Scientists' Perceptions of Infrastructure-related Barriers: Insights From The Social Sciences

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Sustainable Infrastructures for Life Sciences Communication: A Workshop

National Academy of Sciences' Roundtable on Public Interfaces of the Life Sciences, December 9–10, 2013

This Talk: An Overview

- Science-media interactions: a cross-cultural snapshot
- Why engage with traditional media? Intrinsic rewards vs. extrinsic rewards
- A case study: Engaging through social media at a R1 University
- Online buzz and academic impact

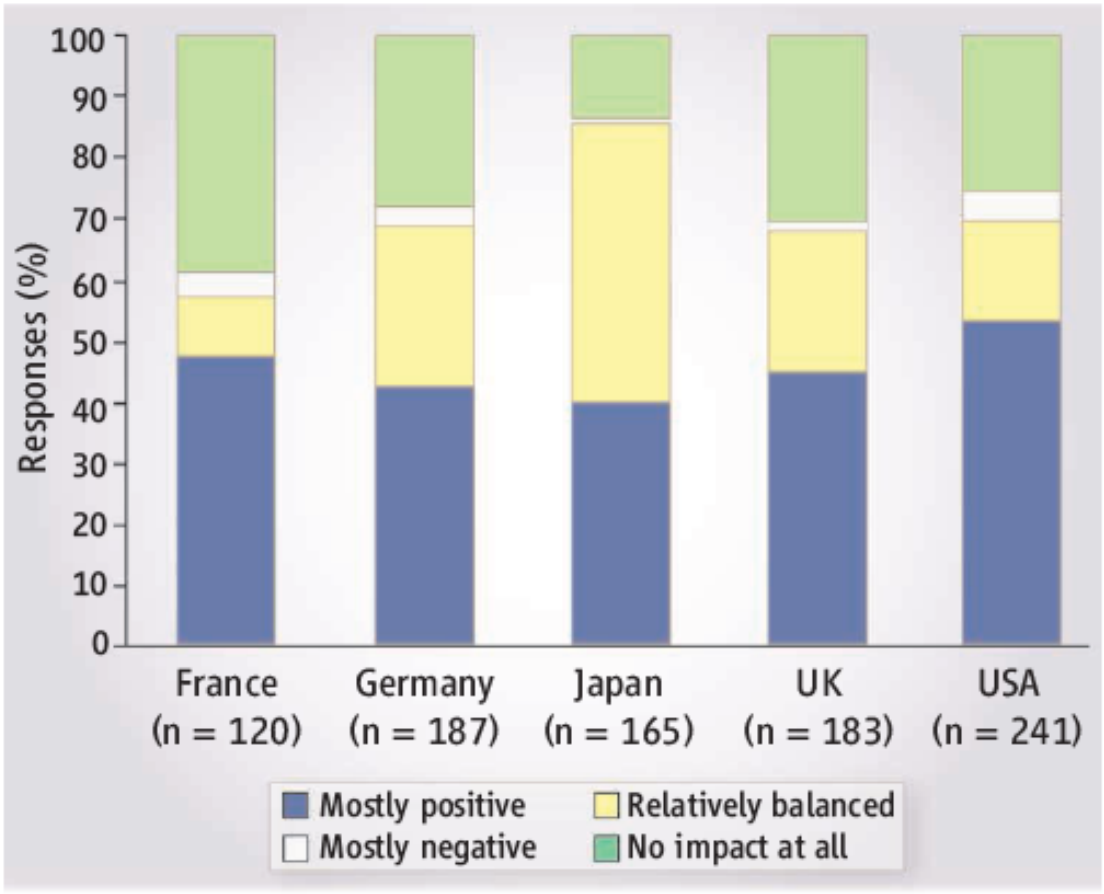
Interactions Between Scientists and Journalists Are More Frequent Than Previously Thought

Peters, H. P., Brossard, D., de Cheveigné, S., Dunwoody, S., Kallfass, M., Miller, S., & Tsuchida, S. (2008). Science communication: Interactions with the mass media. *Science*, 321(5886), 204-205.

