

Mental wellbeing in academia



Mental health is defined by WHO as

“...a state of well-being in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community”

And **work related stress** as

“...the response people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope.”

2019 Nature PhD survey

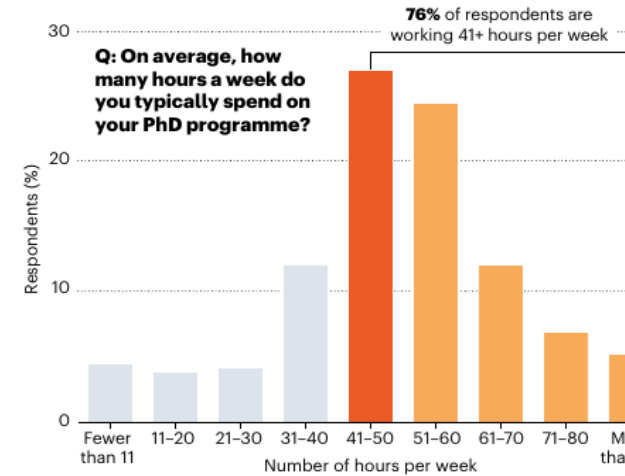
- 6300 respondents: 36% Europe, 27% Asia, 28% North Central America, 9% rest of the world
- Nearly 40% are living out of their home country
- 75% somewhat satisfied, 62% in 2022
 - 45% satisfaction has worsened
- 76% working 41+ hours per week (of whom 85% dissatisfied with their hours)
 - 49% “culture promotes working overtime”
- 43% “mental health services are not suited for PhD students”

OVEREXTENDED AND STRESSED

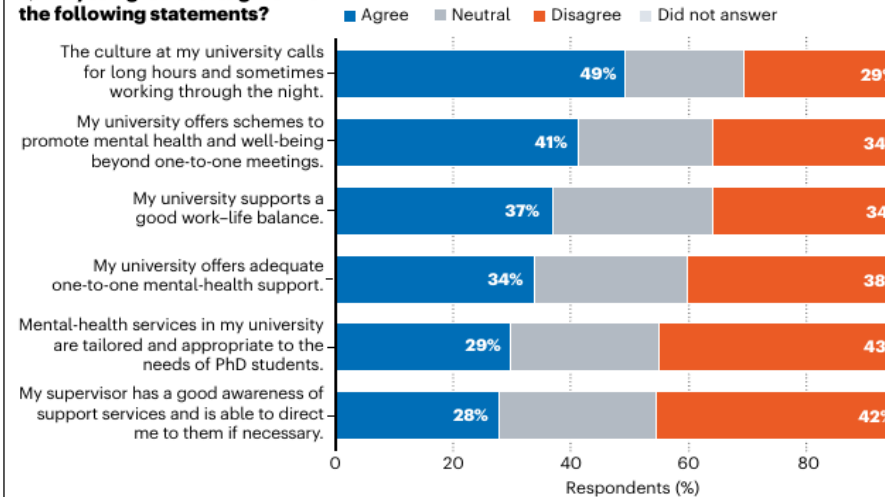
Long hours in the laboratory and other demands have taken a toll on PhD students' well-being and mental health.

36%

of respondents have sought help for anxiety or depression caused by PhD studies. One-third of them sought help from places other than their institution, and 18% sought help at their institution but didn't feel supported.



Q: Do you agree or disagree with the following statements?



Then what are the causes of this distress?

Mainly uncertainty about job prospects, bad work-life balance, economical burden, work achievements

- 40% unsatisfied with balance between work and life, 68% in 2022
- Financial issues greatly varie with region: student debt more significant in Asia and North-Central America. More than half respondents from Africa listed this and research of funding as major concerns.
- 40% “program didn’t meet initial expectations”, 10% “exceeded their expectations” (sharp drop from 23% in 2017)
- Harassment and discrimination: experienced by 21% of respondents. 39% gender discrimination (of whom 85% women), 33% racial. In 2022 46% cases the perpetrator is supervisor

