A not-quite-random walk to a career in statistics (and podcasting?)

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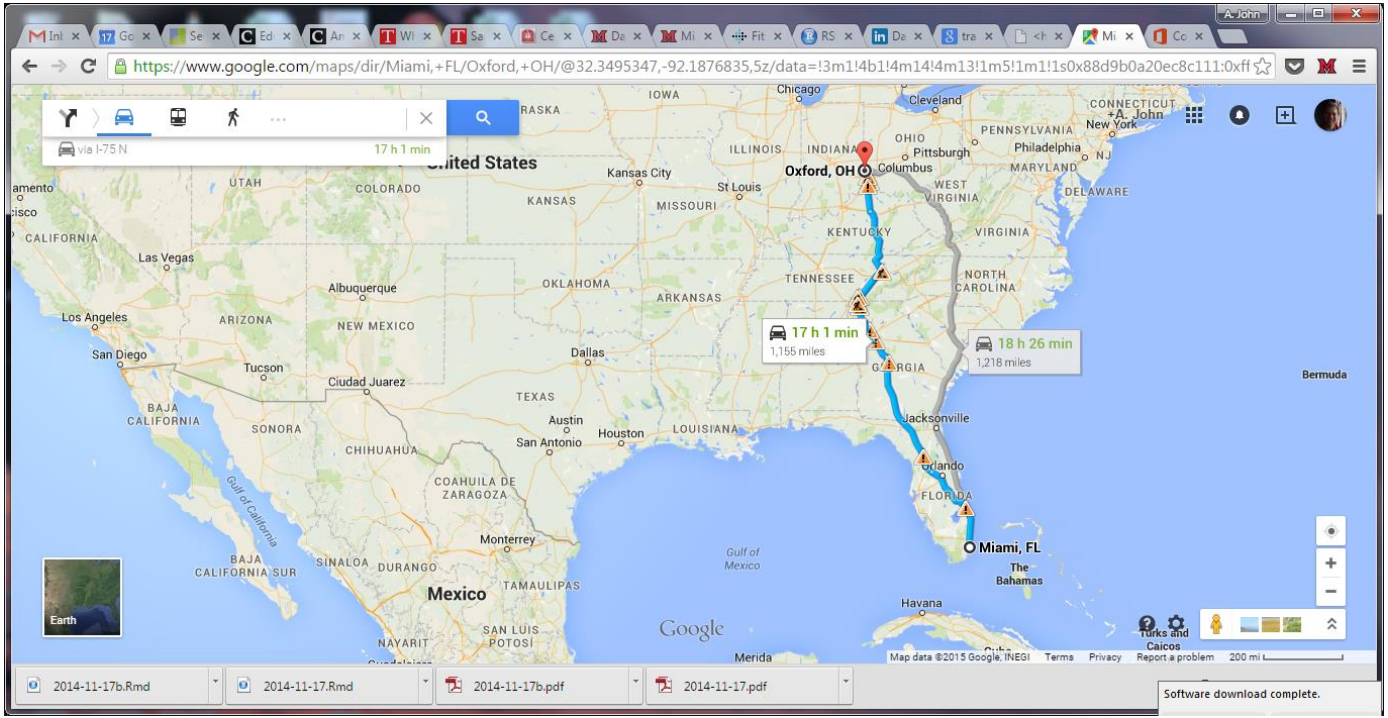
Miami University? Oxford, Ohio?



University of Miami

http://www.contacttopuniversities.com/blog/mainmenu/University%20Articles/top-universities-for-physical-therapy/umEntrance.jpg

Miami University

Outline

1. Career path
2. Collaborations encountered during this path
3. Engaging with the profession
4. Evolution of a podcast
    1. Working with Journalists
    2. Collaborating with Journalists
        a) Teaching together
        b) Partnering on products (podcast for me)
    3. Promoting Connection to Journalism

1. Career Path: Academic Study and Career Timeline

Undergraduate:

- Pre-med => Undecided => Math-Stat + PSY

Graduate:

- MA Quant. Psychology => PhD Biostatistics UNC

Post-Doc:

- Staff Fellow

NIEHS

Landed:

- Assistant – Associate – Full Professor

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1. Career Path: Education / Career Plans

1. Never going to Miami – too close to my high school
2. Going to work in industry – market research
    i. Never going to teach (mom was an elementary school teacher)
    ii. Great experience working with statistical consultant (P&G)
3. Planning for career in government research
4. University teaching position (after never teaching a class in graduate school!)