- 2005-2006 study of 1,200 biomedical scientists in 5 top R&D countries

- Journalistic engagement of scientists over time is greater and more stable than persistent, anecdotal tales would suggest
  - 30% said they had been engaged in more than five media contacts in the past 3 years
  - 39% reported one to five contacts.
  - No statistical significant differences between countries

Interactions Between Scientists and Journalists Are Perceived Positively



Perceived impact of media contacts on career by country. Distribution of answers to the question: "Consider the totality of your media contacts over your career. How great has their positive or negative impact been on you professionally?" Only respondents reporting media contact(s) in the past 3 years are included in the graph.

From:
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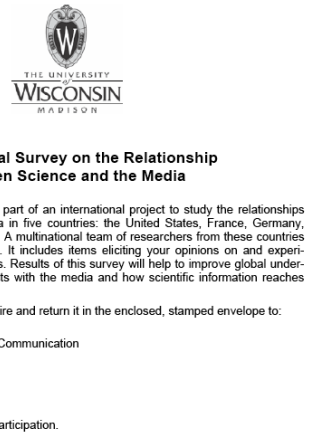
Explaining American Scientists' Interactions with Traditional Media

Dunwoody, S. Brossard, D., & Dudo, A. (2009). Socialization or rewards? Predicting American scientists-media interactions. *Journalism and Mass Communication Quarterly, 86*(2), 299-313.

Multi-wave mail survey of U.S. biomedical scientists

- stem cell researchers and epidemiologists
- *N* = 1200; Response Rate = 34.5%



THE UNIVERSITY OF WISCONSIN MADISON

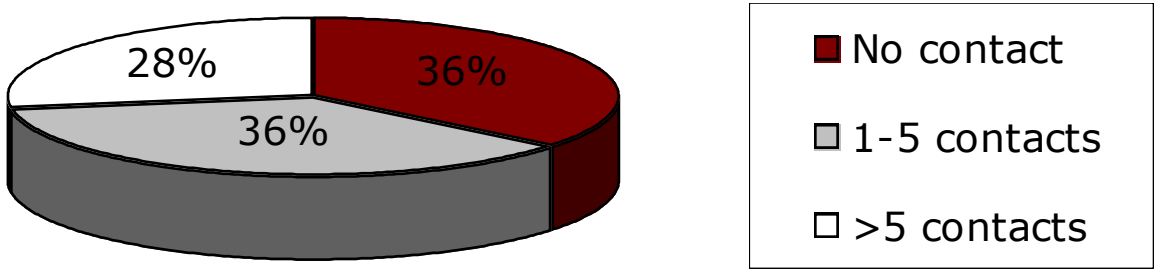
International Survey on the Relationship Between Science and the Media

This mail survey of scientists is part of an international project to study the relationships between science and the media in five countries: the United States, France, Germany, Japan, and the United Kingdom. A multinational team of researchers from these countries has compiled the questionnaire. It includes items eliciting your opinions on and experiences with media and journalists. Results of this survey will help to improve global understanding of how science interacts with the media and how scientific information reaches the public.

Please complete this questionnaire and return it in the enclosed, stamped envelope to:

Science and the Media
School of Journalism and Mass Communication
University of Wisconsin-Madison
5115 Vilas Hall
821 University Ave.
Madison, WI 53706

Thank you in advance for your participation.