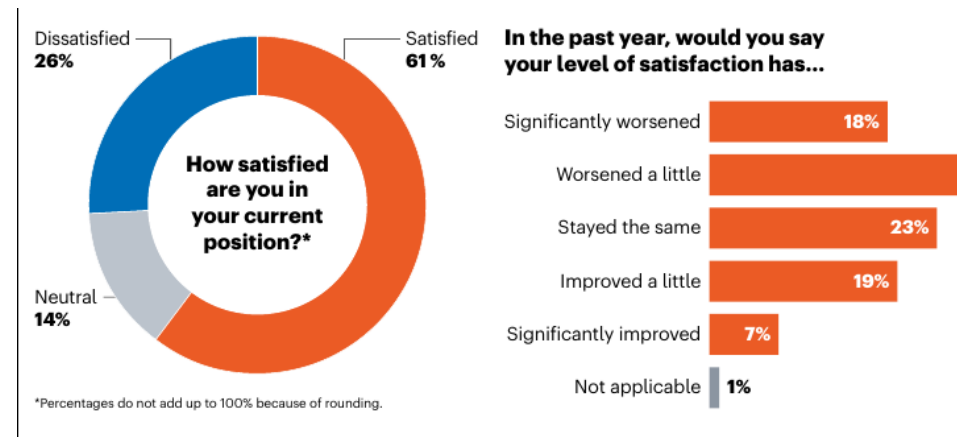
However there is a silver lining...kind of

- (Only) 56% would most like to continue in academia. Not sustainable in some fields, shortage of postdocs.
- 75% satisfied with degree of independence, 67% satisfied of relation with advisor/PI (of whom 27% extremely satisfied)
 - So we continue on and what happens next?

First 2020 Nature Postdoc survey

7600 respondents, 19 disciplines (52% biomedical sciences), 93 countries (61% living outside of home country)

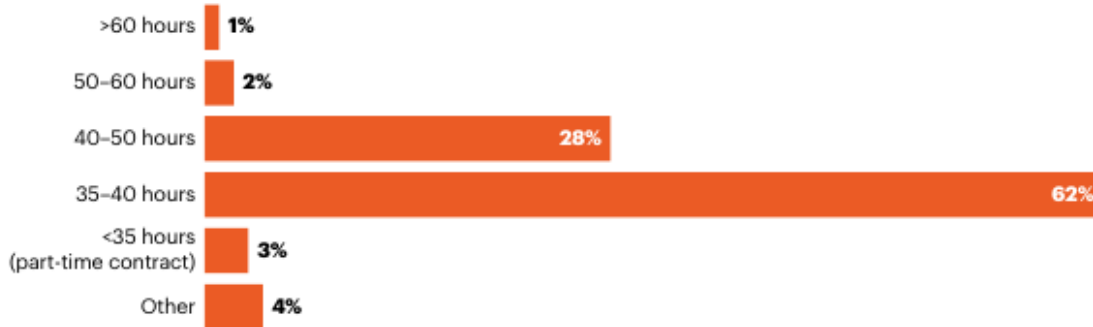
- Highest percentage of satisfaction in ecology and evolution, lowest in physics and biomedical (28% each dissatisfied)
- Age 26-30 highest satisfaction rate 66%, 64% for those being in postdoc for less than 2 years
- 32% "it was worse than expected", 12% "it was better"
- 56% have a negative view of career outlook



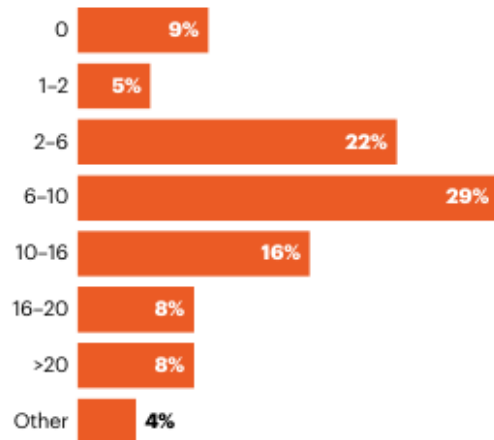
But what is a postdoc, or what *it should be*?

- Postdoctoral role is meant to be temporary: 48% 3 years+, 30% has already completed 2/3 postdocs
- and developmental: 55% spend less than 1 hour a week with PI
- Only 13% directly work for institution and are therefore faculty. 40% funded by external agency, almost 40% funded by PI
- Consequences on intellectual property: only 18% of respondents with own grant said they could take their project with them
- Are excluded from grant applications, PhD supervision, do not enjoy benefits of faculty and staff members.

