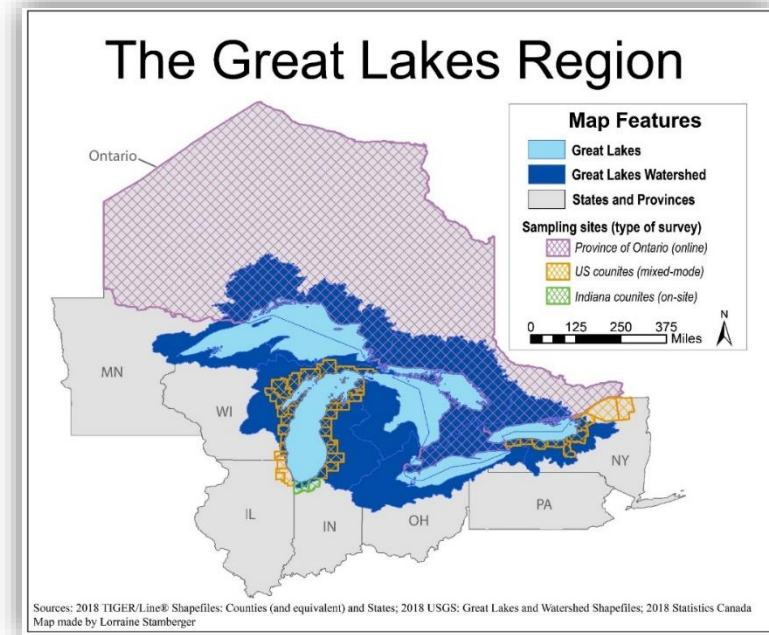


Understand factors affecting angler behavior to help prioritize management decisions about aquatic invasive species in the Great Lakes region

- What are the relationships between values and risk perceptions among Great Lakes anglers?
- What are the relationships between risk perceptions and reported behavior related to the spread of AIS for Great Lakes anglers?
- How do the relationships among values, risk perceptions, and reported behavior vary by fishing site within the Great Lakes?



- **Mailback & online survey in US**
 - License-holding anglers in Illinois, New York, Michigan, and Wisconsin counties adjacent to Lake Michigan or Lake Ontario
 - n=1,120; 27% response rate
- **On-site survey in IN**
 - Anglers contacted at boat ramps along Indiana shoreline of Lake Michigan
 - n=60; 17% response rate
- **Online survey in CA**
 - Anglers from the Canadian province of Ontario using “Anglers Atlas”
 - n=801; 12% response rate



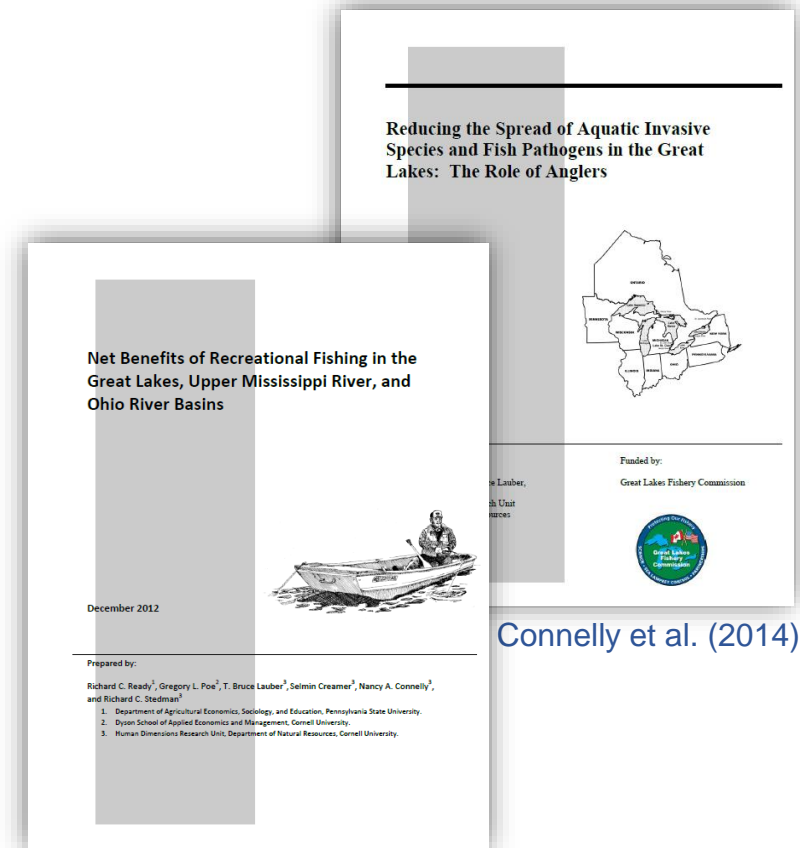
Study area for mixed mode survey administered June-Aug 2019

