What we're learning talking to scientists about science communication

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[w/Anthony Dudo
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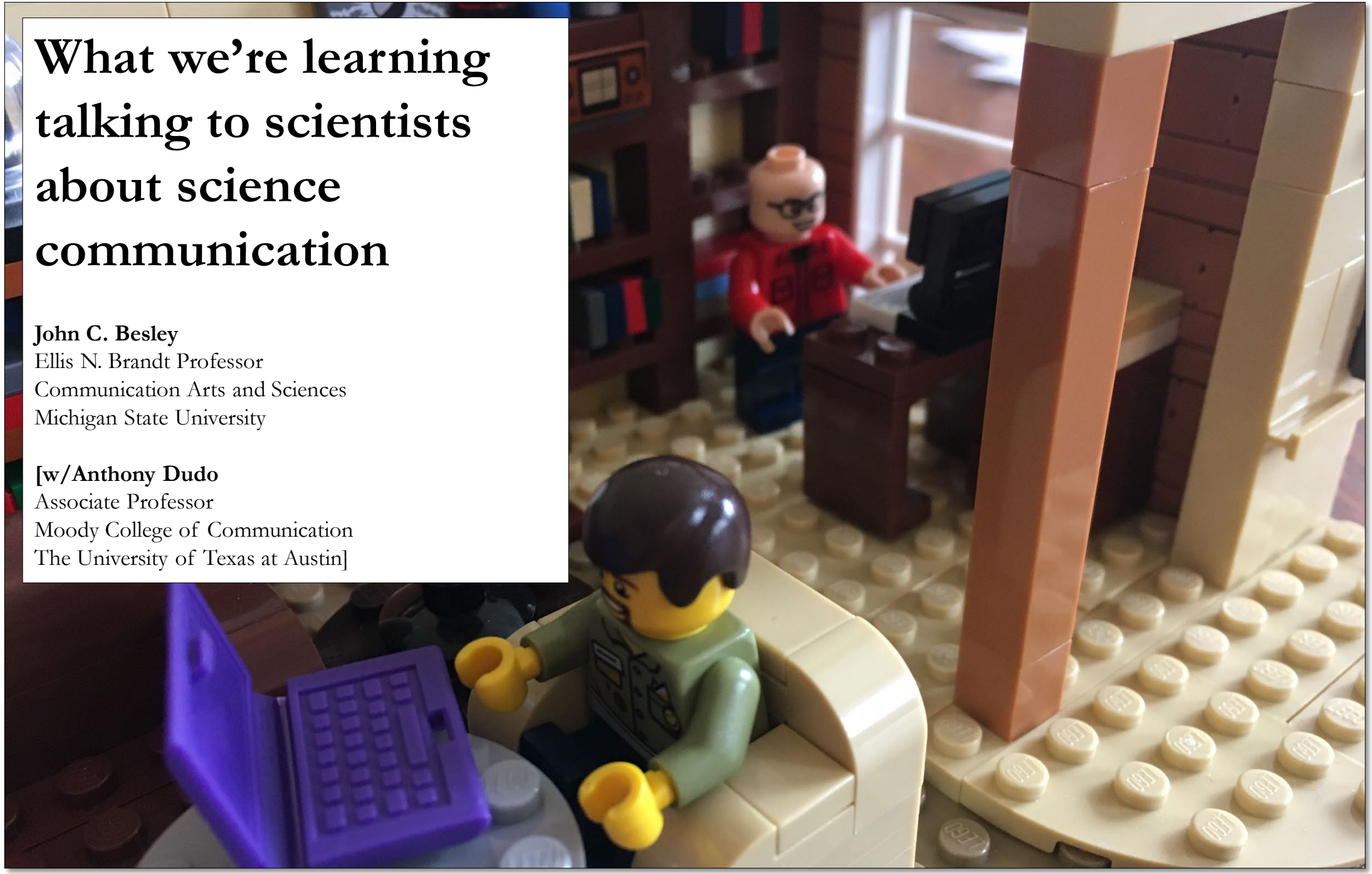
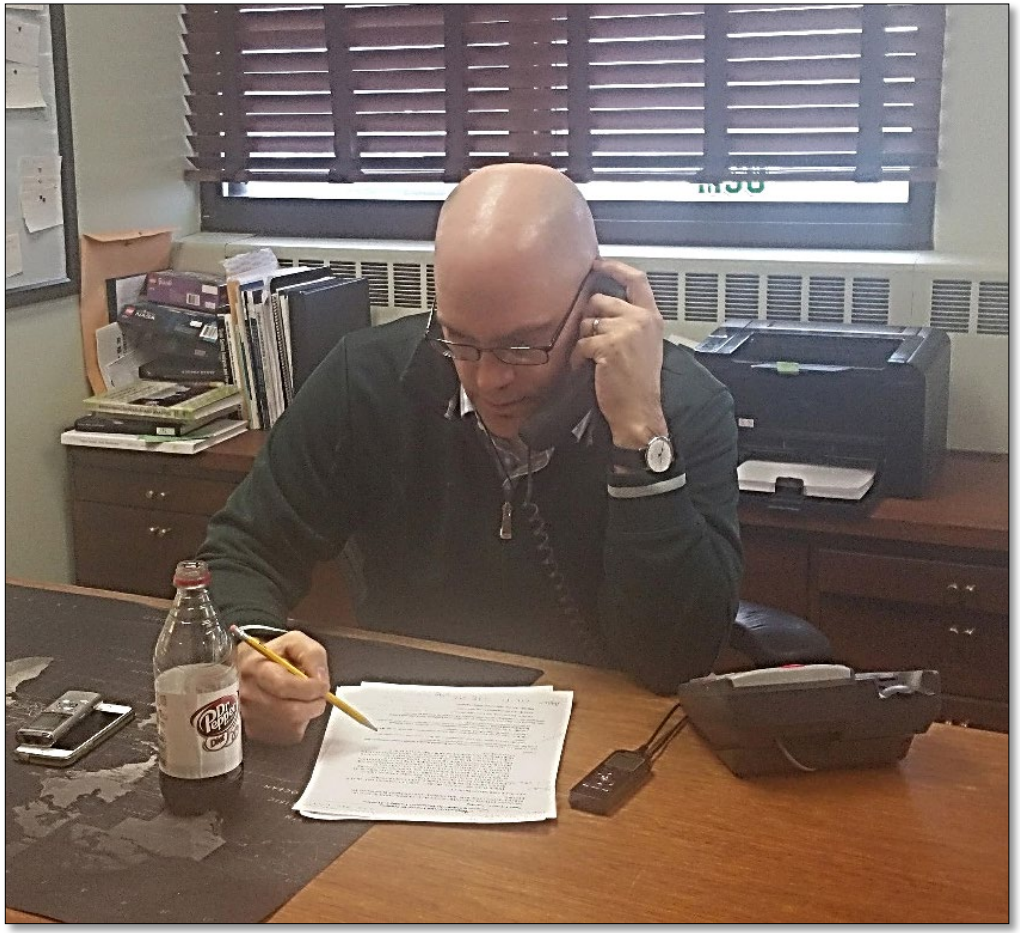
The University of Texas at Austin]



This material is based upon work supported by the National Science Foundation (NSF, Grant AISL 1421214-1421723. Any opinions, findings, conclusions, or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the NSF.

Background

- Research on public's views about science and scientists
- Research to help science community communicate more effectively
  - Interviews with key actors
  - Surveys of scientists



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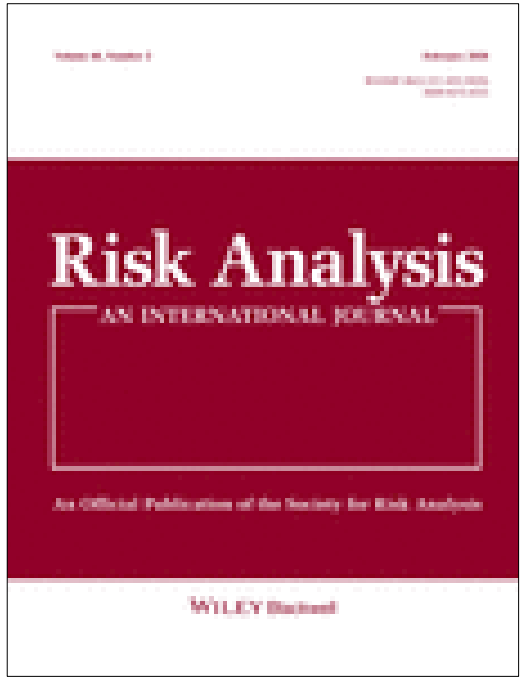
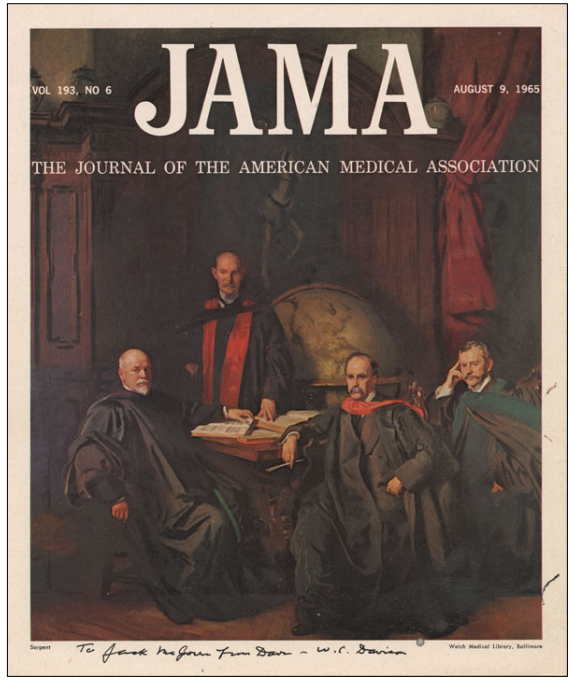
A broad understanding of science communication