2. Collaboration Timeline

(dissertation / post-doc – NIEHS collaborators)

Risk estimation / pre-clinical statistics – statisticians, toxicologists

- CJ Portier – n = 12 (first paper together: 1987; last paper together: 2004)
- WW Piegorsch – n = 15 (1st: 1989; last: 2019, 1 in progress!) – includes 2 books

(NIOSH collaboration 1991 start)

Occupational risk assessment – epidemiologists, toxicologists, statisticians, industrial hygienists, occupational physicians

- L Stayner- n=18 peer-reviewed (1st: 1993, last: 2009)
- D. Dankovic, R. Smith, E. Kuempel
- Former students: S. Gilbert, J. Bena, M. Wheeler

2. Collaboration Timeline – Miami 1988+

- Environmental toxicology, ecology, genetics, neurobiology - 1991+
  - JT Oris - n=22 peer-reviewed + 10 chapters (1st: 1993, last: 2014)
- Sports – 2005+ (shuffleboard tournaments, no-hitter case-control study, EPL team rankings) Student-motivated projects
- Gerontology – 2005+ -Sample size planning for gerontology /NH studies, nursing home quality, NH resident assessments, NH worker injuries, withdrawals from NH, fall risk prediction,
- Journalism – 2008+ - Podcast in 2013; Current book project – Statistics Behind the Headlines
- Others? Statistical programming books – developed from course notes
  - Teaching stat (content audit p-value principles, online courses / proctoring, capstone consulting classes), Online therapy, botany

2. Research Recap

Research Interests (ORCID: https://orcid.org/0000-0002-7233-1461):

- Quantitative risk estimation
- Design and analysis of environmental toxicology studies
- Design and analysis of occupational health studies
- Gerontological data analysis
- Promoting quantitative literacy
- Enhancing connections between statistics and journalism

Home department: Statistics
Affiliate member: Departments of Biology, Media Journalism and Film, Sociology and Gerontology and the Institute for the Environment and Sustainability

2. Collaboration Timeline – Miami Collaborators

Students (not STA)

- S. Fore, M. Schlueter, L. Barghusen, Y. Duan, S. Walker, E. Cho, A. Bartuszevige, I.M. Nelson, B. Sigal, T. Yamashita, D.J. Reynolds

Student (STA)

- M. Anderson, S. Gilbert*, K. Venis, S. Liu, M.L. Smith, R. T. Elmore, B. J. Shumate, J. Bena*, M. Wheeler**, S. Greven, J. Craft, G. Cooper, B. Bell, H. Charway, W. Fadel, S. Anderson, D. McCarthy, H. Jeon, J. Wu, J. Webb, C. Heard, T. Cole, A. Tuiyott, B. Clements

Faculty (not STA)

- J. Oris*, S. Guttman, D. Claussen, J. Straker, H. Alessio

Faculty (STA)

- K. See, R. Davis, M. Hughes, R. Schaefer, R. Noble, S. Wright, D. Noe, D. Groggel, J. Zhang, B. Smucker, T. Fisher, K. Maurer, L. Hudiburgh, L. Werwinski

3. Engaging with the profession

My undergraduate professor told me to join ASA AMERICAN STATISTICAL ASSOCIATION Promoting the Practice and Profession of Statistics

Since very involved in biostat-related work, later joined IBS ENAR

And was involved risk and environmentnal toxicology work SRA Society for Risk Analysis SETAC