• Survey development

- Questions drawn from past research, tailored to context, and tested for reliability & validity
- Pilot testing conducted via focus group (n=6), and online with AFS members from Illinois (n=45) and New York (n=76)

• Non-response bias assessed

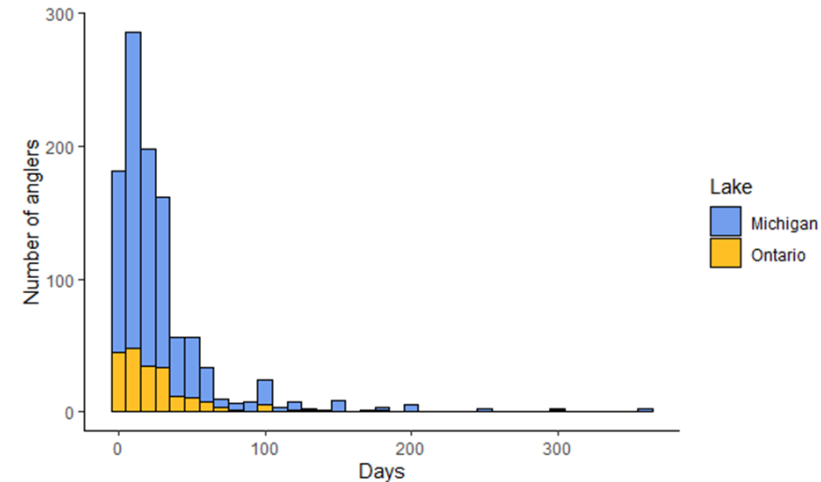
- No significant differences between our US sample and previous research (Connelly et al. 2014; Ready et al. 2012)
- Our CA sample was more experienced & included more males but similar across license types (OMNRF 2010, 2017)



Ready et al. (2012)

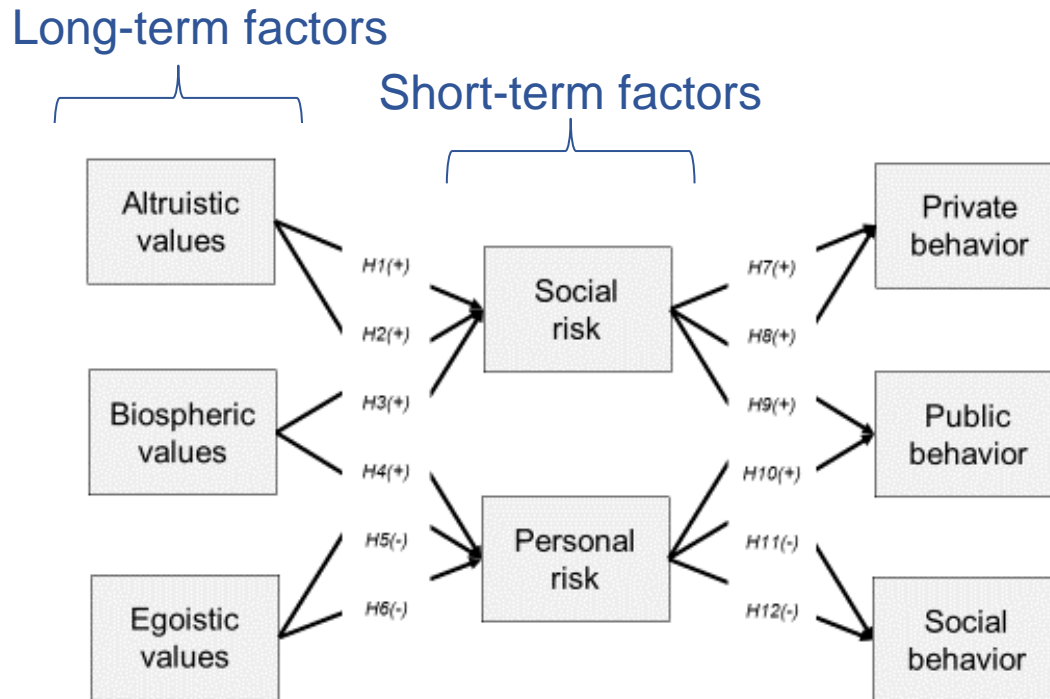
Connelly et al. (2014)