(and a differentiation from science education)



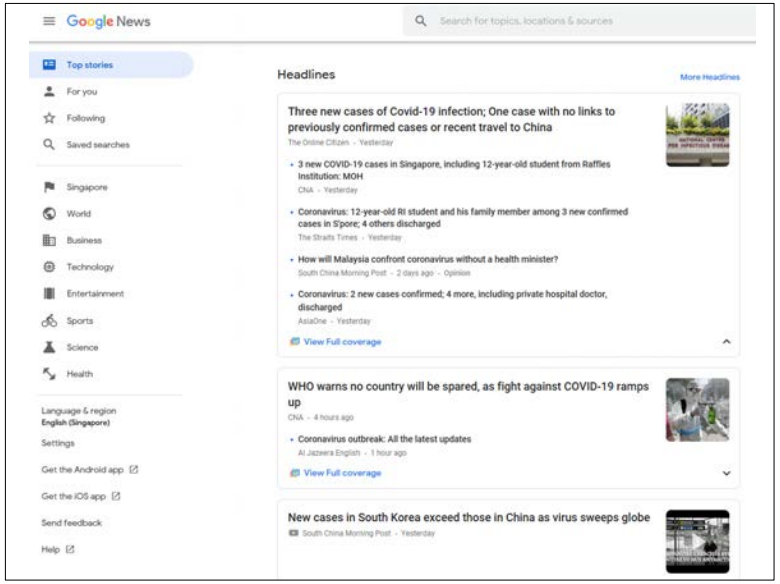


A broad understanding of science communication

(and a differentiation from science education)

Stakeholders/Publics

Decision-makers



Mediated Audiences

Images from Flickr Creative Commons: Oregon Dept. of Trans., Audience

Initial question: How can we get more scientists to communicate?

Research Article

Science Communication
2018, Vol. 40(5) 559–590

Understanding Scientists' Willingness to Engage

John C. Besley[1], Anthony Dudo[2], Shupei Yuan[3], and Frank Lawrence[1]

Scientists are willing to engage …

	General Scientific Society			Biological Society I	Biological Society II		Chemistry Society			Geophysical Society		
Mode	F2F	Media	Online	F2F	F2F	Online	F2F	Media	Online	F2F	Media	Online
Engage willingness												
Not all willing (1)	3%	6%	19%	4%	2%	14%	3%	9%	15%	1%	3%	10%
(2)	3%	5%	12%	3%	2%	7%	6%	7%	10%	2%	4%	8%
(3)	3%	5%	8%	3%	2%	7%	3%	5%	9%	2%	4%	7%
Neutral (4)	11%	16%	20%	13%	10%	19%	15%	26%	23%	8%	16%	19%
(5)	17%	19%	14%	20%	17%	16%	17%	16%	14%	14%	17%	17%
(6)	27%	23%	13%	24%	29%	16%	25%	19%	14%	29%	26%	17%
Very willing (7)	36%	27%	15%	33%	39%	21%	31%	18%	15%	44%	32%	22%

N = 4,073 (Ecological and geological society data not shown)

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Research Article

Science Communication
2018, Vol. 40(5) 559–590

Understanding Scientists' Willingness to Engage

John C. Besley[1], Anthony Dudo[2], Shupei Yuan[3], and Frank Lawrence[1]

… especially likely if scientists believe:

- It will be enjoyable (attitude)
- It will be effective (response efficacy)
- They have the time (behavioral control)

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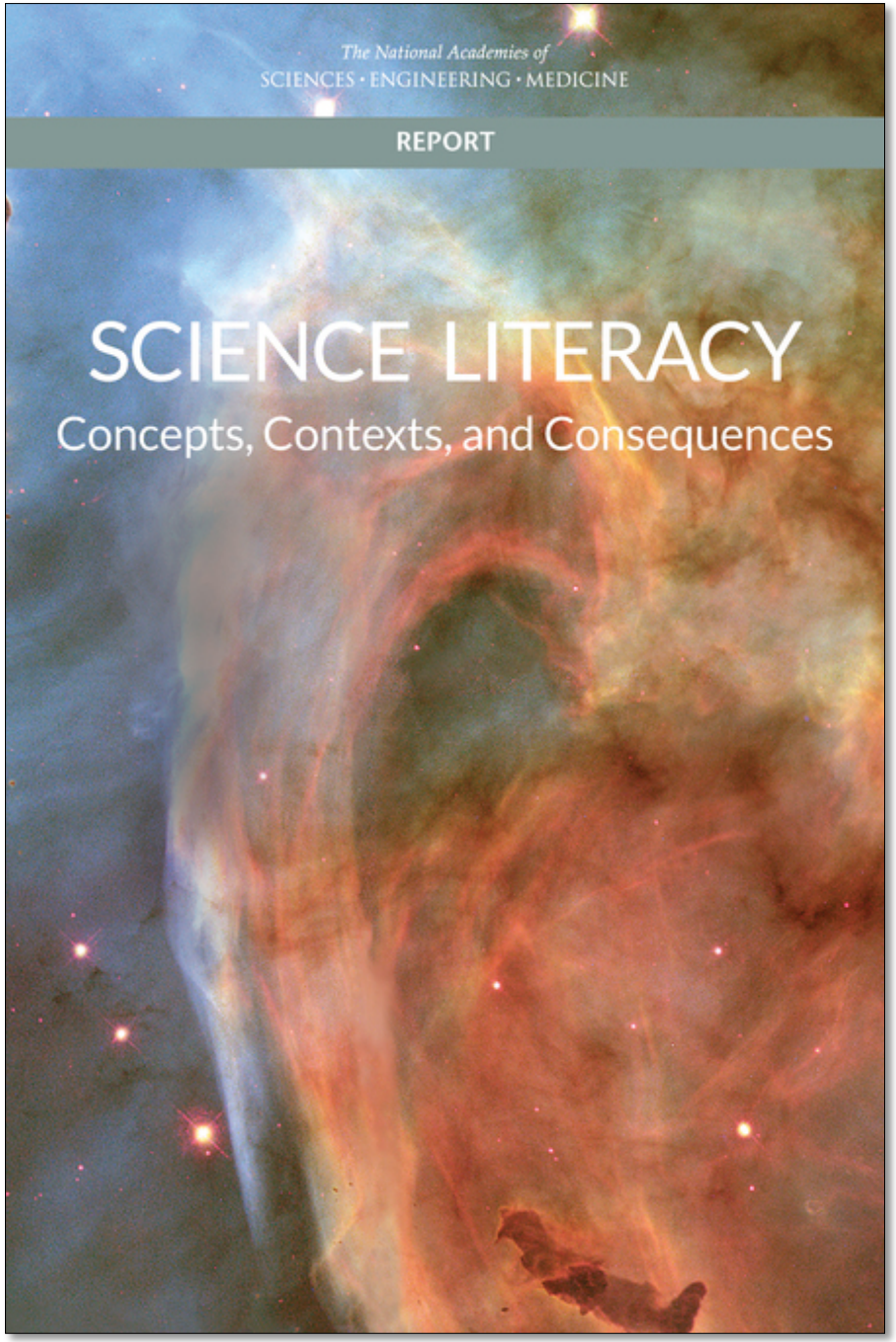
Current Question: How can we get scientists (or other part-time science communicators) to communicate more effectively?

