

Gender and Science in the Time of COVID-19

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The background is a dark teal color. It features several decorative elements: a large teal circle in the bottom-left, a medium teal circle in the top-right, a small teal circle in the bottom-right, and a red vertical rectangle in the top-right corner. The text is centered in white.

Use the chat box to ask
questions, comment, or answer
my questions!

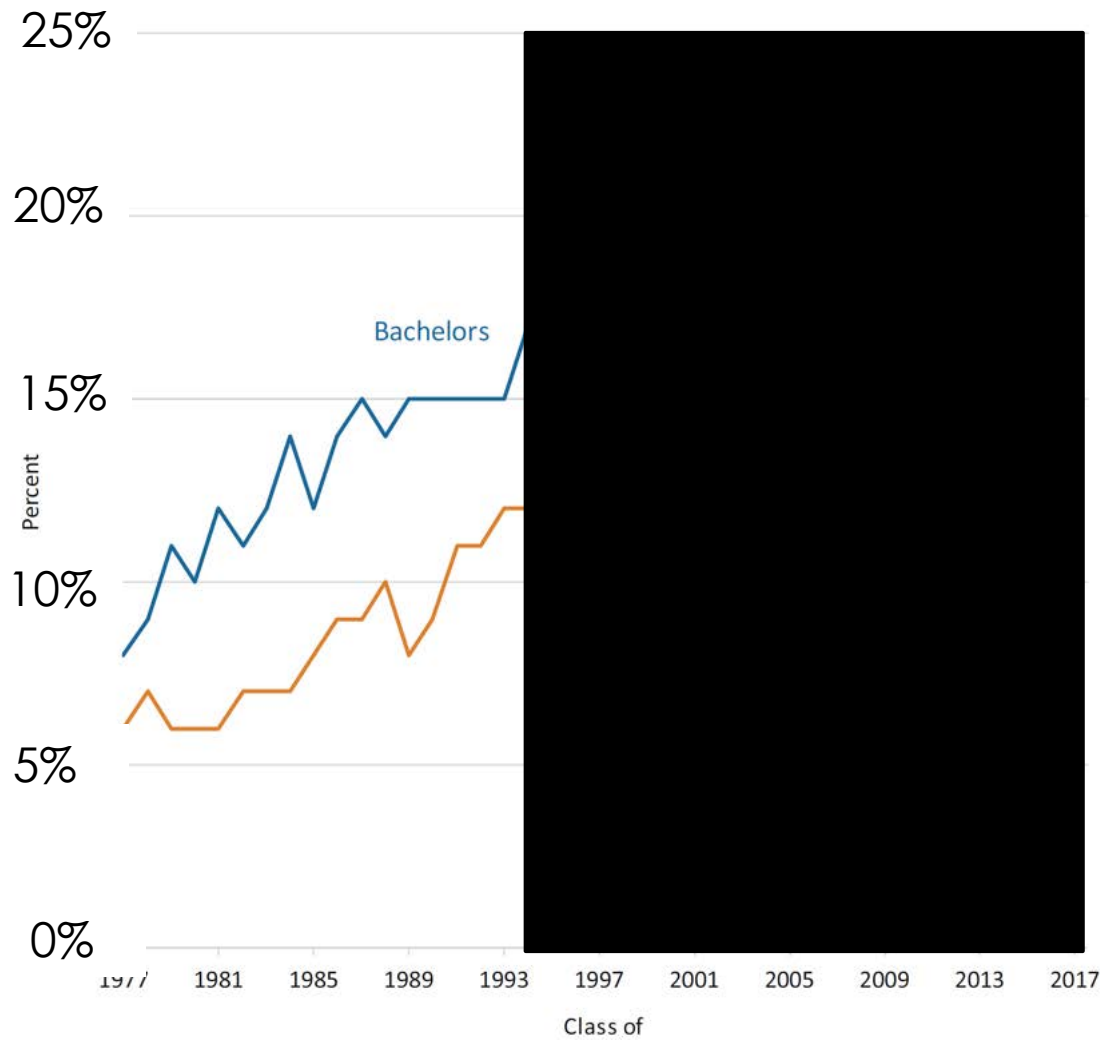
Who the Heck is Laura McCullough?

- ▶ BA in Physics, Hamline University, St. Paul MN
- ▶ MS in Physics, UMN-TC, Minneapolis
- ▶ PhD in Science Education, UMN-TC, Minneapolis

- ▶ Professor of Physics at UW-Stout for 20 years
- ▶ Dad is a PhD physicist, one mom a middle school math teacher, one mom a MS chemist