With international and broader scientific interests reflected in later affiliations

•Inspiration to join? Community, connection, network

ISI International Statistical Institute

AAAS AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

3. Engaging with the profession – giving back

Decade	Society	Activity
90s	ASA	Cincinnati Chapter officer (3yrs)
	ASA	ENVR rep to ENAR program cmt
00s	ASA	ENVR Publications chair
	ASA	RISK chair
	ENAR	Program Chair (05)
	ENAR	RECOM (06-08)
	ISI	Council (09-13)
10s	ASA	Board of Directors (11-13)
	ASA	Accreditation cmt + workgroups
	ISI	VP - Exec Cmt (13-17) President-Elect/President (17-21)

4.1. EvoluatioWorking with Journalists

"The job of the journalist is to make the significant interesting." - Bill Kovach and Tom Rosenstiel's *The Elements of Journalism*.

Nick Kristoff: Reporters should not lead their reports with a lot of numbers and data but rather tell a story that grabs the reader and illustrates the big data to come later in the story. (From R. Campbell)

Journalists are supposed to put facts into context [and this] is the foundation of my work as a reporter and my work in the classroom as I teach journalism students how to write news. (R. Pennington)

What is the job of the statistician?

4.1. Working with Journalists – statistician's job?

What is the job of the statistician?

To conduct and to communicate the results of analyses to have impact.

"Grabbing the reader [audience]" - making the "significant interesting" – "putting facts in context" all seem like important for producing effective and impactful analyses

How often do we think about this?

4.1 Working with Journalists – News & Numbers

My early conversion to thinking about journalism – Cohn and Cope *News & Numbers* – classic book for journalists.

Included questions journalists should ask about research AND statisticians should be ready to answer!

When teaching a graduate course for non-statistics majors many years ago, I started to include questions inspired by *News & Numbers*

4.1 Working with Journalists – journalistic challenge?

Example Questions (from Chapter - *Testing the Evidence*):

- How do you know?
- Have claims been subjected to any studies or experiments?
- If studies have been done, were they acceptable ones, by general agreement?
- Results fairly consistent with those from related studies, and with general knowledge in the field?
- Finding resulted in a consensus among other experts in the filed?
- Conclusions backed by believable statistical evidence? Degree of certainty or uncertainty?
- Reasonable theoretical plausibility to the findings?

4.2. Collaborating with Journalists - Teaching together

- 2009 – challenged to develop a Quantitative Literacy class for humanities studies at my university
- Paired with director of the journalism program, Richard Campbell
- Developed and team-taught a class “News & Numbers” (title no accident!)

4.2. Collaborating w/ Journalists-Teaching together-SLOs

1. Critically assessing assertions
   - Students should be able to incorporate quantitative measures of uncertainty in understanding assertions, such as those found in popular media.
2. Communicating with quantitative concepts
   - Students should be able to interpret graphs and multiple visual displays of information and data.
   - Students should be able to communicate quantitative information in written or graphical forms.
3. Qualitative dimensions of inquiry
   - Students should have strategies for making decisions in the face of uncertainty and incomplete data.
   - Students should be able to write narratives interpreting quantitative data and their meaning.

4.2. Collaborating w/ Journalists-Teaching together-SLOs

Cohn V. and Cope L. (2001) *News and Numbers*. 2nd edition. Blackwell Publishing Professional: Ames, Iowa.

[Best] Best J. (2008) *Stat-Spotting: A Field Guide to Identifying Dubious Data*. University of California Press: Berkeley, CA

- Provided framework for students to build portfolio of *dubious data* and how they would fix these reports
- Other assignments: write story lead (lede) for visitor, generate alternate graphic display, produce 2 paragraph story for AJPH paper
- Aside: This was my first time team-teaching a class and it remains one of my favorite teaching experiences

4.2. Collaborating w/ Journalists-Podcast partnership

- Not possible to continue with team-teaching News & Numbers class BUT we wanted to continue our stat-journalism collaboration
- Desire: help broader community understanding the statistical aspects of complicated stories
- Mechanism / Mode? podcast
- Intended audience? Journalists, statisticians, general public, students, teachers (of introductory statistics and more!)
- Inspirations? Freakonomics (economist + writer), Science Friday, NPR Car talk {Aspirational goal: syndication? }
- Model? Nightline (3-5 minute introduction followed by conversation)

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4.2. Early Decisions– live guests in studio …

4.2. Early review and need to change …

Feb 2013 - First guest Tommy Wright (Census) invited + show recorded.
Used scripted program notes.