The fundamental challenge of science communication

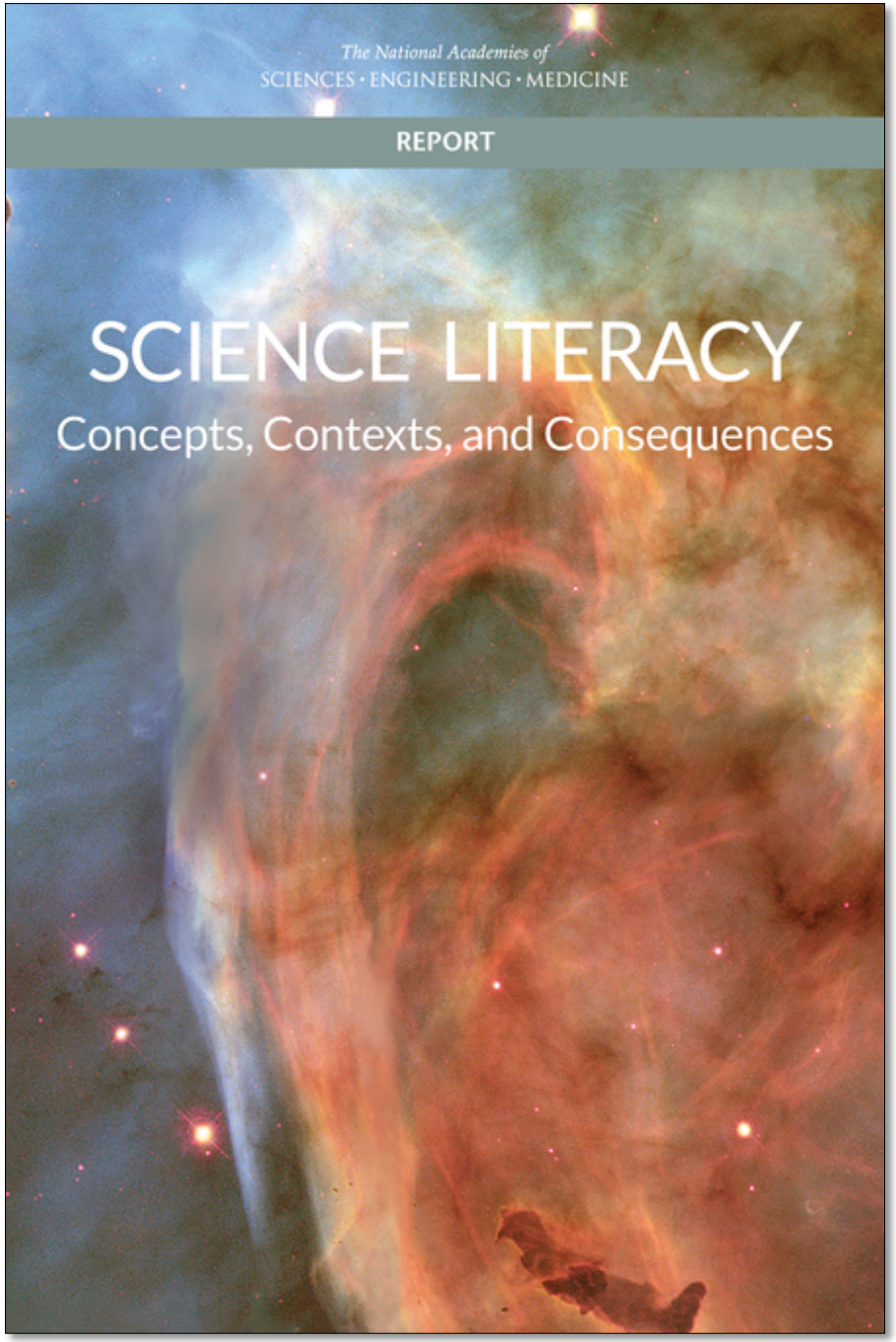
"Available research does not support the claim that increasing science literacy will lead to appreciably greater support for science ..."



Communication

$\neq$

Translation, Distillation, Explanation, etc.



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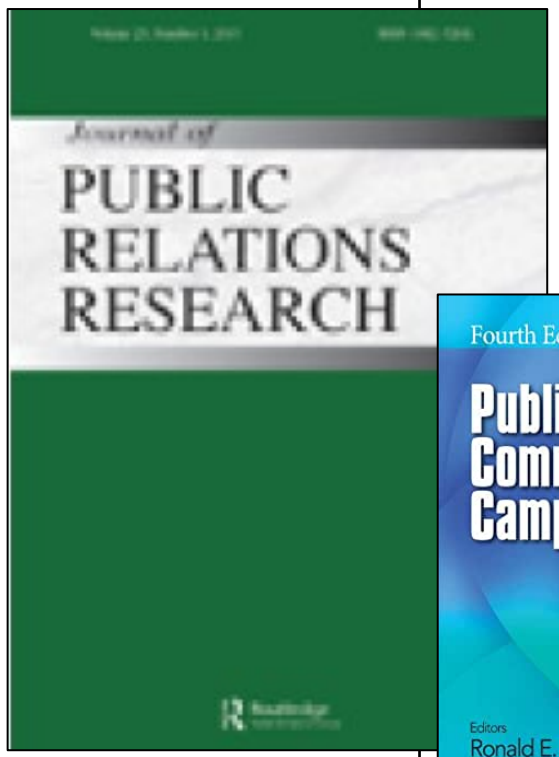
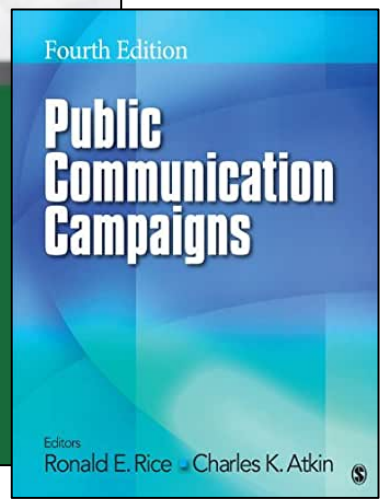
What do we mean by effective?

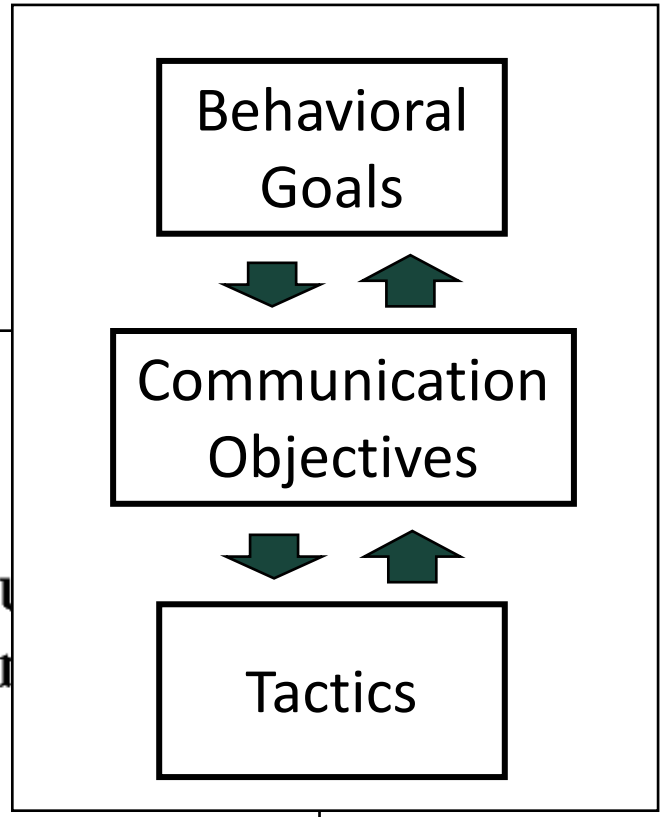




JOURNAL OF PUBLIC RELATIONS RESEARCH, *10*(2), 103–135

Demonstrating Effectiveness in Pu Relations: Goals, Objectives, ar Evaluation

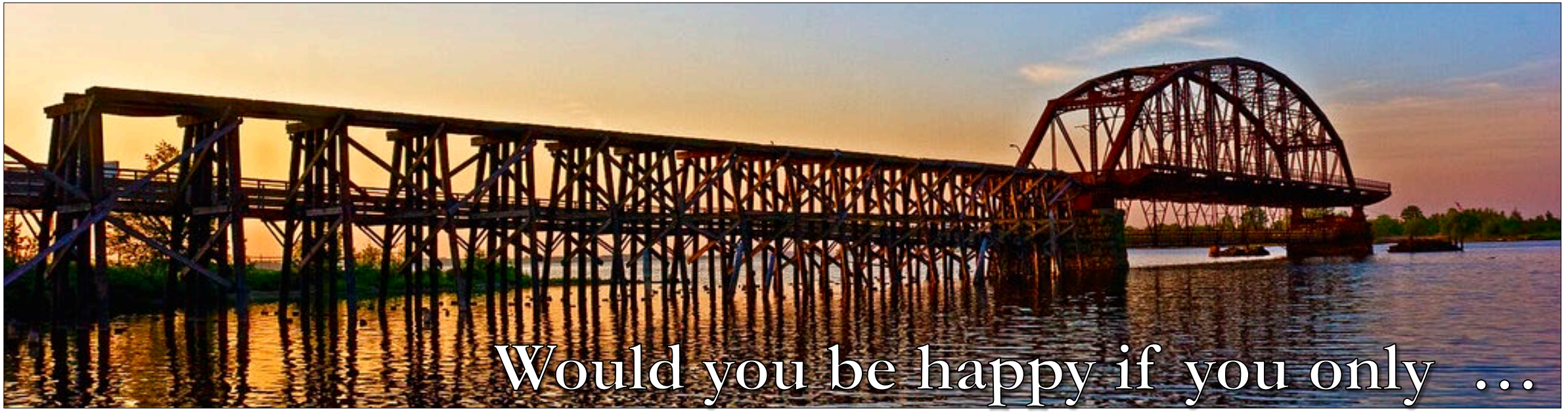
Linda Childers Hon
Department of Public Relations
College of Journalism and Communications
University of Florida



What do we mean by behavioral goals?

What do you hope will happen from
the time, money, and energy
you put into communicating?