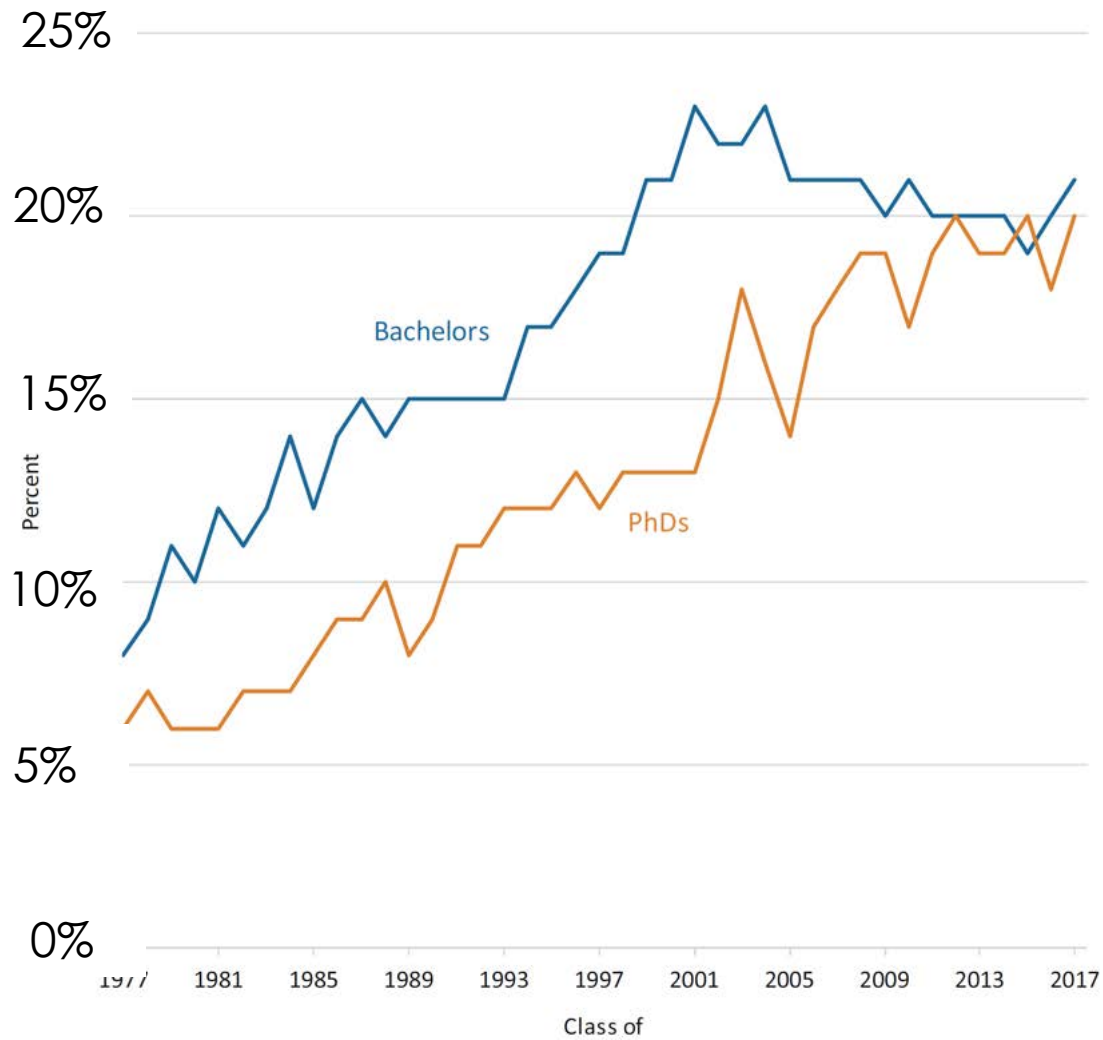
- ▶ Day 1 of physics grad school: WTH?

Percent of Physics Bachelors and PhDs Earned by Women, Classes of 1977 through 2017