March 2013 – Sent out program for comments …

[+] nice idea / Bob's voice / person-on-the-street

[-] too long to get to interview / tech jargon /

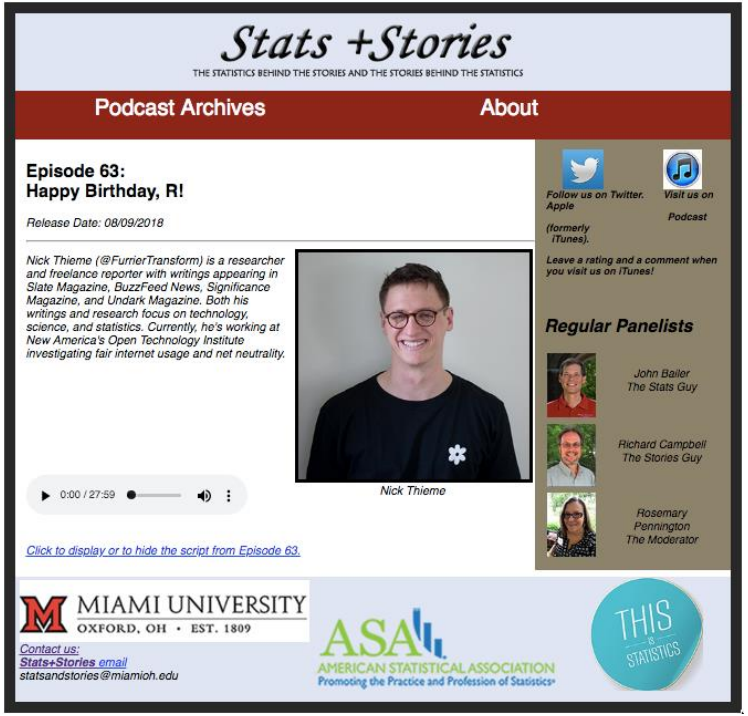
comments-responses <1.5min ['ear fatigue']

Suggestions:

Point person to coordinate flow of conversation & challenge jargon

Lots of editing of current program + modifications for next recording
Mar 2013 – Jim Albert recording

4.2 Going live! (2013-middle of 2018)



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4.2 Evolution– to present form

Partnership with ASA begins! – ASA President Barry Nussbaum initiative
Benefits:

- Budget for transcriptions + Hiring part-time producer!
- Connection with speakers introduced by a professional society
- Promotion of program by ASA (ISI also promotes!)
- Connection to ASA-RSS *Significance* editor – joint promotion of authors/guests

Challenge:

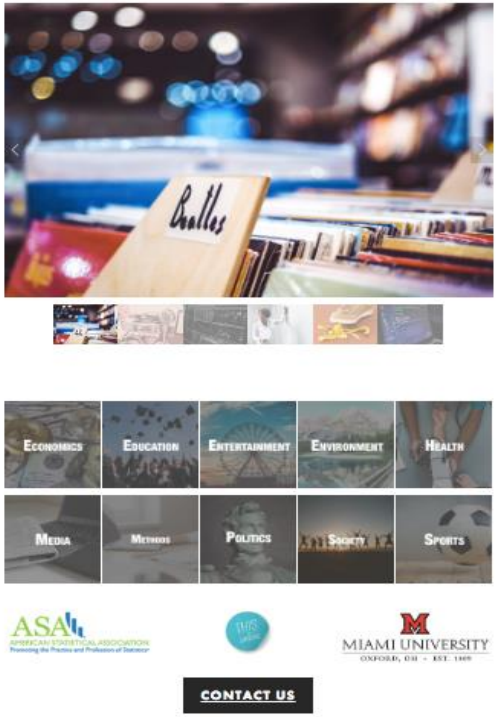
- more frequent and regular release of episodes: move from every 6 weeks to 2 weeks!