How many hours a week are you contracted to work?

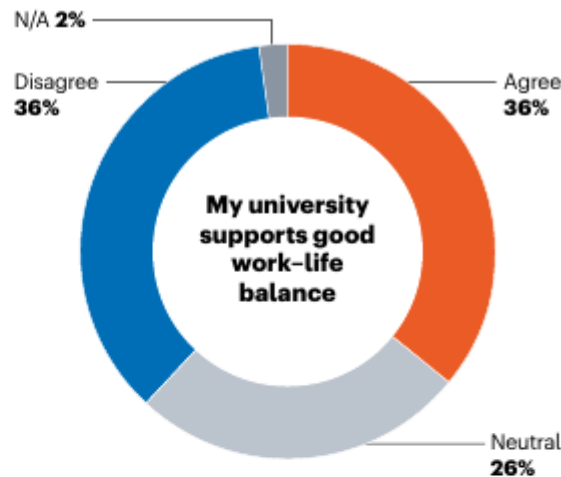
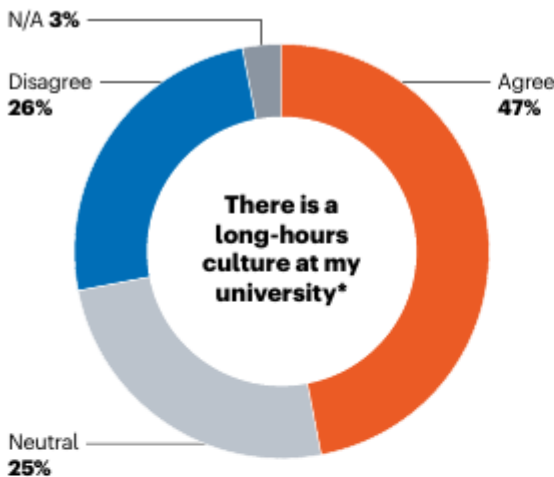


How many hours per week, if any, do you typically work beyond those contracted?*

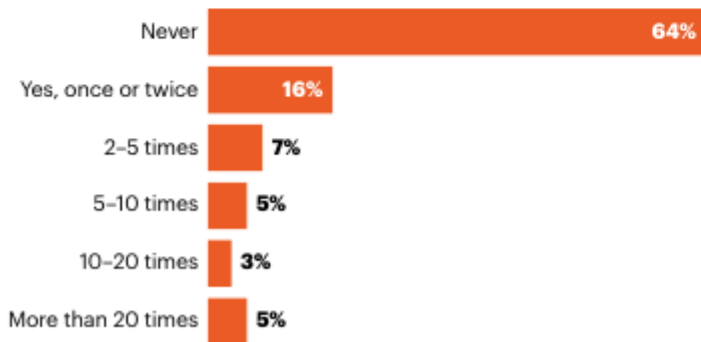


Recurring issues:

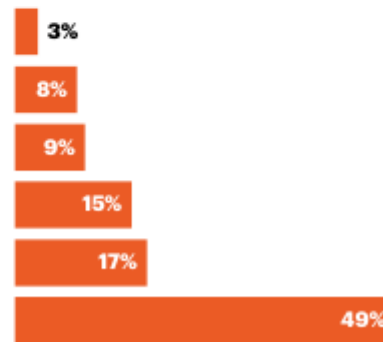
- high pressure: signing waivers to contract to say you will work extra hours
- long hours
- job uncertainty “It’s a time when career uncertainty collides with personal life”