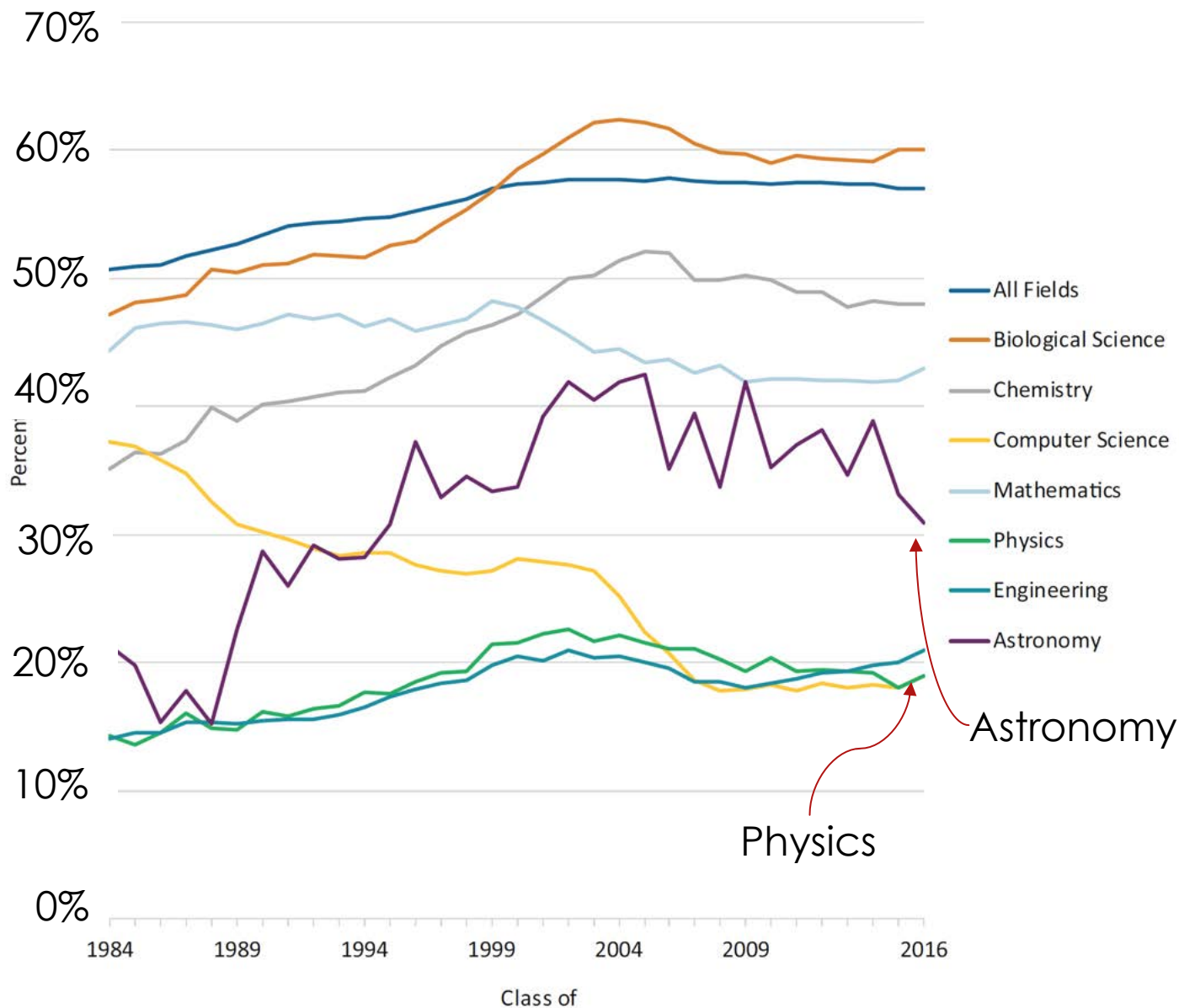
Source: AIP Statistical Research Center, Enrollments and Degrees Survey.

Percent of Physics Bachelors and PhDs Earned by Women, Classes of 1977 through 2017



Source: AIP Statistical Research Center, Enrollments and Degrees Survey.

Percent of Bachelor's Degrees Earned by Women in Selected Fields, Classes of 1981 through 2016



Source: National Center for Education Statistics. Data compiled by AIP Statistical Research Center

Number of African American, Hispanic, and Native American Women Earning Bachelors in Physical Science Fields, 2003 and 2013

	Total Number of Degrees Earned		Degrees Earned by African American, Hispanic, and Native American Women	
	Degrees in 2013 (#)	Change '03-'13 (%)	Degrees in 2013 (#)	Change '03-'13 (%)
Earth Sciences	5,506	64	223	182
Atmospheric Sciences	760	25	19	111
Chemistry	14,886	50	1,307	41
Physics	6,760	59	118	40
Astronomy	413	33	11	-8
Oceanography	247	75	13	333
Other Physical Sciences	812	23	62	138
All Physical Sciences	29,384	53	1,753	54

Poll: why so few women?

- ▶ Which do you think are factors in the low proportion of women in physics?

Factors causing under-representation

- ▶ Culture, not biology!
 - ▶ Harassment (3/4 of undergrad physics women!*)
 - ▶ Lack of role models
 - ▶ Lack of support
 - ▶ Societal messages
 - ▶ Gender bias in general
 - ▶ Microaggressions

*Aycock, Hazari, Brewster, Clancy, Hodapp, Goertzen. PHYSICAL REVIEW PHYSICS EDUCATION RESEARCH 15, 010121 (2019)

Factors continuing under-representation

- ▶ Work-life balance
- ▶ Gender bias in general
- ▶ Microaggressions
- ▶ Lack of support
- ▶ Gendered expectations
- ▶ Tokenism

What helps?

- ▶ Active SPS chapter
- ▶ Student lounge
- ▶ Engaged faculty
- ▶ CUWiP
- ▶ Mentors (peer and other)
- ▶ Bystander intervention training?

Hello, COVID!

- ▶ How has the pandemic alleviated or exacerbated these factors?

- 
- ▶ Poll—what have you encountered so far because of the pandemic?