- **Fishing participation in 2018**
 - Average number of days fished was high (M=28.68) and right-skewed
 - Average years of fishing experience had a distribution closer to normal (M=40.49)
 - Average reported skill was 3.72 out of 5
- **Species targeted by anglers**
 - Most common of 21 target species: walleye, smallmouth bass, and largemouth bass
 - PCA sorted anglers into subgroups
 - 1) Salmon / trout (20%)
 - 2) Walleye / bass / pike / perch (50%)
 - 3) Panfish & other species (30%)

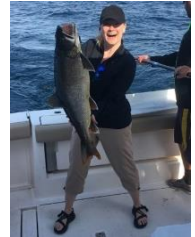


I Short & long-term factors affect behavior

- Survey data used to understand how “long-term” (values) and “short-term” (risk perceptions) factors influenced behavior



Golebie, van Riper, Stedman & Suski
(in press). *NAJFM*.



Carena
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Cory
Suski



Risk and values explain angler behavior



- **Engagement in reported AIS-prevention behavior was low**
 - Private behavior (e.g., washing boats) occurred “rarely” to “sometimes” whereas public behavior (e.g., participating in policy processes) occurred “never” to “rarely”
- **Personal risk perceptions directly predicted behavior and were lower than social risks**
 - Impacts on individual fishing experiences rather than threats to the Great Lakes fishery were more likely to resonate for the pooled sample
- **Risk perceptions were rooted in ‘long-term’ individual values**
 - Environmental (biospheric) values were strongest drivers of risk perceptions