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Status: career level (junior/mid/senior) & number of publications (5 levels)

Intrinsic Rewards: scientists' amount of personal enjoyment (e.g., explain research to public, contribute to public debate. …)

Extrinsic Negative Rewards: concerns that increase reluctance to have media contact (e.g., critical reaction from peers, negative publicity)

Extrinsic Positive Rewards: outcomes that make scientists positive about media contacts (e.g., more visibility for funders, enhanced public reputation)

Media Familiarity: exposure and attention to general and science news for three media channels

Formal Communication Training: received formal communication training & number of distinct audiences the training skills addressed (e.g., public, media)

Communication Self Efficacy: scientists' perception of how easily they can engage in 5 public communication activities (e.g., adjust to different audiences, deal with objections)

Predicting Scientists' Interactions with Traditional Media

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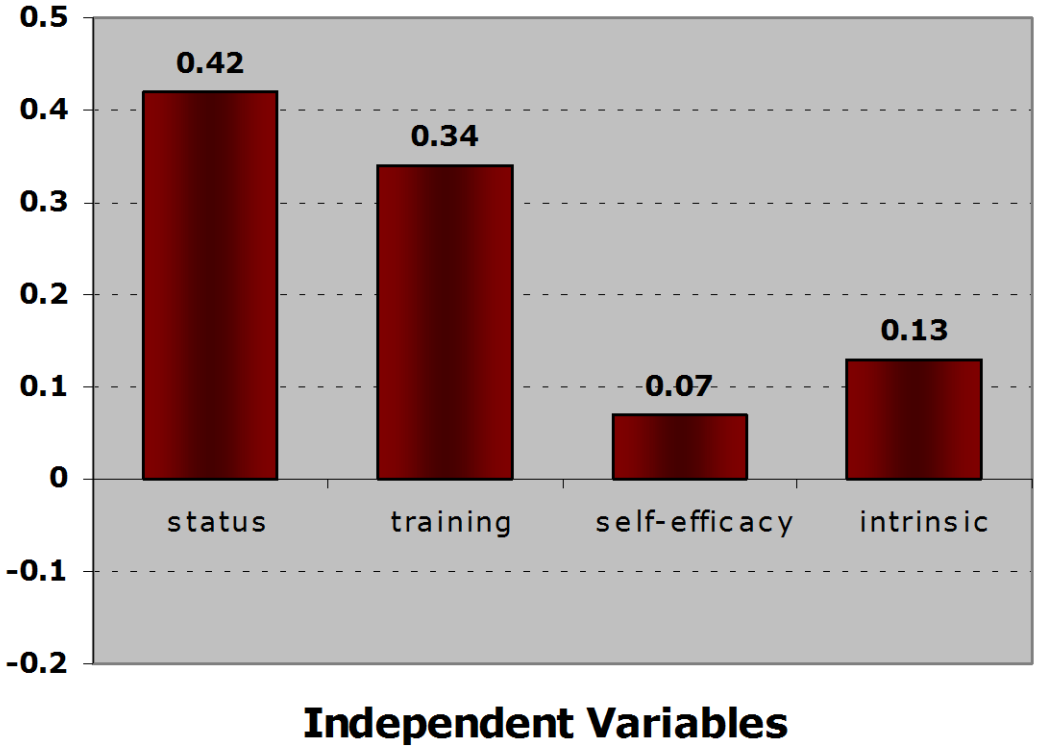

=> No statistically significant evidence that frequency of media interactions is related to extrinsic rewards

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The Rise of Science Blogging/Tweeting

"it's not possible to talk about science blogging without talking about scientists blogging, or more broadly about scientists writing."