Women's Stress in COVID

- ▶ Women's stress tends to be higher normally
- ▶ Women have much higher stress loads in COVID
 - ▶ Caregiving
 - ▶ Shift workers
 - ▶ Contract workers

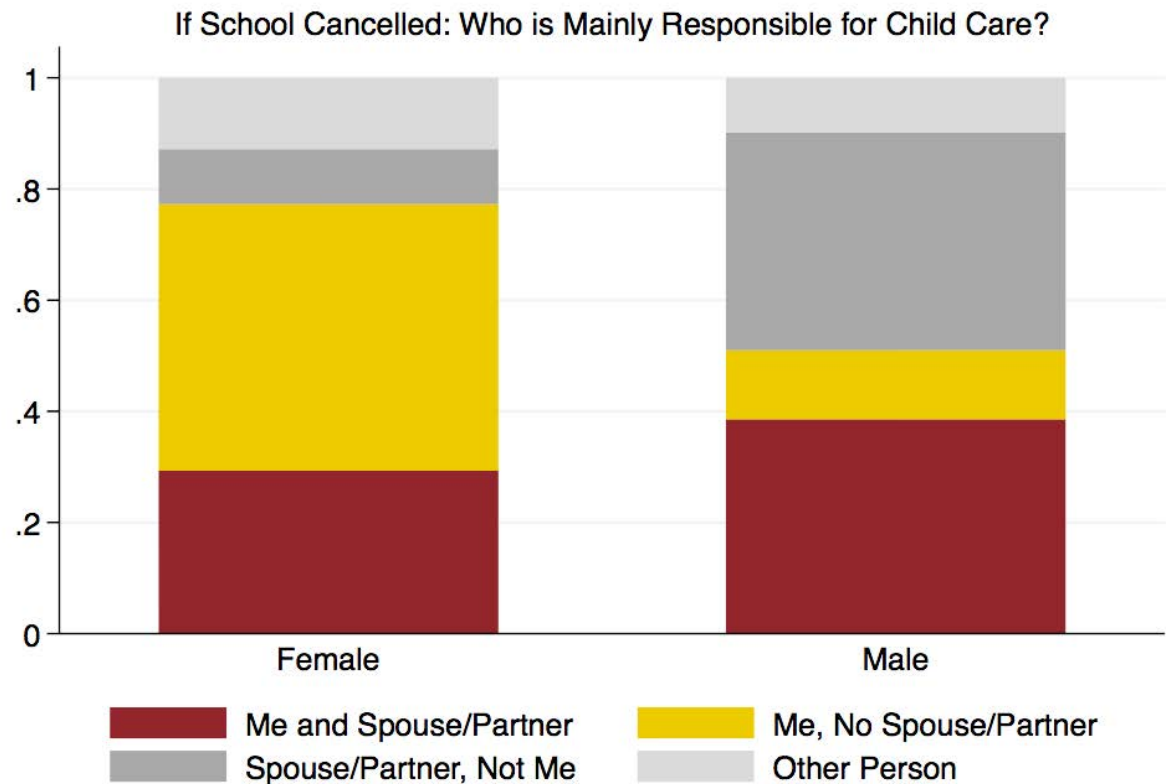
Caregiving and Childcare is a Gendered Burden



Misaligned perceptions: while only **29%** of married women report childcare is shared with a spouse/partner, **39%** of men report the same

Women do more: **49%** of married women report they are mainly responsible, **39%** of men report their wives are mainly responsible

Work is disrupted for all: Roughly **40%** of men and women report work is disrupted due to closure-induced childcare burdens