**In the past year, have you ever worked:
...overnight in the lab?**



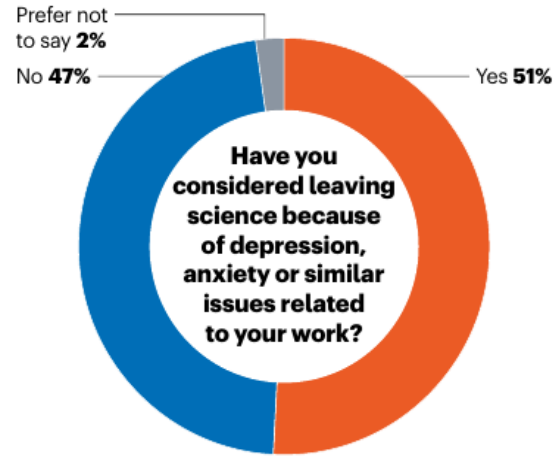
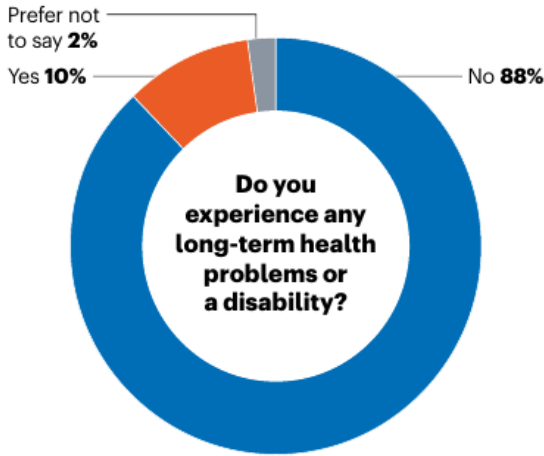
...on weekends or on days off?*



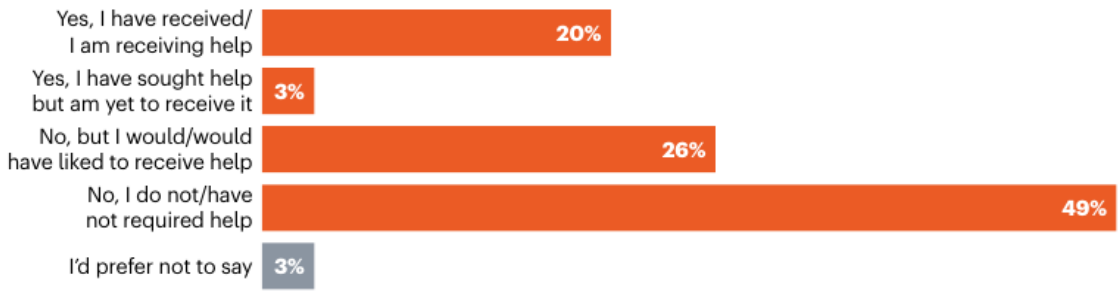
*Percentages do not add up to 100% because of rounding.

49% of people working on weekends and days off has done so at least 20 times

It's positive to be passionate about the job, but do we know when and where to draw the line?



Have you sought or received professional help for depression or anxiety related to your work?*

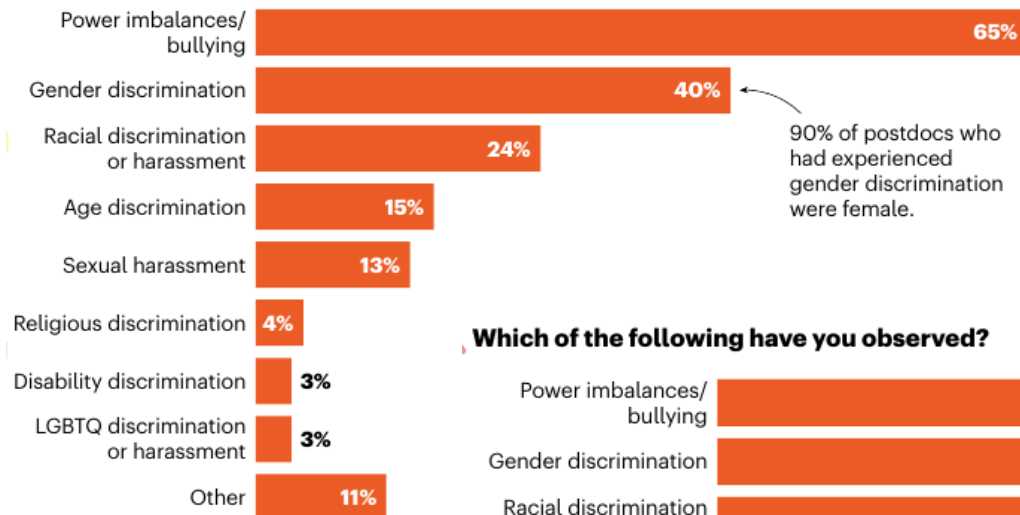


*Figures have been rounded and so do not add up to 100%.