?



Randen Pederson, Bridge to Nowwhere, via Flickr Creative Commons

What do we mean by behavioral goals?

What do you hope will happen from the time, money, and energy you put into communicating?

Policy support/acceptance
Research priority setting/framing
Trust (As willing to be vulnerable)
Individual behavior
(including career choice)

Buying/donating

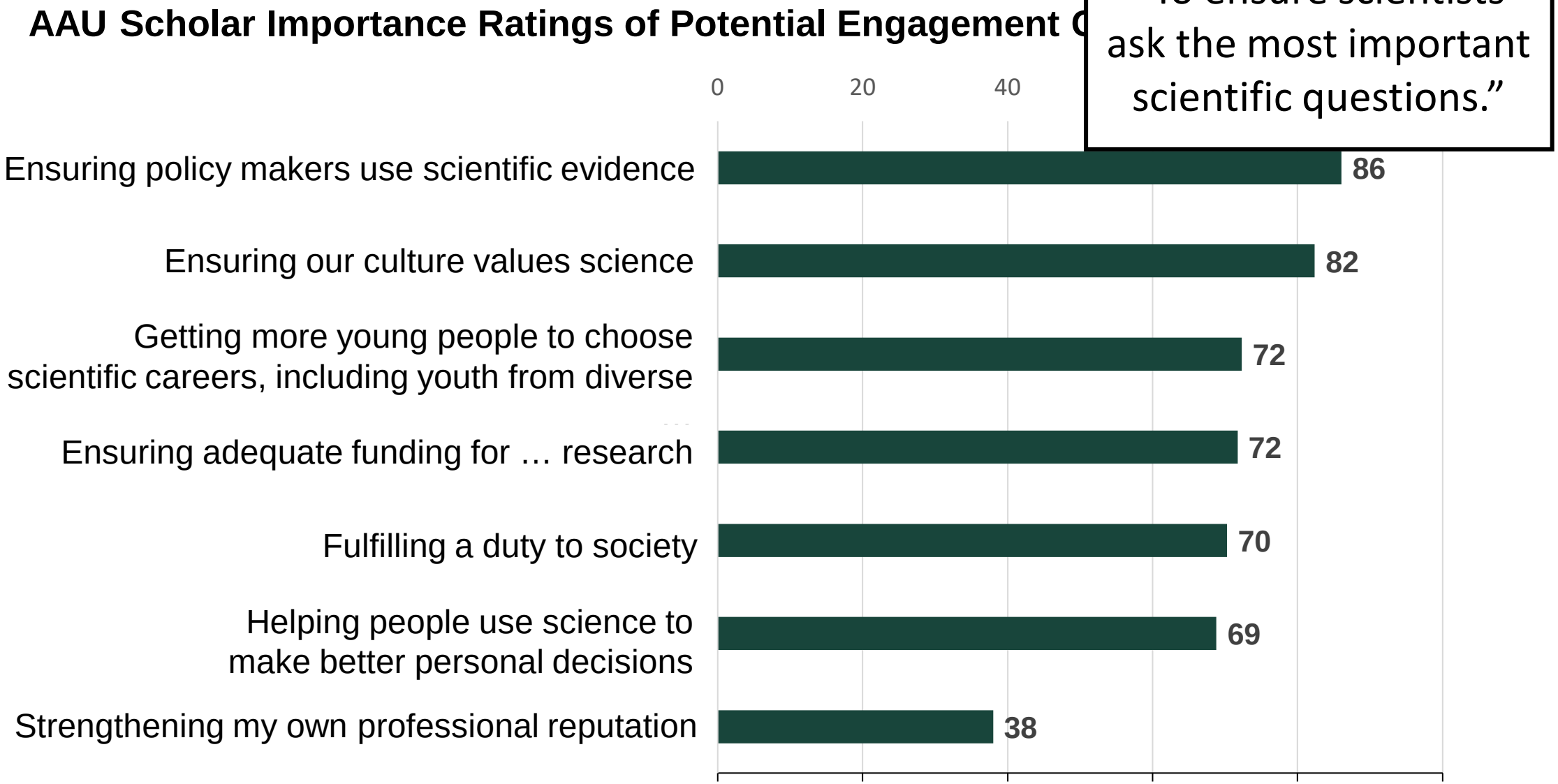
Acting/behaving

Supporting

Legitimacy/
Behavioral Trust

Scientists have goals …

A missing goal:
"To ensure scientists ask the most important scientific questions."

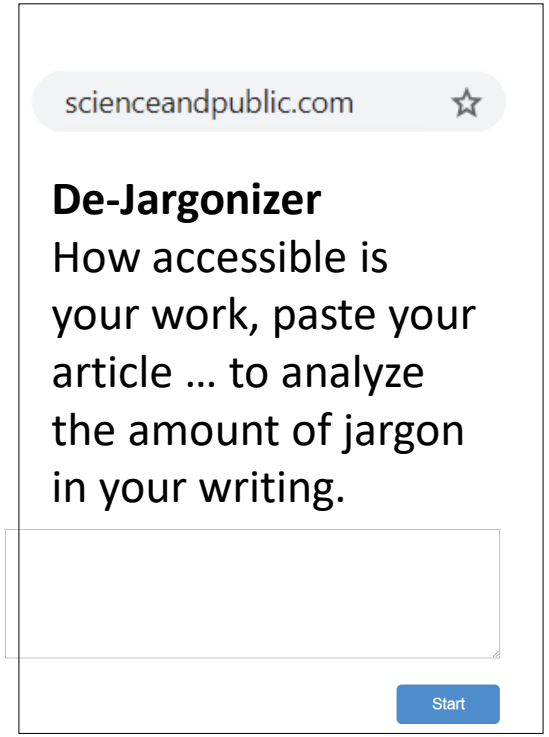


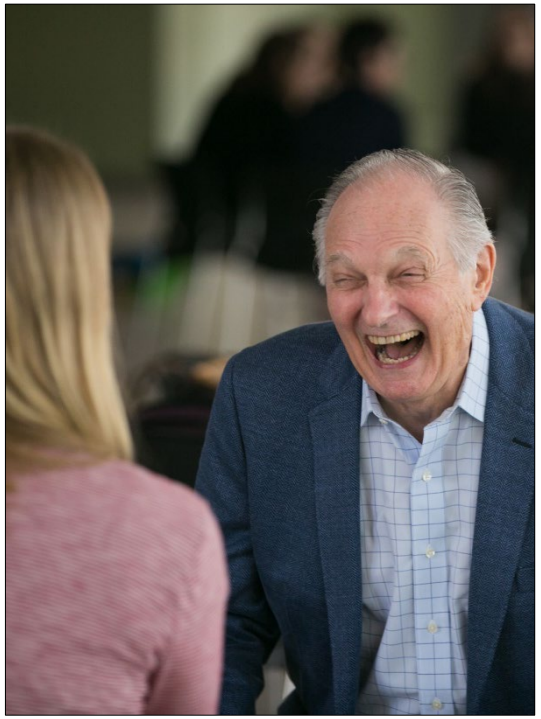
Fall 2018, 11% Response Rate, n =~516

What do we mean by tactics?

Behaviors
Messages
Tone/Intensity/Style
Channels
Sources

Who says (or does) what to/with who in what way and through what channel?