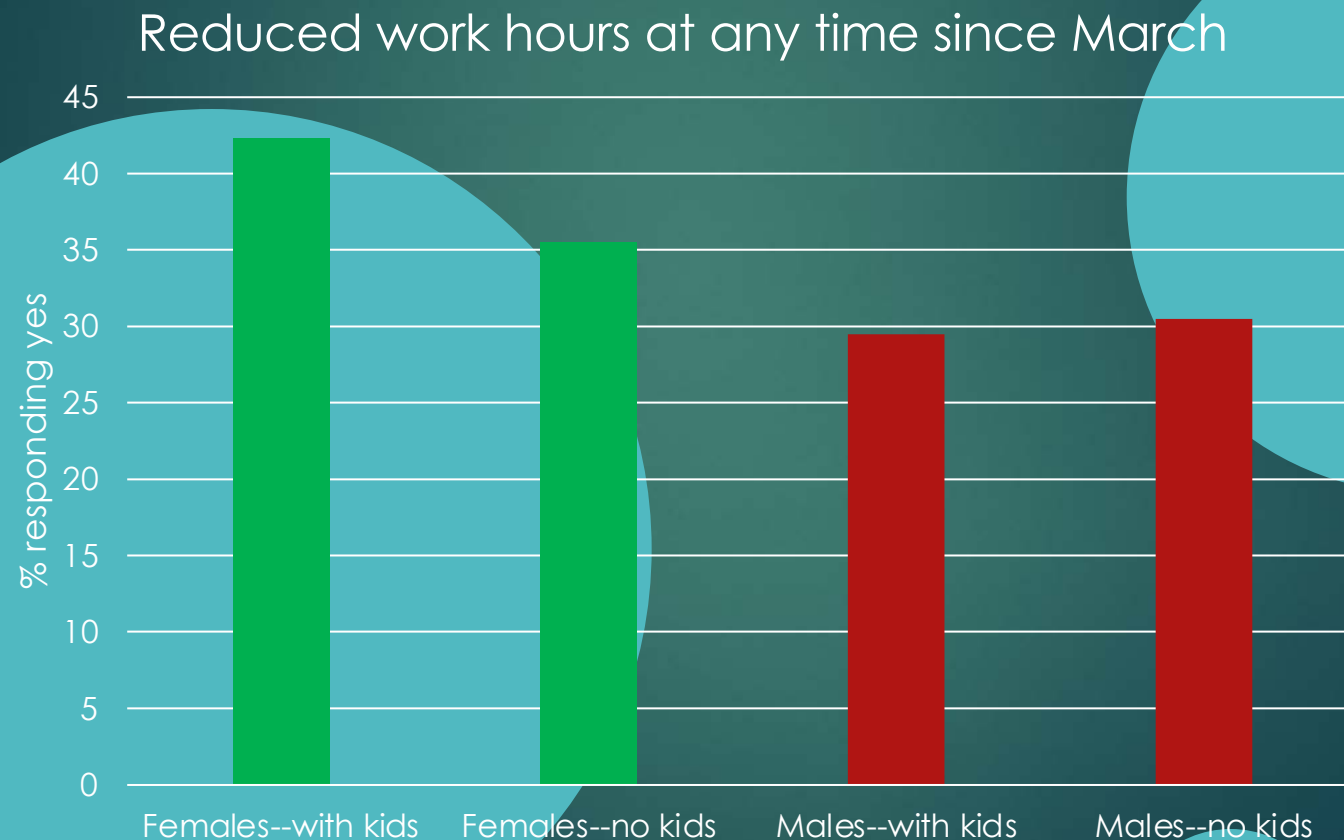


Note: Estimates weighted to be nationally representative. Wave 2, married individuals with coresident spouse only.

Source: USC Center for Economic and Social Research - Coronavirus Tracking Survey Waves 1 & 2. Contact uas-l@usc.edu for more information.

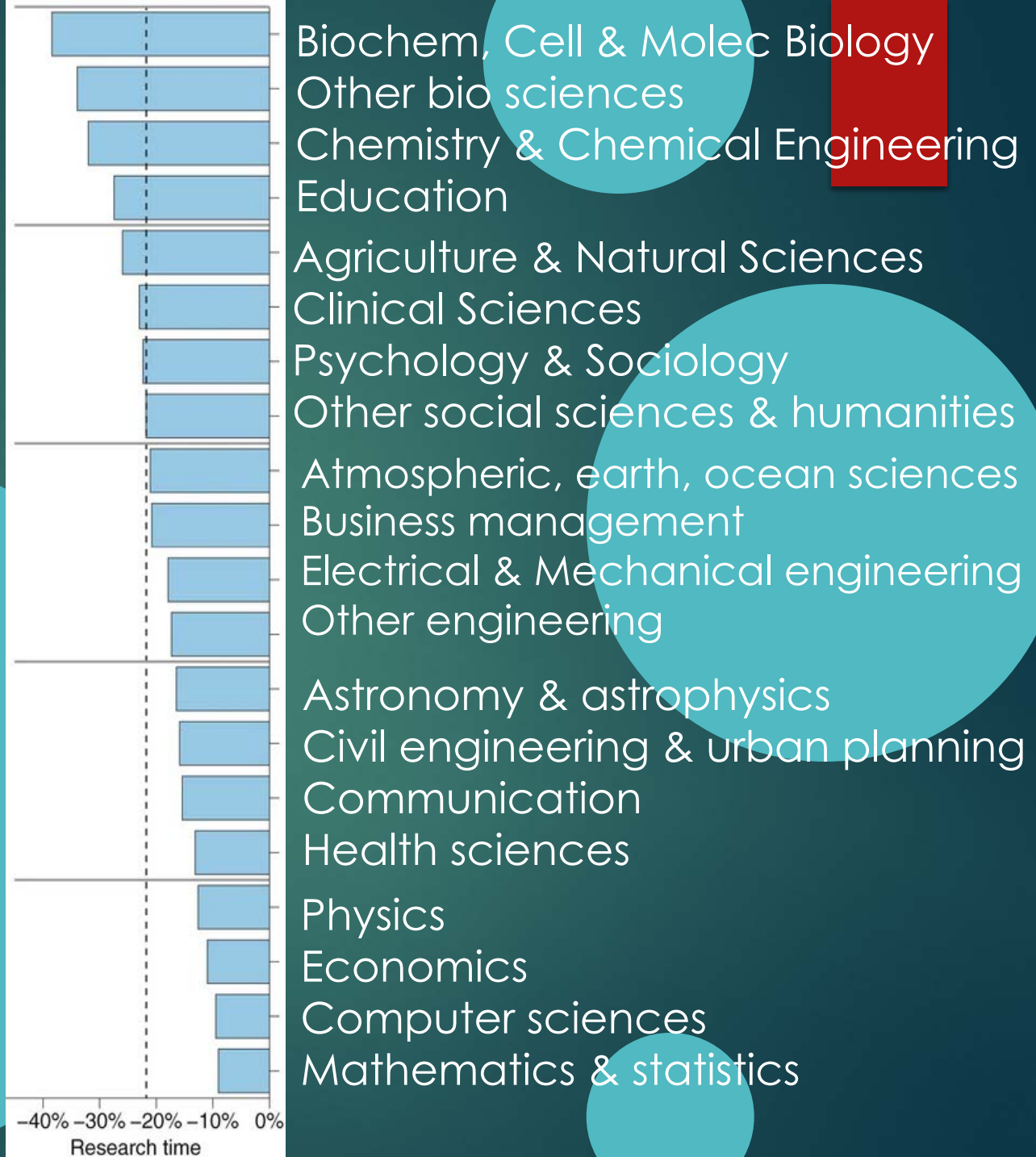
Slide from USC Dornsife: <https://uasdata.usc.edu/index.php>