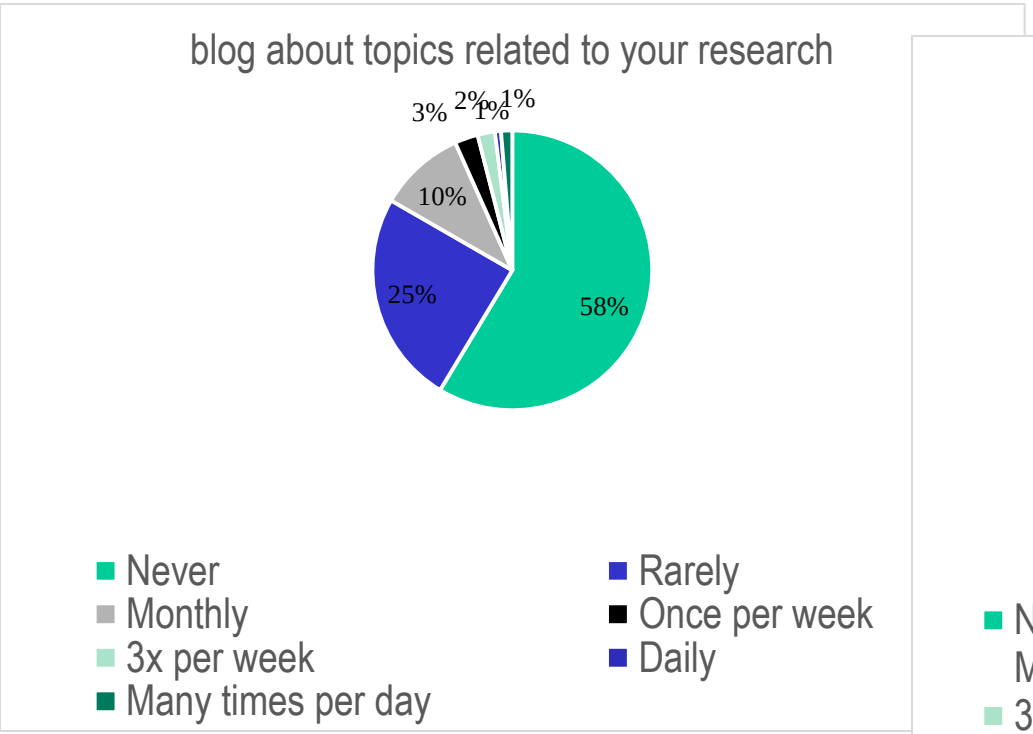
Franci, M. (2011). *Nature Chemistry 3*, 183-184

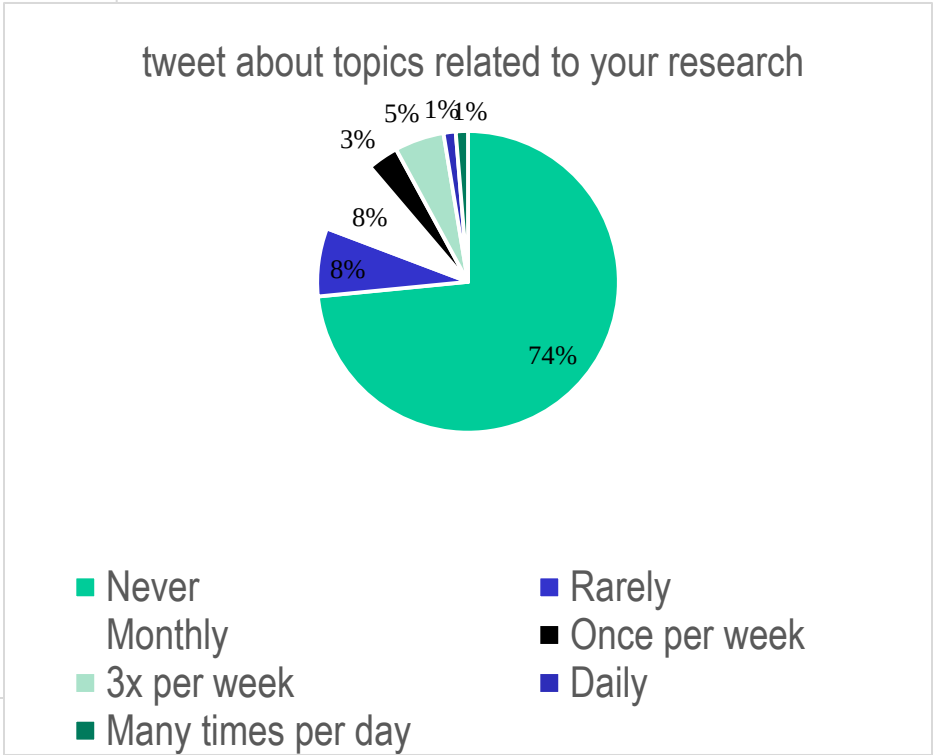
…The rise of a new type of scientists?