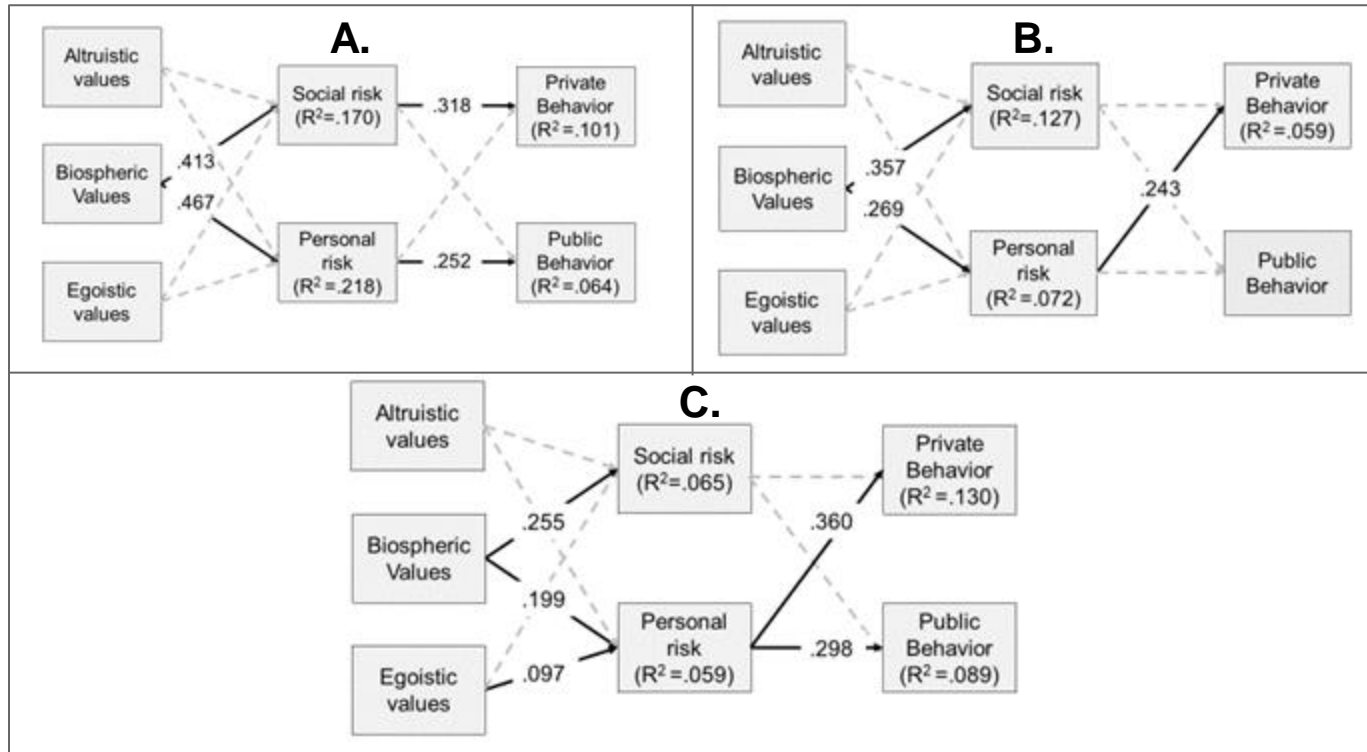


Anglers differ based on fishing location



- Subgroup comparison showed drivers of angler behavior varied across fishing locations

A. Great Lakes & tributaries (20%), B. Inland waterways (30%), C. Mixed use (50%)



Golebie, van Riper, Stedman & Suski (in press). *NAJFM*.

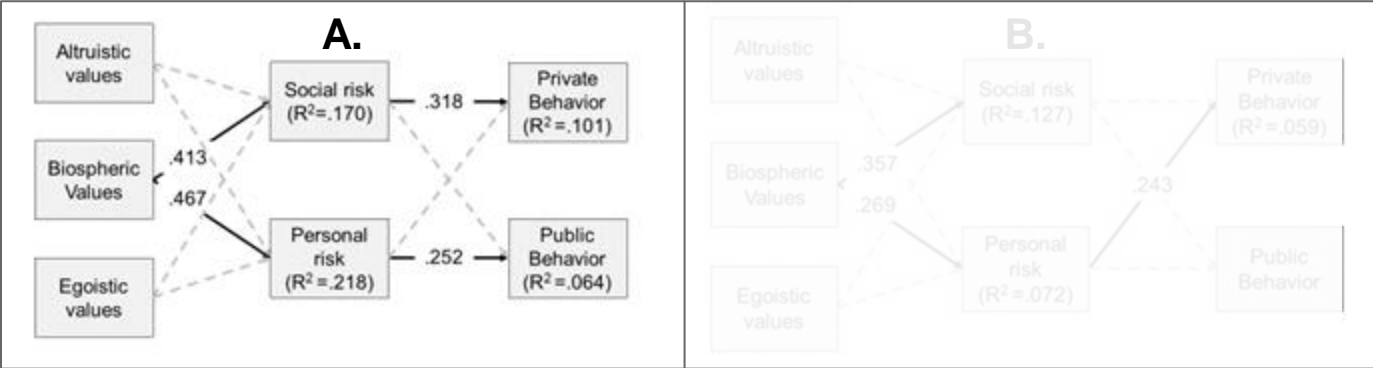


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- Do:** Emphasize threats to both individuals and other people
- Do:** Highlight how management provides benefits for the environment
- Do not:** Emphasize achievement and social justice in the reasons why management decisions are made

Golebie, van Riper, Stedman & Suski (in press). *NAJFM*.