Female, Kids = reduced work hours



Loss of research time by field (0-40%)

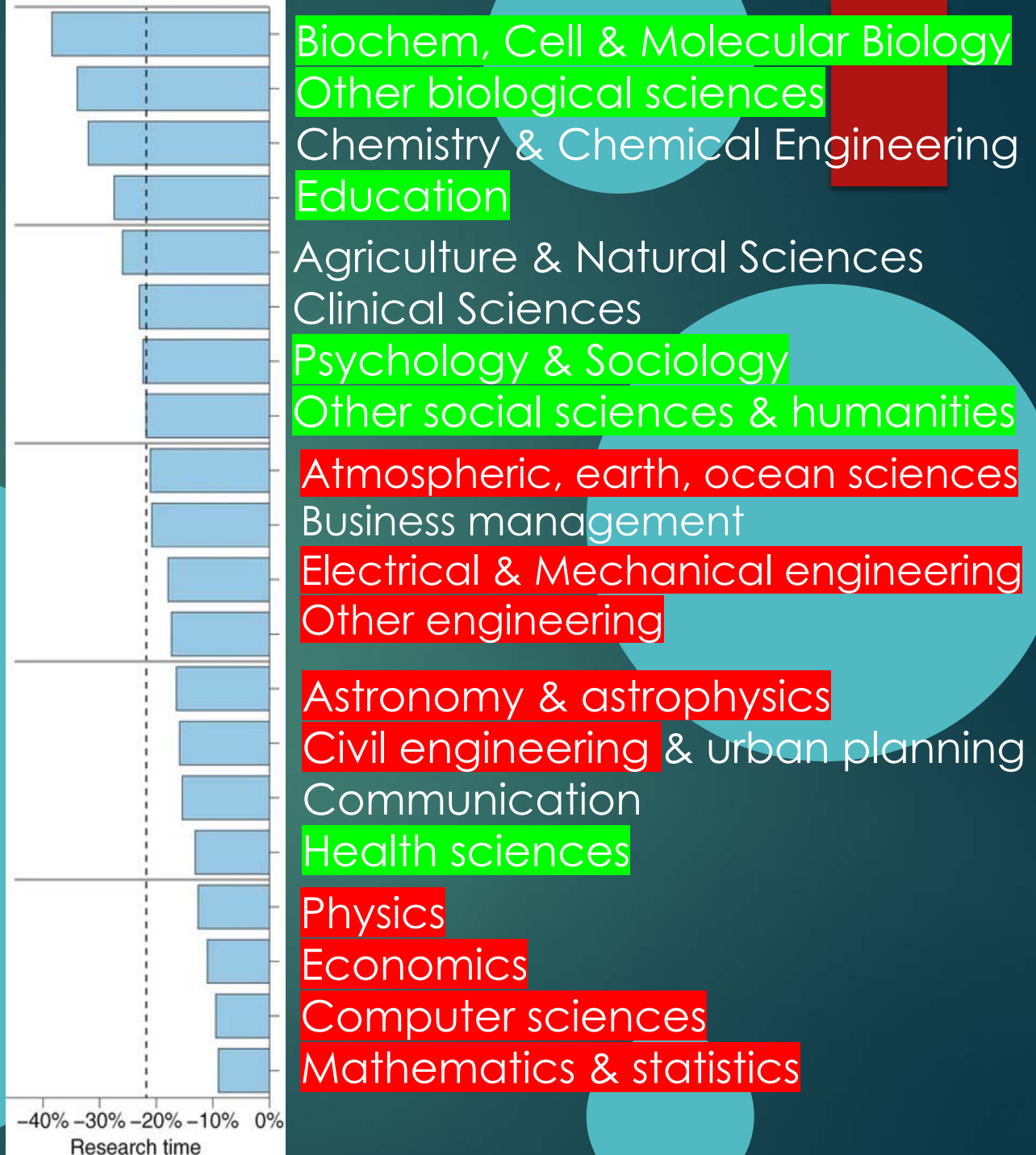
Myers, K.R., Tham, W.Y., Yin, Y. et al. Unequal effects of the COVID-19 pandemic on scientists. Nat Hum Behav 4, 880–883 (2020). <https://doi.org/10.1038/s41562-020-0921-y>