Explaining Scientists' Engagement Through Social Media

Yeo, S.K., Cacciatore, M.A., Brossard, D., Schefeule, D.A. & Xenos, M. (2014). Twitter as the social media of choice for sharing science. Paper to be presented at the 2014 PCST Convention, Salvador, Brazil.

- Survey of STEM tenured track scientists at a large R1 university
- Dillman's TDM method; 20.5% response rate; final N=254



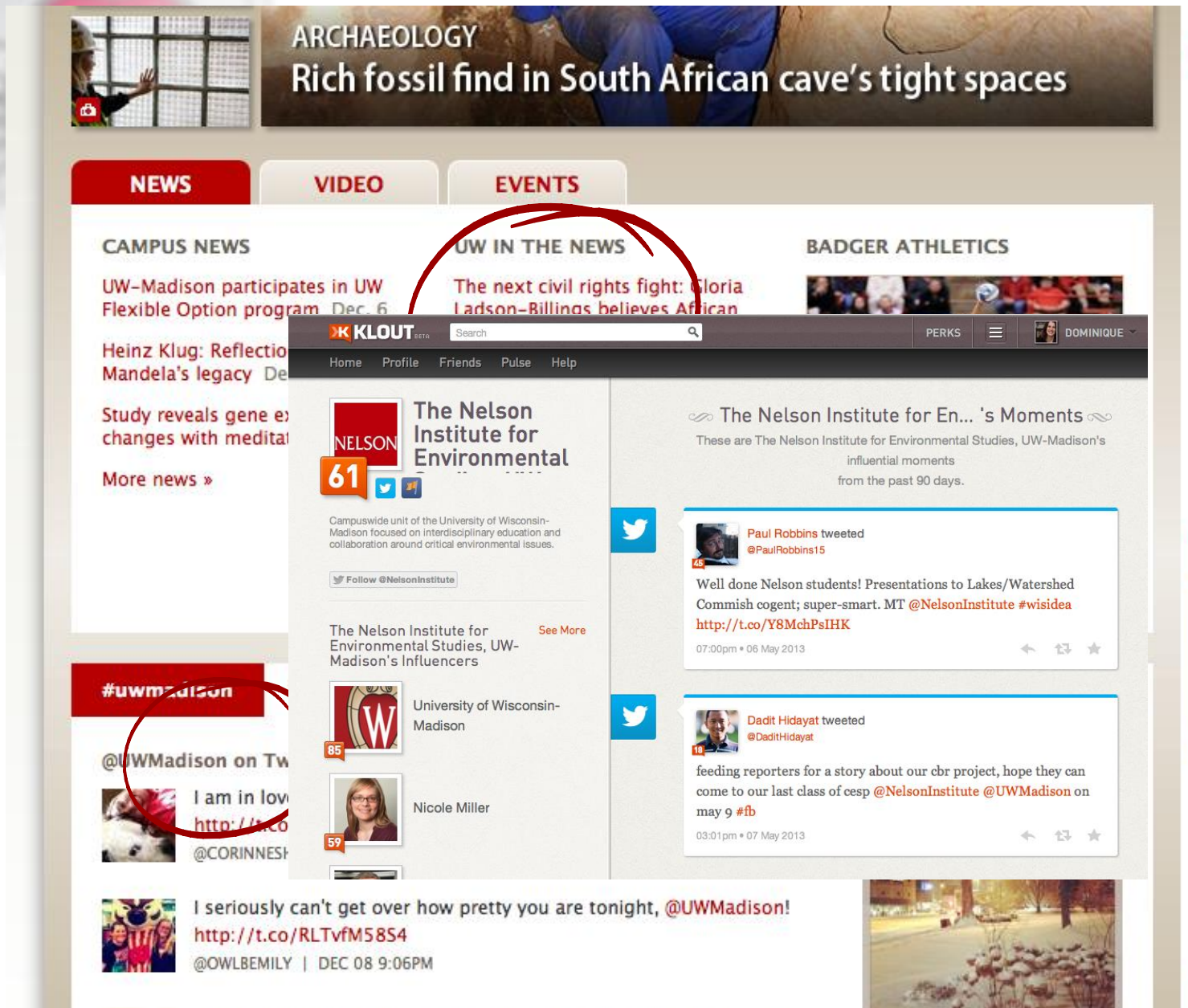


Frequency of Facebook and Twitter Use For Science Related Purposes

	Facebook (N = 143)		Twitter (N = 143)	
	Zero-order	β	Zero-order	β
Block 1: Individual characteristics				
Gender (female)	.06	.03	.00	-.02
Age	-.03	-.01	-.21***	-.12
Discipline (biological sciences)	-.02	.06	-.16**	-.04
Discipline (physical sciences)	-.06	.04	.03	.09
Political ideology (conservative)	-.22***	-.17*	-.17**	-.12
Incremental R^2 (%)	—	*5.2*		*9.0***
Block 2: Traditional science media use				
Newspapers	-.22***	.14	.13*	-.01
Television	.08	.07	.00	.03
Incremental R^2 (%)	—	*4.0**		*1.5*
Block 3: Attitudes toward personal social media use				
Active use of social media	.29***	.18	.46***	.25**
Passive use of social media	-.16**	-.10	-.29***	-.14*
Incremental R^2 (%)	—	*5.5***		*18.4****
Block 4: Attitudes toward sharing science on social media				
Positive perception of public interest in one's research	.11*	-.05	.31***	.12
Actively seeking new ways to share research	.23***	.09	.42***	.17*
Incremental R^2 (%)		*0.5*		*3.2**
Total R^2 (%)		15.2		32.0

*$p \leq .10$, **$p \leq .05$, ***$p \leq .01$.