Lessons from the professionals? Science Friday visit – regular release and website

4.2 Evolution– to present form

Visit www.statsandstories.net and you wil see:

- A carousel of our latest episodes (images: pexels.com)
- A list of topics that we cover
- A back catalog of all of our previous episodes
- Connection to our Soundcloud and Twitter



4.2 Evolution– (mini) rebranding

We are able to more modernize our output

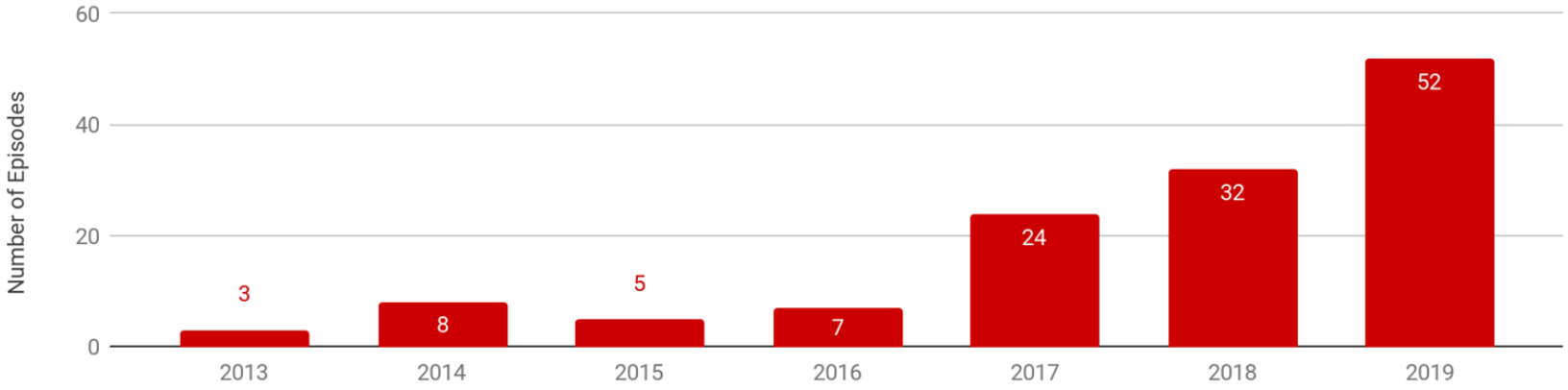
- Changed our logo
- Moved the backlog to SoundCloud
- Using our Twitter account in a more engaging way

4.2 Evolution– changes from start

- New moderator (Bob Long retired) - Welcome Rosemary Pennington (public radio and podcast experience!)
- Partnership with ASA (part of ASA presidential initiatives)
  - Funding to support transcription
  - Increased frequency of program release
    - (S+SS introduced)
  - Promotion (Twitter+)

4.2 Evolution– frequency of episodes

- With more funding and growth we were able to up the amount of episodes and increase both audience participation as well as book more high profile guests