Loss of research time by field and field gender ratio

*denotes male-dominated field

†denotes female-dominated field



Loss of research time

▶ Controlling for other factors:

- ▶ Being female adds 5% loss to research time
- ▶ Having a child under 5 means additional 17% loss
- ▶ Multiple kids: add 3% loss

Publishing

- ▶ Women less likely to publish in early COVID months
- ▶ Women less likely to accept invitations to review

- Squazzoni, Bravo, Grimaldo, Garcia-Costa, Farjam, and Mehmani, Bahar, No Tickets for Women in the COVID-19 Race? A Study on Manuscript Submissions and Reviews in 2347 Elsevier Journals during the Pandemic (October 16, 2020).
- Pinho-Gomes, Peters, Thompson, et al. Where are the women? Gender inequalities in COVID-19 research authorship. *BMJ Global Health* 2020;5:e002922.
- Murić, G., Lerman, K., & Ferrara, E. (2020). COVID-19 amplifies gender disparities in research. *ArXiv*, abs/2006.06142.
- Andersen, Nielsen, Simone, Lewiss, Jagsi. Meta-research: is COVID-19 amplifying the authorship gender gap in the medical literature? *eLife* 2020;9:e58807 doi: 10.7554/eLife.58807

COVID & telecommuting

- ▶ COVID caused huge rise in working from home
- ▶ April: 35% shift to remote work, 15% already doing it

Telecommuting gender gaps

- ▶ Dads less tired at end of TC day than on-site day
- ▶ Moms more tired

Lyttelton, Thomas and Zang, Emma and Musick, Kelly, Gender Differences in Telecommuting and Implications for Inequality at Home and Work (July 8, 2020).

Zoooooooooom!

- ▶ Who talks in meetings?
- ▶ Who gets interrupted?
- How do these change when shifting to videoconferencing?
- ▶ Men & women behave differently if VC partner is male or female, if video on or off
 - ▶ Men more dominant if their body language visible
 - ▶ Women less dominant if BL visible

Teoh, Regenbrecht, O'Hare (2011) The Transmission of Self: Body Language Availability and Gender in Videoconferencing.

Teoh, Regenbrecht, O'Hare (2012) How the Other Sees Us: Perceptions and Control in Videoconferencing

Teaching

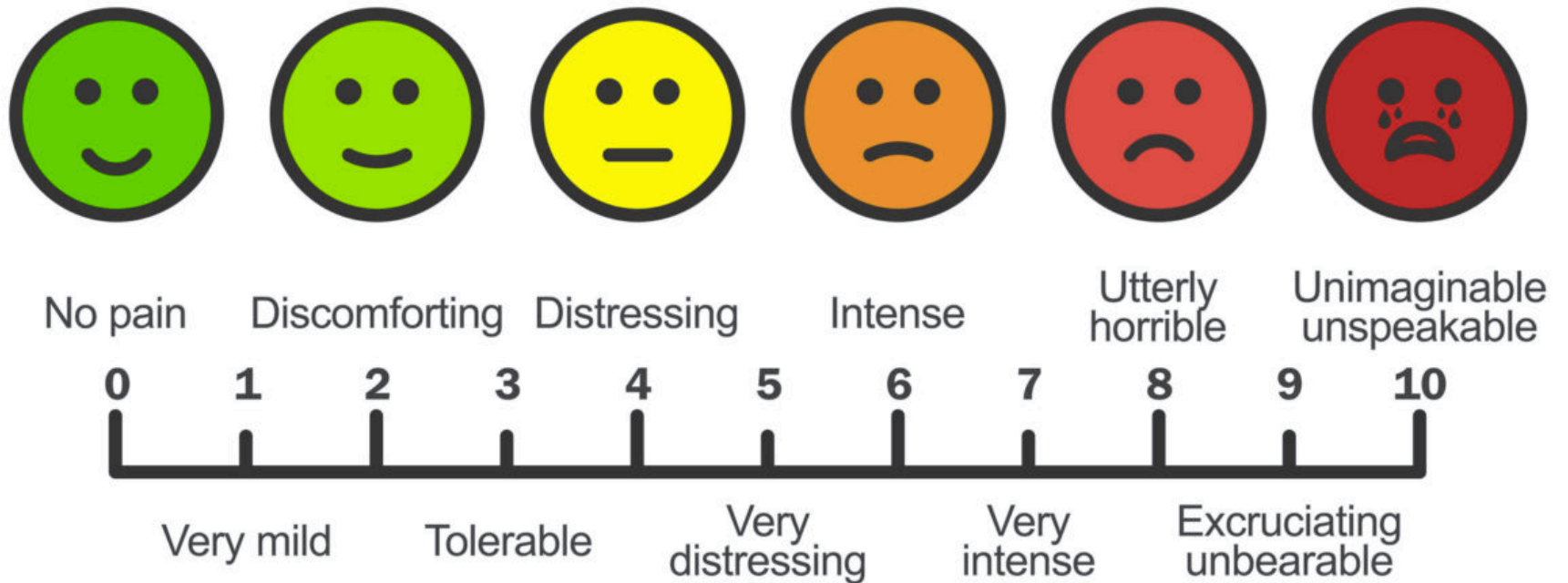
- ▶ Initial evidence that moving to online teaching helped women in STEM
 - ▶ Non-tenure-track and adjunct teachers
- ▶ Women's service load higher normally
- ▶ Heavy burden on women of color, particularly black women
 - ▶ Student emotional support