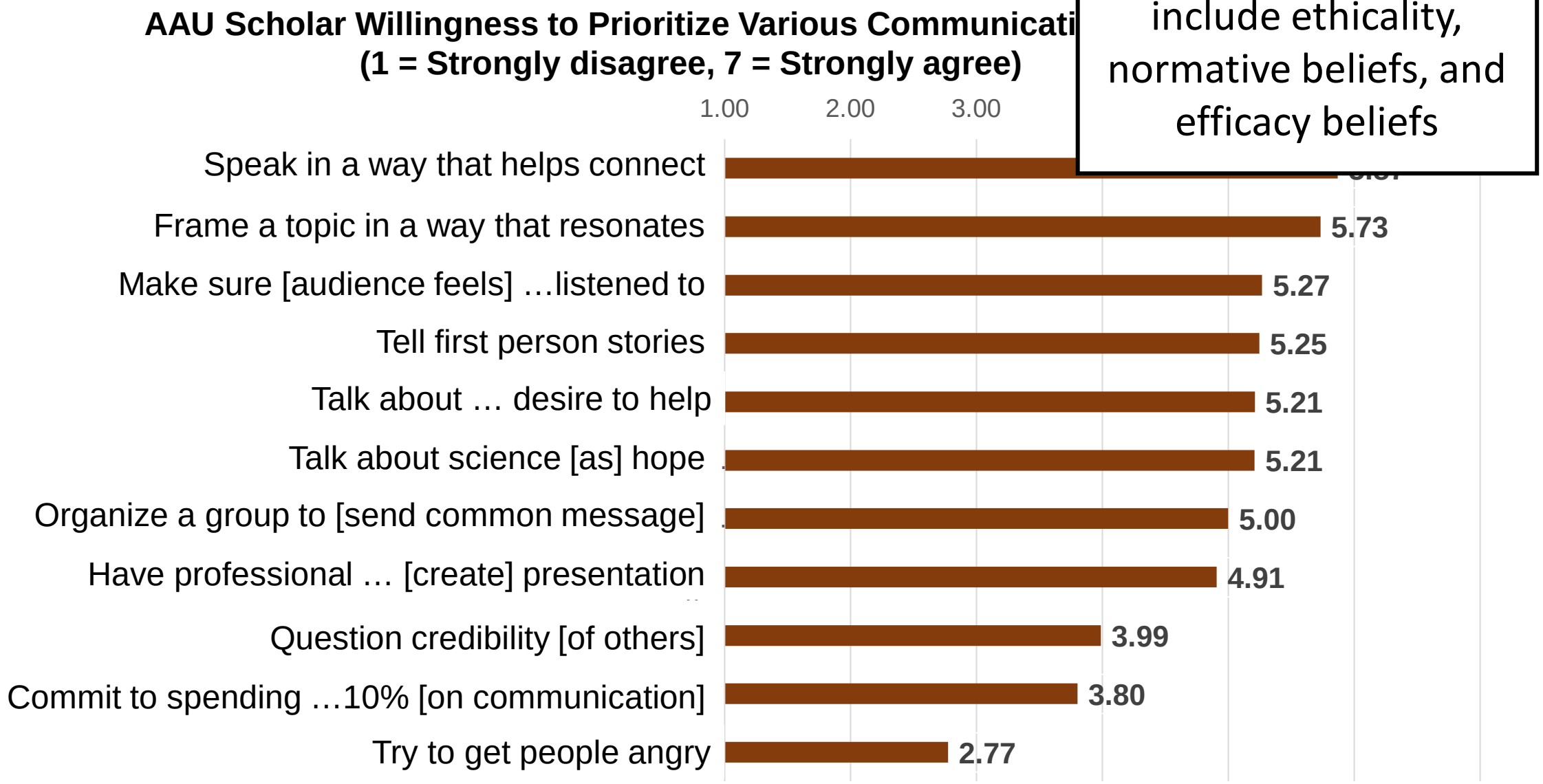




Most training …
Emphasis on 'translation,' storytelling, new social channels, and fostering dialogue (+ more)

Scientists are open to many potential ta

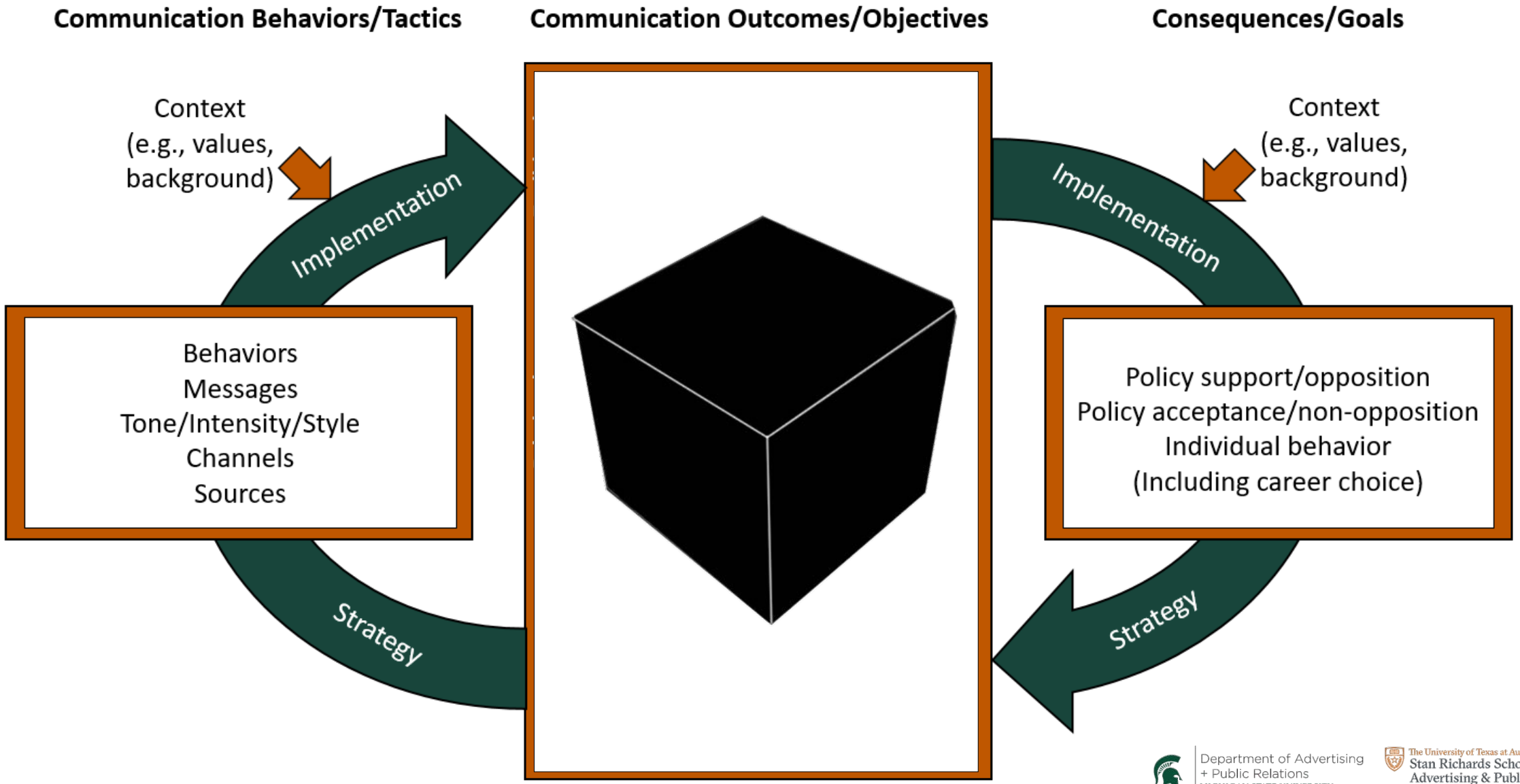
Statistical predictors include ethicality, normative beliefs, and efficacy beliefs



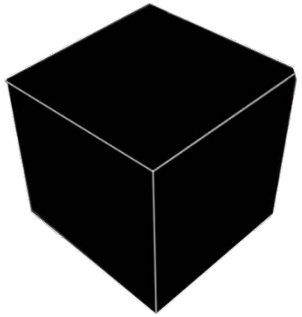
See also: Besley, J. C., O'Hara, K., & Dudo, A. (2019). … *PLoS ONE, 14(10)*

Fall 2018, 11% Response Rate, n =~516

What about communication objectives?



The central role of communication objectives …



Communication effects researchers study the 'outcome' of communication (i.e., tactics) and the impact of these outcomes on behaviors (goals)

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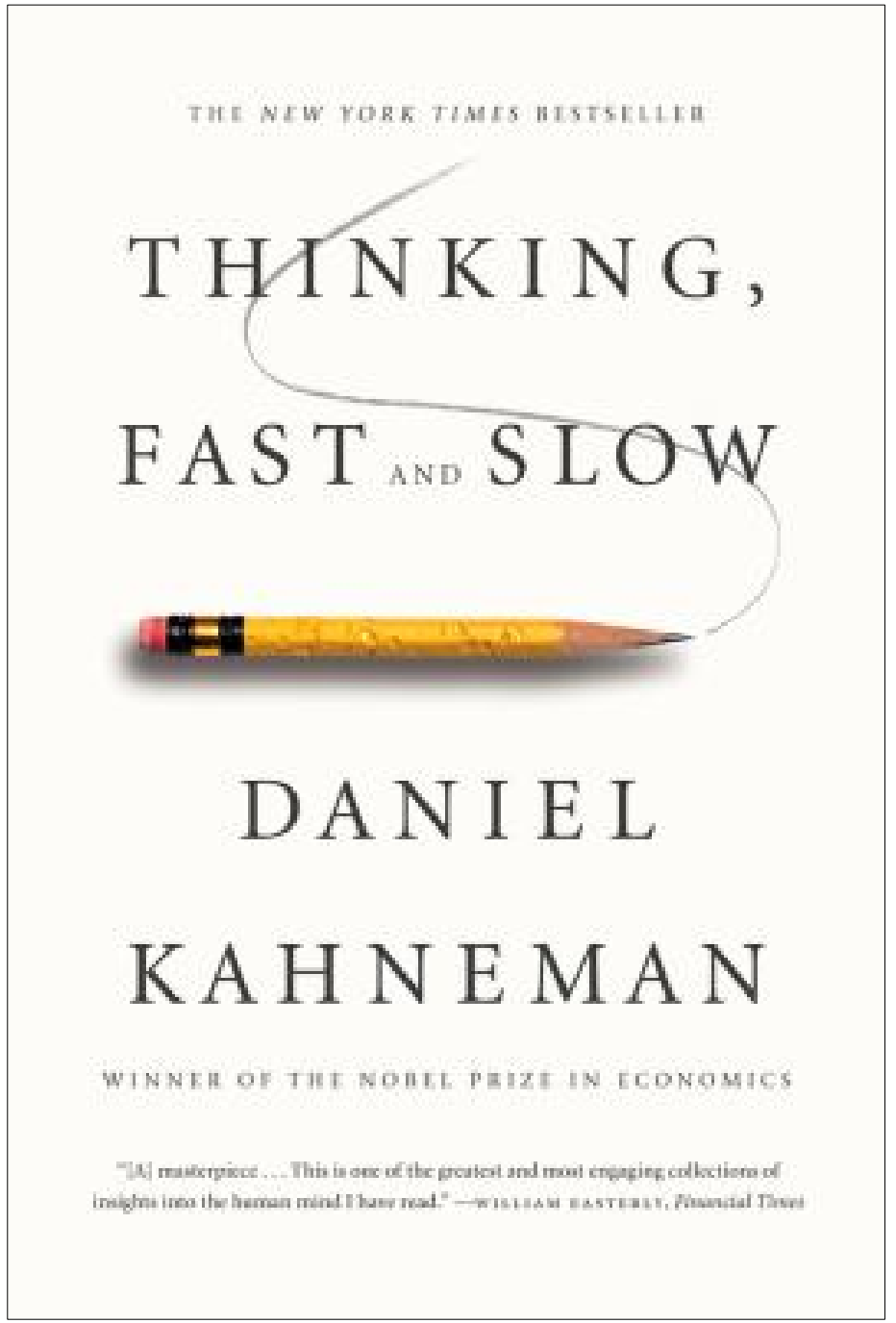
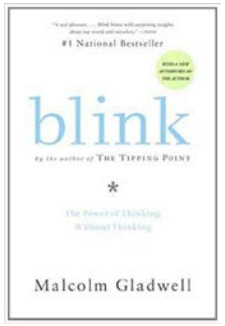
How do we think communication works?