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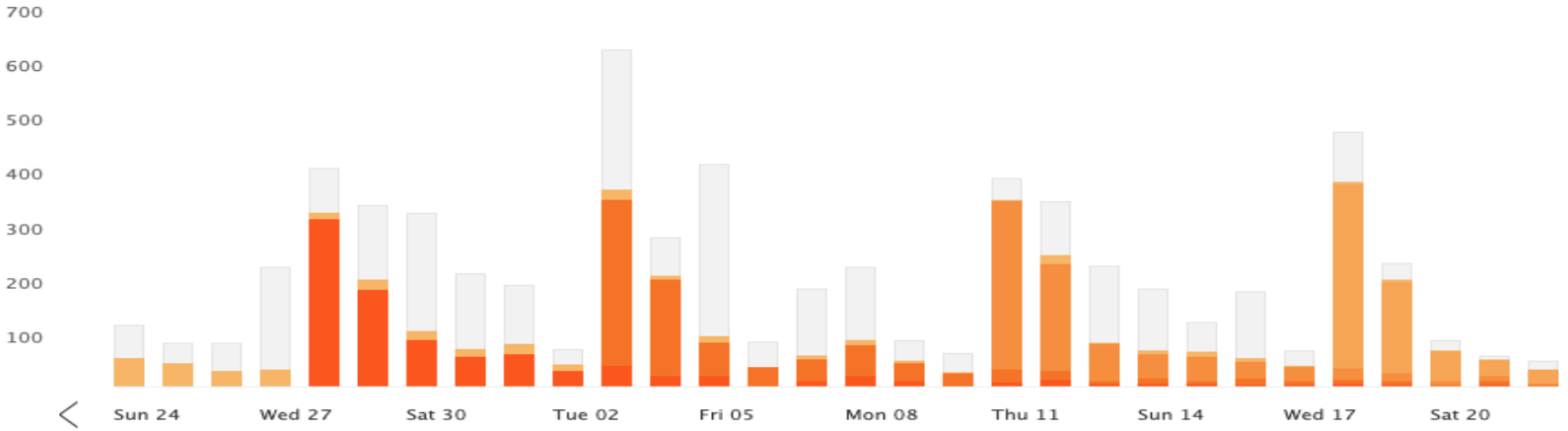
4.2 Evolution– current state

- All guests virtual (audio quality still good – interaction tougher)
- Spring 2020 – everyone recording locally
  - (audacity)
  - Episode 142 Harry Stevens
- Target: One episode per week
- External transcription services and hiring a part-time producer

4.2 Evolution– is anyone listening?

- Since our mini rebrand, we switched to hosting to the podcast on Soundcloud which gives us more data on who is listening
- ASA partnership led to ASA promotion earlier last year, these are our numbers from the past month (orange bars are the most listened to single episode on that day, grey bars are our back catalog on those days)



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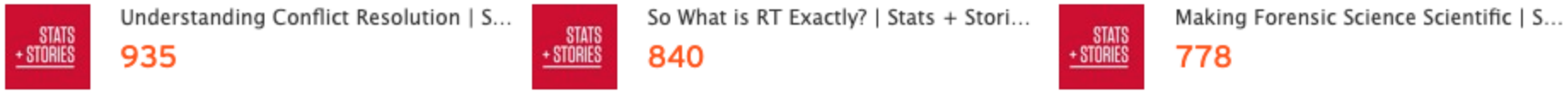
4.2 Evolution– is anyone listening?

Which Episodes Are Doing Well? (count of >2 minutes listening)

- Example: (top row: #89, #90, #91; bottom row: #65, #66, #70)



- All time

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4.2 Evolution– Better Bayes Contest

As a way to increase audience participation we ran contest to explain Bayesian Analysis better

- Ran the competition for a month with a 5% listener response rate
- The episode became our most listened to episode
- Our Twitter followers increased by ~50 percent (from ~420 to >760) – follow @statsandstories now! (now 1500+)

4.2 Evolution– Better Bayes Contest (Headline + lead/lede)

- 44 entries! (a few examples …) – Winner: S. Ziliak (#73)

Headline: You Bet Your Posterior!
Lede: Data may be big, but do they change what we think? Bayesian analysis updates what we know by combining what we knew before with what data reveal.

Headline: Bayes theorem resolves existence of God
Lede: Simply start with your personal beliefs as to whether God exists or not, incorporate all the worldly evidence in favour, and conclude that you were right all along.