Difficult to Generalize These Results …



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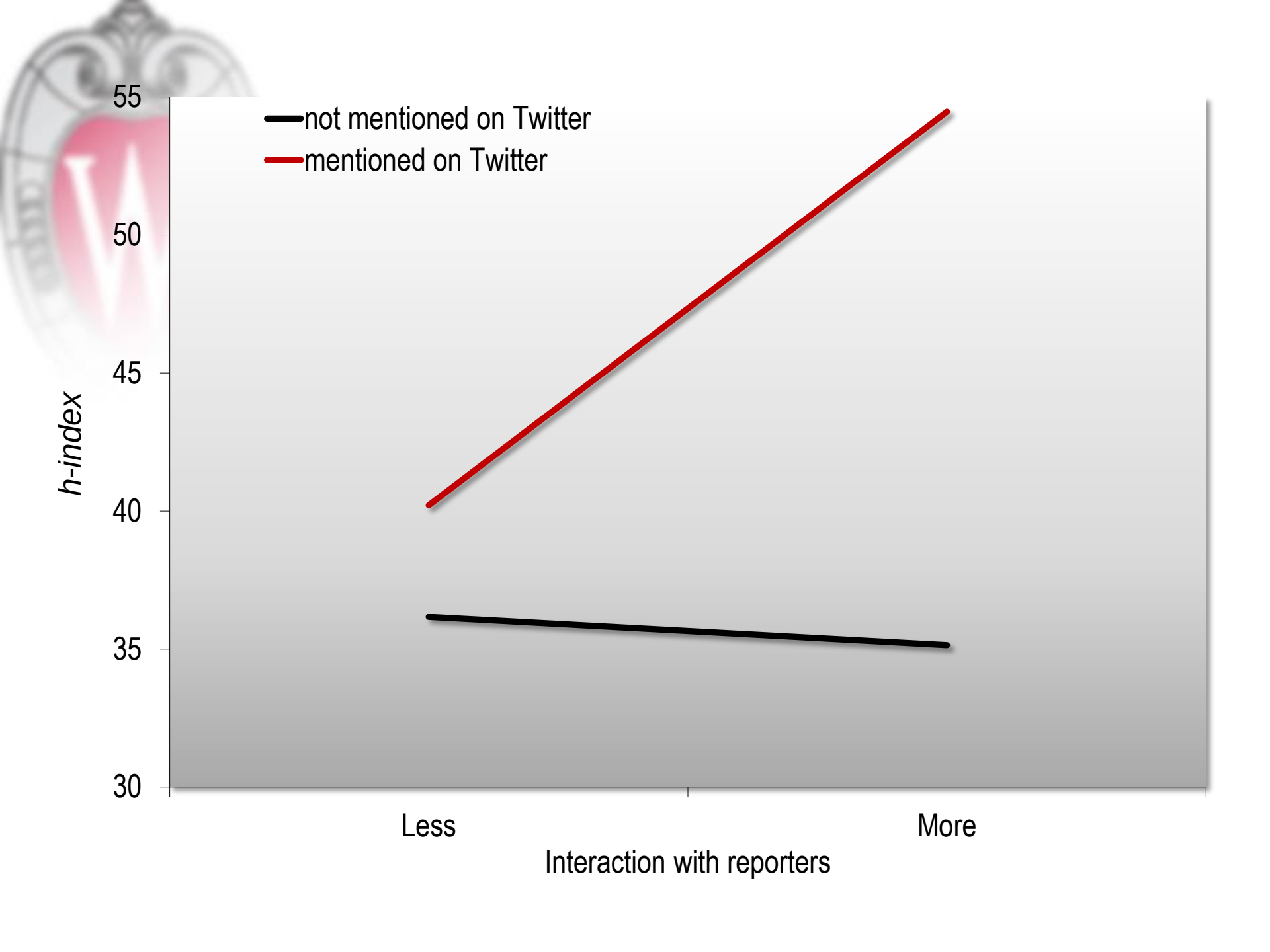
Are Online Buzz and Academic Impact Related?

Liang, X., Su, L. Y.-F., Yeo, S. K., Scheufele, D. A., Brossard, D., Xenos, M., Nealey, P., & Corley, E.A. Building buzz: (Scientists) communicating science in new media environments. *Paper to be presented at the 2014 Convention of PCST, Salvador, Brazil*

	Zero-order	β
Block 1: Demographics & Professional status		
Gender (female=1)	-.08	.03
Scientific age	.70***	.54***
Tenured	.54***	.14*
Block 3: Science Communication		
Interaction with reporters	.34***	.22***
Interaction with nonscientists	.18**	.02
Science blogging	-.03	-.06
Mentioned on Twitter	.23***	.13**
Incremental R^2 (%)		*6.6***
Block 4: Two-way interactions		
Interaction with reporters * Mentioned on Twitter	–	.14**
Interaction with nonscientists * Mentioned on Twitter	–	.11*
Total R^2 (%)[a]		60.7***

PREDICTING *h-INDEX*


55
50
45
40
35
30
h-index
not mentioned on Twitter
mentioned on Twitter
Less
More
Interaction with reporters

Online Buzz and Academic Impact Are Related

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- Twitter can amplify the effect of other types of communication on academic impact

- From an academic visibility standpoint, the essential question is not *whether* scientists should engage with (social) media to communicate their research, but *how* to do so

Concluding Remarks

- Institutional barriers not apparent; training and self efficacy are the main predictors (out of status) of interactions with media
- Change in the cultural outlook toward public communication, particularly in social media settings; scientists actively searching for ways to communicate and discuss their research
- Data needed on main constraints (besides time)

Thank you for your attention

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