Many communication effects occur quickly and automatically (system 1) but some are also the result of slower but deeper amounts of **cognitive engagement** (system 2)



Also know as …
Systematic processing
Central route processing.
See also …



How do we think slow communication works?

Paul Sableman, Dripping via Flickr Creative Commons

Over time, efforts to foster deeper engagement with science and scientists should result in long-term, cumulative changes to all communication participants evaluative beliefs

$$A_o = \sum_{i=1}^{n} b_i e_i$$

Attitudes are the sum of available beliefs (b) and the evaluation (e) of those beliefs

Several different types of 'beliefs' (and feelings and frames) can result from communication

Traditional

- Factual knowledge/Awareness
- Affect/Emotion
- Framing/Cognitive Schema

Relational/Trustworthiness

- Warmth/Benevolence Beliefs
- Honesty/Integrity Beliefs
- Willingness to Listen Beliefs
- Identity/Shared Value Beliefs
- Competence/Ability Beliefs

Behavioral

- Perceived Risk/Benefit Beliefs
- Normative Beliefs
- Self Efficacy Beliefs

Behavioral Goals

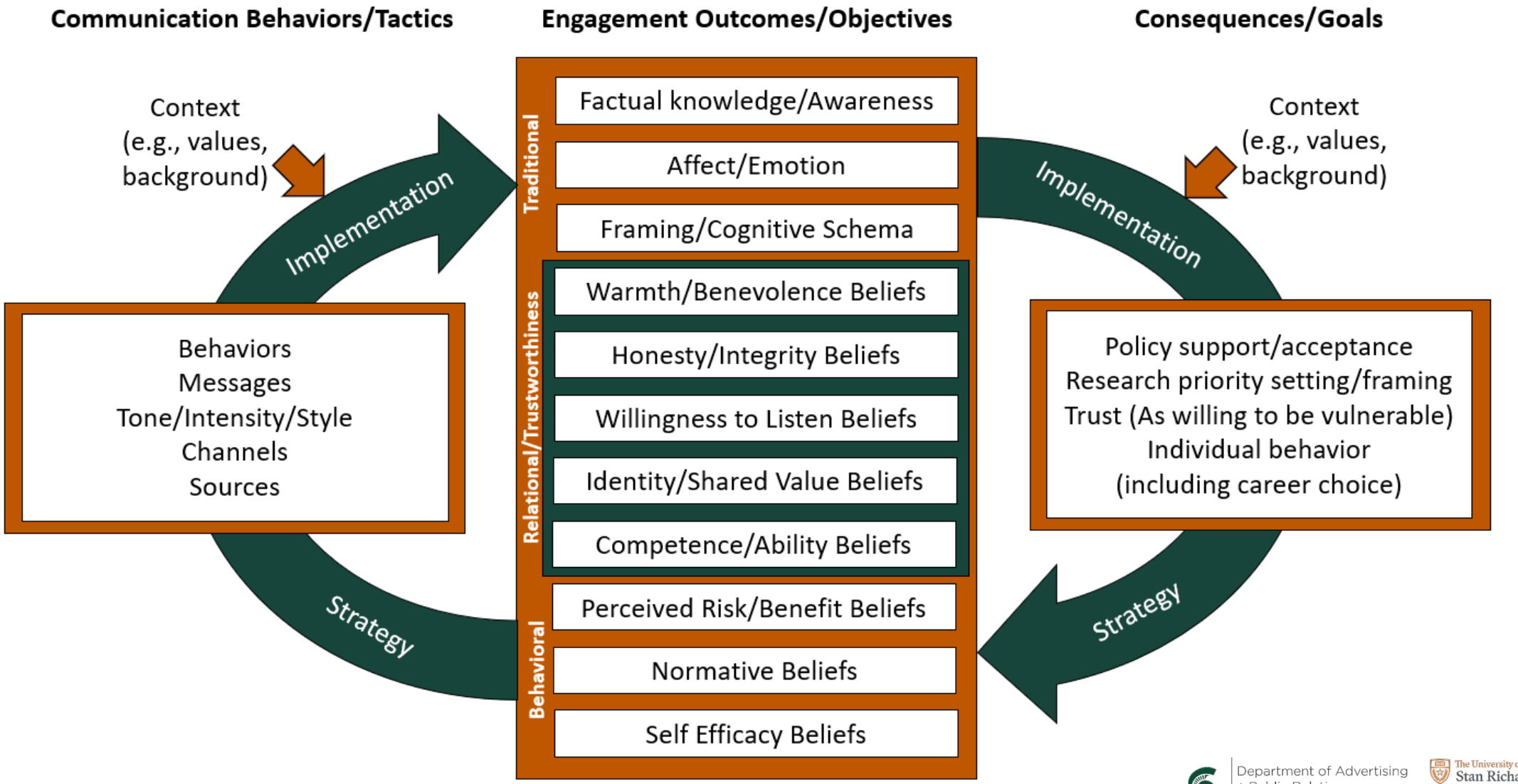
- Outcome of many factors
- Chosen based on priorities

Communication objectives

- Beliefs, feelings, frames (+salience)
- Direct effect of communication
- Chosen based on goals/context

vs. Cognitive processes (motivated reasoning, biased processing), SES, personality, traits, ideology/values, etc.

What do we mean by strategy?



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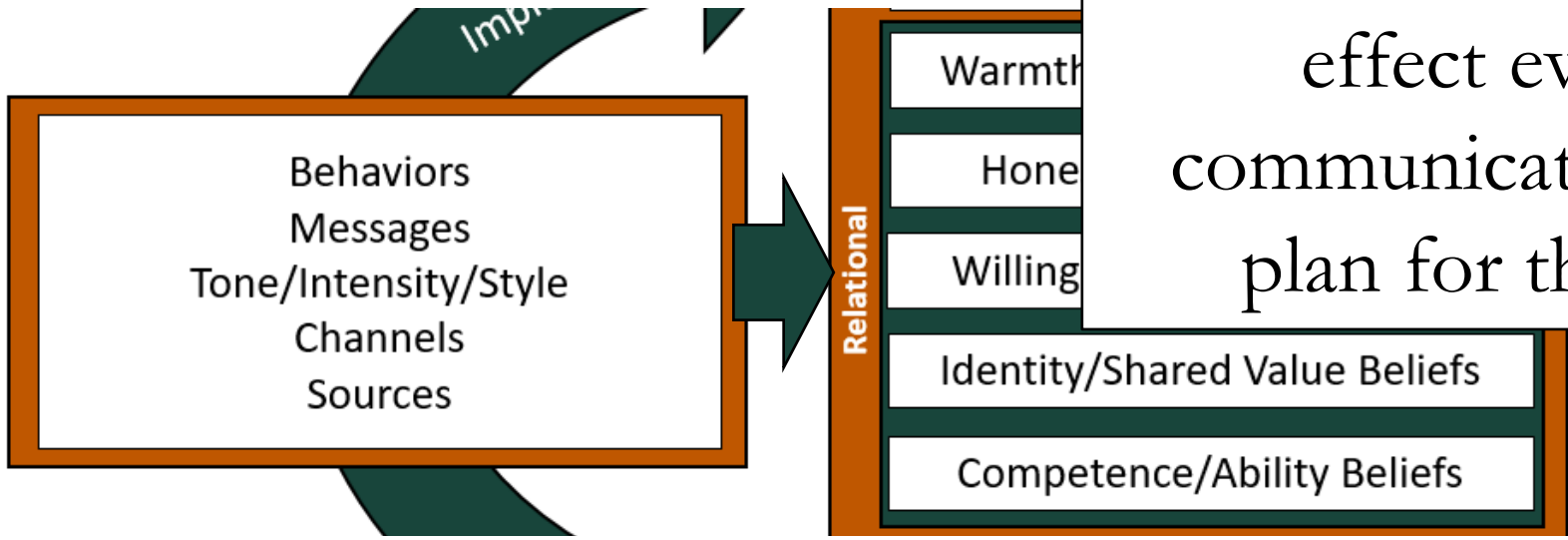
My favorite beliefs …