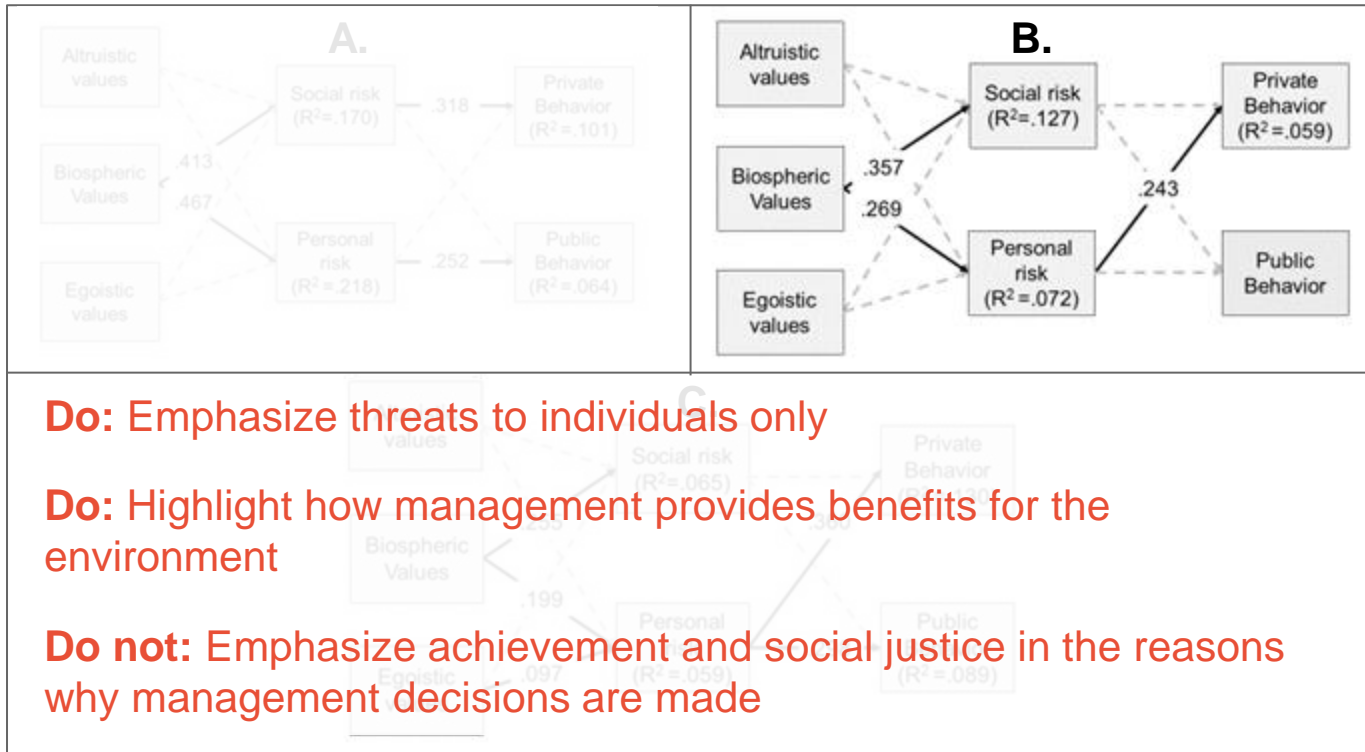


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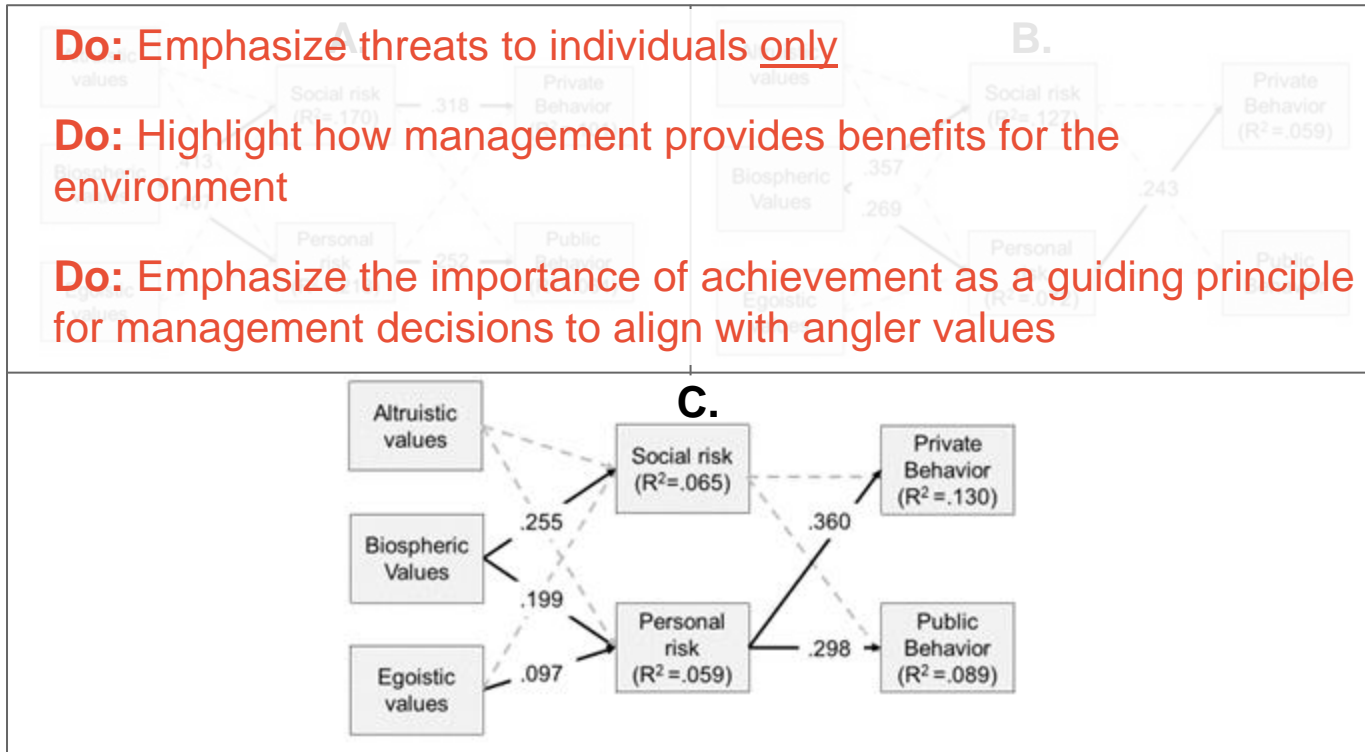