Mentoring

- ▶ Women in need of mentoring to succeed professionally
- ▶ Many mentoring programs connected to conferences, meetings
- ▶ Need for alternative mentoring processes

Cree-Green, Carreau, Davis, et al. Peer mentoring for professional and personal growth in academic medicine. J Investig Med Epub ahead of print

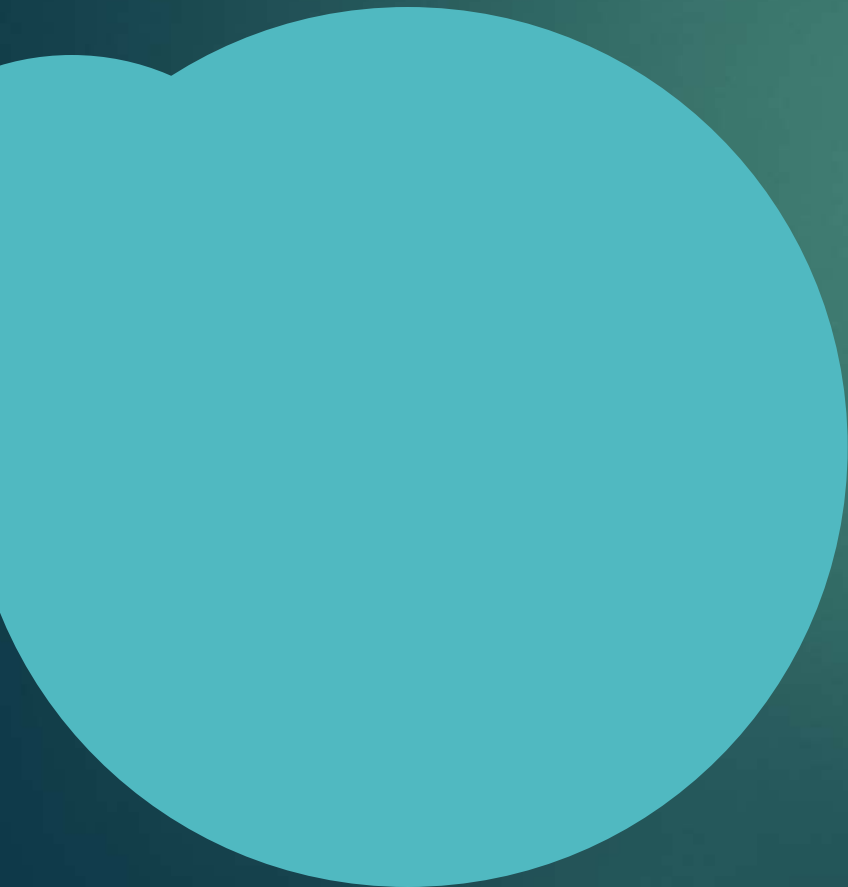
Poll: How bad has COVID been for you?

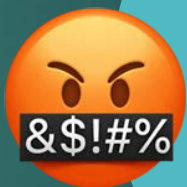


What makes COVID easier? Privilege check

- ▶ White
- ▶ Male
- ▶ Able-bodied
- ▶ Adult
- ▶ Christian
- ▶ Cisgender (not transgender)
- ▶ Heterosexual/straight
- ▶ Middle or upper class
- ▶ Have access to college education
- ▶ Average/moderate weight

Poll: How much privilege
do you have?





What to do?

For others:

- ▶ Patience
- ▶ Benefit of the doubt
- ▶ Golden rule
- ▶ Be especially kind to women, persons of color, LGBTQ+ folks, and other minoritized groups
- ▶ Assume everyone is having a terrible day and treat them kindly

What to do?

For self:

- ▶ Self-care! Exercise, sleep, eat well, limit drugs and alcohol
- ▶ Support group/social group
- ▶ Counseling/therapy
- ▶ Sunshine—10 minutes a day
- ▶ Acts of kindness/compassion

- ▶ Be kind to yourself—you're doing the best you can, and that's enough!

Conclusions

- ▶ The age of COVID sucks
- ▶ It sucks worse for women and minorities
- ▶ Women/minorities in STEM probably have it even worse
- ▶ Have to help each other, support each other
- ▶ Do what you can, don't expect more