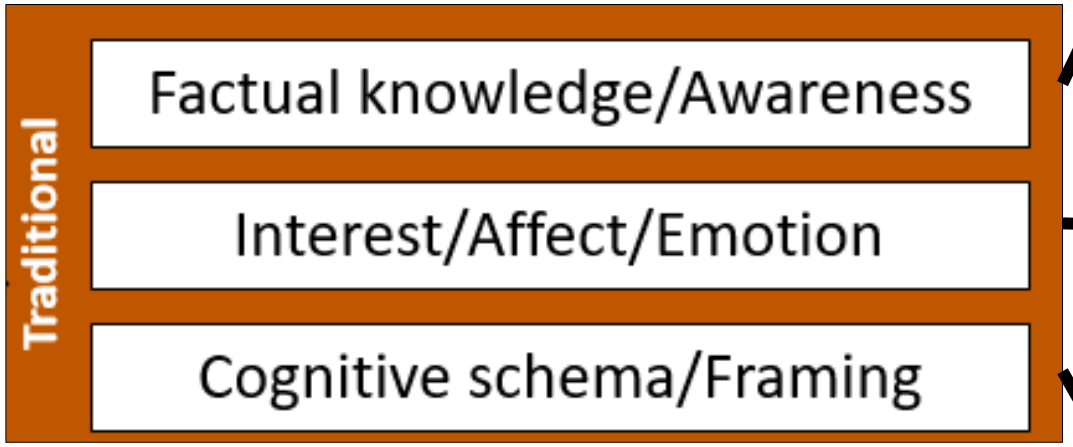
Recall that these beliefs will form and have an effect even if communicators don't plan for them …

Imagine you want those with whom you are communicating to believe scientists are the type of people who are willing to listen.

What tactics could you prioritize?

Other types of beliefs …

The 'traditional' objectives …



Public Understand. Sci. **17** (2008) 35–54

Science knowledge and attitudes across cultures: a meta-analysis

Nick Allum, Patrick Sturgis, Dimitra Tabourazi and Ian Brunton-Smith

Risk Analysis, Vol. 34, No. 5, 2014

The Role of Emotion in Global Warming Policy Support and Opposition

Nicholas Smith[1,*] and Anthony Leiserowitz[2]

Climatic Change (2012) 113:1105–1112

A public health frame arouses hopeful emotions about climate change

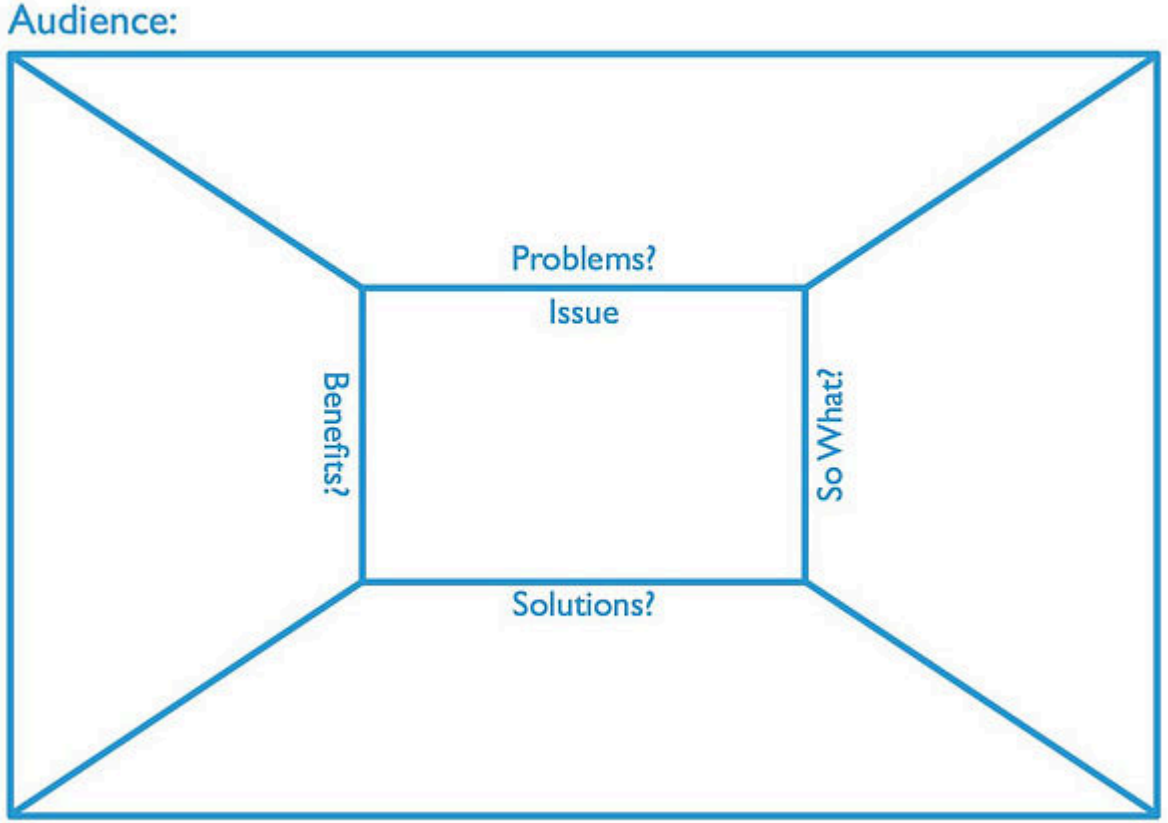
Teresa A. Myers · Matthew C. Nisbet · Edward W. Maibach · Anthony A. Leiserowitz

Other types of beliefs …

Theory of planned behavior/ Integrated Behavioral Model communication objectives

Perceived Risk/Benefit Beliefs

(Also response efficacy)



COMPASS

The Message Box Workbook

Communicating Your Science Effectively

Training focused on clearly articulating research benefits

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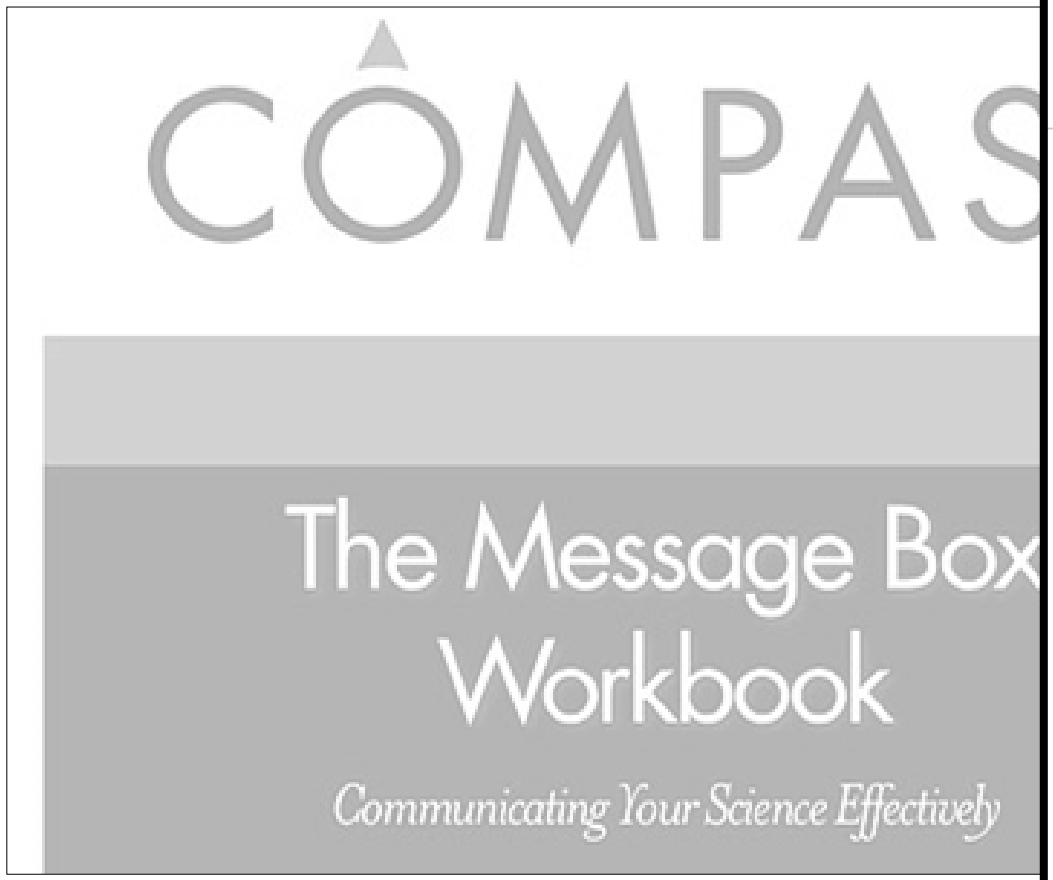
Perceived Risk/Benefit Beliefs

(Also response efficacy)

Audience:



AAAS
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

GIVE RESOURCE CENTER

WHO WE ARE | WHAT WE DO | GET INVOLVED

HOME | PROGRAMS | OFFICE GOVERNMENT RELATIONS

Golden Goose Award

The Golden Goose Award awards researchers whose seemingly obscure, federally-funded research has led to major breakthroughs. Since 2012, groups of researchers have been recognized each year for breakthroughs in the development of life-saving medicines and treatments; game-changing social and behavioral insights; and major technological advances related to national security, energy, the environment, communications, and public health.