Headline: “The future” does not exist
Lede: There is only a known past, and a perpetually evolving and changing present. The trick is realizing that the universe can only make new presents out of the last past.

Headline: From book-cover clues, plotlines construed
Lede: Bayesian analysis tells us you can't always judge a book by its cover, but you can do pretty good if you're reasonably well read.

Headline: Bayesian Analysis Means Counting Possibilities
Lede: How compatible are different ideas with data? Count the ways the data could occur, according to each idea. Ideas with more ways to produce the data are more plausible.

4.2 Winner– Better Bayes Contest

- Haiku! Winner: S. Ziliak (#73). Better Bayes, found in linked haiku.

Bayesian method- Making stuff you partly know Link that with what you don't.

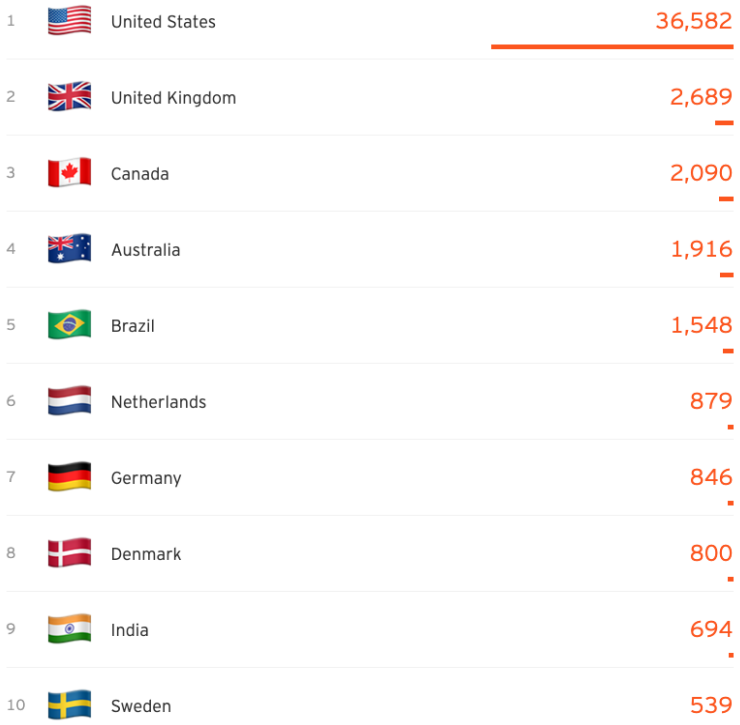
Frequentist methods Fear the null hypothesis and large p-values

"It pays to go Bayes" Epistemologically Obvious in prior.

4.2 Evolution– is anyone listening?

Listened to in 148 countries (from Soundcloud – since episode #64).

Here's a quick look at the top ten countries that are listening to Stats and Stories



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4.2 Podcast - Future

- Context:
  - Climate where opinion viewed as fact ... Echo chamber of news sourcing ... Addressing assertions of Fake news
- S+S Short term:
  - Revenue to support Full-time producer – corporate sponsors?
  - Next listener competition?
  - Continue *Significance* (ASA/RSS features) + #IYWSDS episodes
  - Be current and relevant (also long term goal)
- S+S Long term
  - Expanding the reach of S+S – syndication with NPR
  - Partnering with other efforts – Knight proposal *Report for America*

4.3 Promoting Connection to Journalism

- Lessons learned as a statistician collaborating with journalists
  1. Narrative and story inspires and engages – data can't be the lead – numbers are "plot elements"
  2. Statistical tasks are similar to the tasks of journalist – engage readers, make significant interesting, provide context

Closing Thoughts

1. Careers evolve with paths resulting from selections at choice points
2. There isn't a single best career path
3. Collaboration can be a rich source of interesting research and can be a lot of fun
4. Connect to your professional society early and enjoy this community throughout your career
5. Be open to unexpected and unusual opportunities – these might be some of the most fun you will have in your career

Thank you!

John Bailer

Email: baileraj@miamioh.edu
URL:
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