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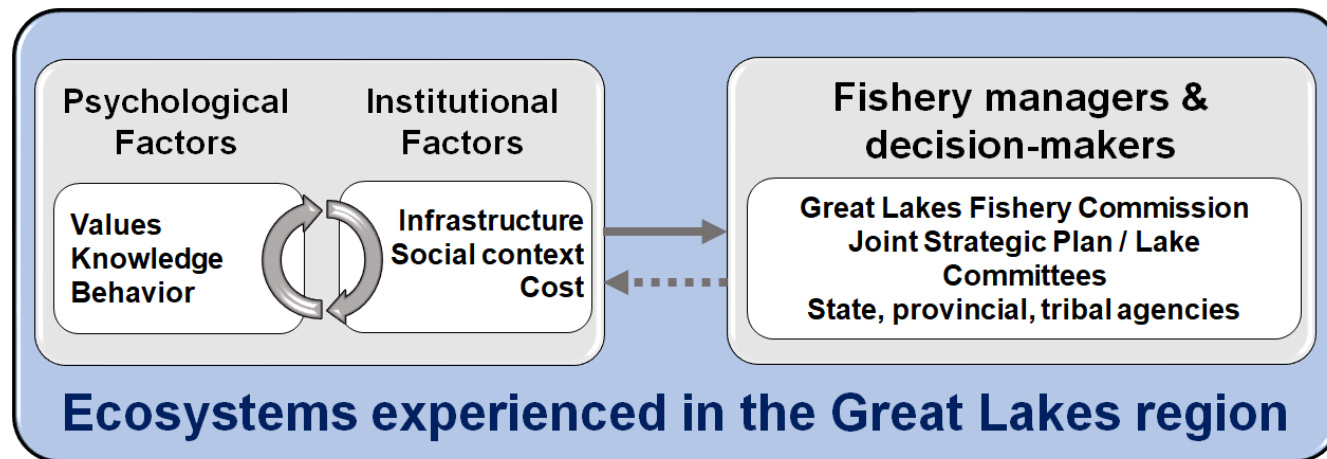
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Golebie, van Riper, Stedman & Suski (in press). *NAJFM*.



- **Invasive species are impacting aquatic ecosystems** and are unintentionally spread by anglers
 - **Short and long-term factors can close the knowledge-action gap** and illustrate what motivates behavior
- Integrating knowledge from different disciplines is useful for solving complex problems involving angler behavior



van Riper, Stedman & Suski. 2019. *GLFC Technical Report*.

<https://ecommons.cornell.edu/bitstream/handle/1813/103593/CCSS%20Report%2020-7.pdf>



Future research directions



- Shifts are needed **to focus more attention on long-term** as compared to short-term drivers of behavior
 - Stronger and more complete models of decision-making
 - More theoretically robust but challenging to illustrate value for decision-making
- Values, in particular, carry **managerial relevance**
 - Reasons for social conflict
 - Long-term solutions
- **Message framing to align with values** shows great promise as an area for future research
 - Pathways for enhanced communication strategies



Thanks for your attention

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