Normative Beliefs

Campaign to shape/correct hidden descriptive norms

Self Efficacy Beliefs

Quitting is tough, but

BEING PREPARED

boosts your chances of success. Build a quit plan to get ready and find out what to expect along the way. Complete 7 easy steps to get your personalized quit plan.

Researchers are willing to prioritize a range of objectives

(but they haven't thought much about most)

AAU Scholar Prioritization of Potential Communication Objectives (Range 0-100)

Fall 2018, 11% Response Rate, n =~516

See also … Besley, J. C., Dudo, A., & Yuan, S. (2018). … *Public Understanding of Science, 27(6), 708-730;* Dudo, A., & Besley, J. C. (2016). … *PLoS ONE, 11(2).*

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A challenge of objectives is prioritizing the ones that are ethical, possible and will make the most difference, given the context

You can't have everything.

Jennie Park, Candy Store, via Flickr Creative Commons

Two great things about objectives: Part I, Evaluation

Clear objectives enable evaluation

Participant Survey

Thank you for coming to today's event. Before you go, we'd like to hear from you about a few things …

First, how would you rate the overall event?	Poor ○	Fair ○	Good ○	Very Good ○	Excellent ○
Prior to this event, how much did you know about the topic[s] of the event?	Nothing at all ○	Only a little ○	A moderate amount ○	A lot ○	A great deal ○
How much, if anything, did you learn from the event that you participated in?	Nothing at all ○	Only a little ○	A moderate amount ○	A lot ○	A great deal ○
How interesting or uninteresting did you find the event?	Very uninteresting ○	Somewhat uninteresting ○	Neither Interesting nor uninteresting ○	Somewhat interesting ○	Very interesting ○

And thinking specifically about the main scientist you heard from …

How much did they seem to care or not care about helping others?	Hardly care at all ○	Mostly don't care ○	Couldn't Tell/ Neither ○	Care a fair amount ○	Care a great deal ○
How sincere or insincere did they seem?	Very insincere ○	Somewhat insincere ○	Couldn't Tell/ Neither ○	Somewhat sincere ○	Very sincere ○
How open-minded or closed-minded did they seem?	Very closed-minded ○	Somewhat closed-minded ○	Couldn't Tell/ Neither ○	Somewhat open-minded ○	Very open-minded ○
How willing or unwilling did they seem to consider others' point of view?	Very unwilling ○	Somewhat unwilling ○	Couldn't Tell/ Neither ○	Somewhat willing ○	Very willing ○
How competent or incompetent did they seem?	Very incompetent ○	Somewhat incompetent ○	Couldn't Tell/ Neither ○	Somewhat competent ○	Very competent ○
How intelligent or unintelligent did they seem?	Very unintelligent ○	Somewhat unintelligent ○	Couldn't Tell/ Neither ○	Somewhat intelligent ○	Very intelligent ○
How informed or uniformed did they seem?	Very uninformed ○	Somewhat uninformed ○	Couldn't Tell/ Neither ○	Somewhat informed ○	Very informed ○
How willing or unwilling would you be to take advice from them in their area of expertise?	Very unwilling ○	Somewhat unwilling ○	Couldn't Tell/ Neither ○	Somewhat willing ○	Very willing ○
Overall, how positive or negative was your impression of the scientist?	Very negative ○	Somewhat negative ○	Neither positive nor negative ○	Somewhat positive ○	Very positive ○

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Two great things about objectives: Part II, Clarity

What makes dialogue/narratives/ non-jargon so great as tactics for engagement?

https://www.nifi.org/en/about

Current Question: How can we get scientists (or other part-time science communicators) to communicate more effectively?

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(Also frames and emotions)

Scientists Trust Beliefs (Benevolence, Integrity, Ability, Openness, Similarity)

Scientists' Attitudes (Evaluative beliefs about the desired behavior)

Scientists' Descriptive and Injunctive Normative Beliefs about Communication

Scientists' Self- and Response Efficacy Beliefs about Communication

Willingness/Intent to Prioritize/Perform Communication Behavior

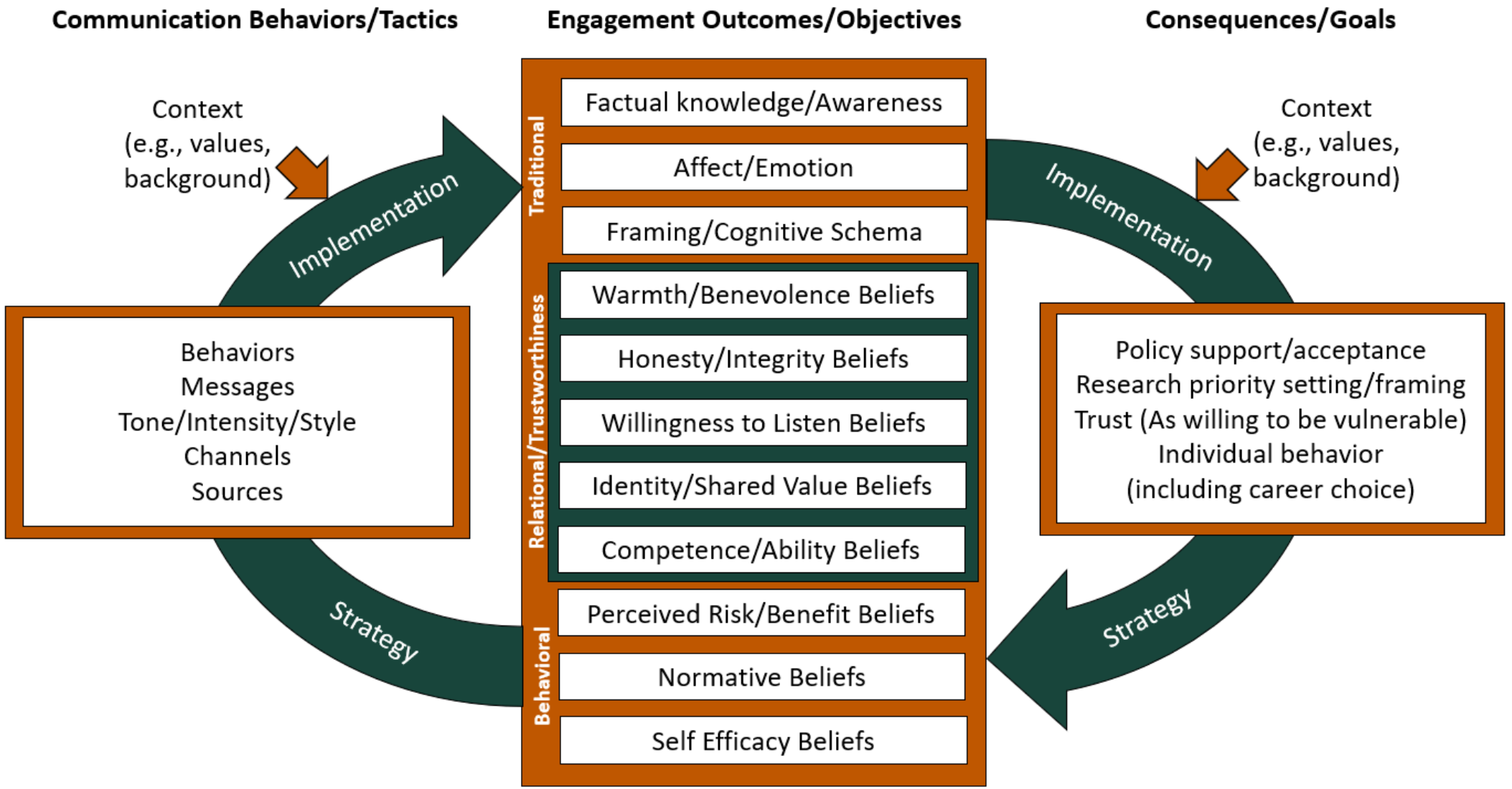
Scientist budget 10% for science communication/public engagement/hire professional

"Strategic Science Communication as Planned Behavior …"

Building on: Fishbein, M., & Ajzen, I. (2010). *Predicting and Changing Behavior: The Reasoned Action Approach. New York: Psychology Press.*

Montano, D. E., & Kasprzyk, D. (2015). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. In K. Glanz (Ed.), *Health behavior: Theory, research and practice (5th ed.). Hoboken, NJ: Wiley-Blackwell.*

Discussion? Questions?



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