- 55% women considered quitting, 46% men, 66% of those with disabilities
- 4 out of 10 satisfied with balance
- Nearly half of respondents have some issues with depression and anxiety
- Females more likely to have asked for help (27% vs 16%)
- 18% agreed with "mental health and wellbeing services are tailored and appropriate for postdocs"

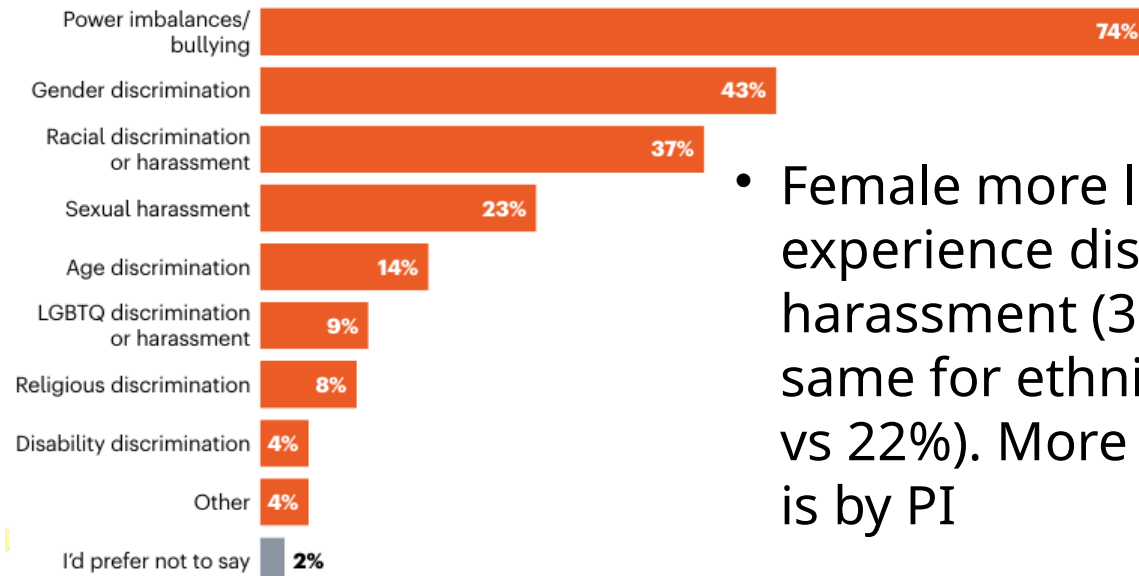
And adding to the scientific pressure

Which of the following have you experienced directly?



90% of postdocs who had experienced gender discrimination were female.

Which of the following have you observed?



- 50% think workplace is doing enough to promote gender equality, only 38% if we replace with racial/ethnic equality (61% white)

- Female more likely than men to experience discrimination or harassment (30% vs 18%) and same for ethnic minorities (34% vs 22%). More than half of time is by PI

Comparison groups

3659 PhD students from Belgium,

3 comparison groups *highly educated in general population, highly educated employees, higher education students*

- 12 items version of General Health Questionnaire
- Strategy: assess whether a mental health problem is present or not, but not the severity (GHQ2+ = respondents presents at least 2 symptoms)
- Central idea: low levels of well-being are not individual symptom but result of imbalance leading to stress
- 52% Female, 28.3 average age, 30% biomedical, 24% social sciences, 19% sciences
- Data for comparison groups from National Health Interview Surveys
- RISK RATIO (RR): ratio between percentage of respondents with a mental health problem in Sample 1 and the corresponding percentage in Sample 2 (adjusted RR corrects for age and gender differences)

Table 4

Prevalence of common mental health problems in PhD students compared to three comparison groups, Flanders, 2013: %, risk ratio adjusted for age and gender (RR), confidence interval (CI).

Source Year of survey	PhD students	Comparison group 1: Highly educated general population			Comparison group 2: Highly educated employees			Comparison group 3: Higher education students		
	SJR 2013 N = 3659	HIS 2013 N = 769 ^a			HIS 2013 N = 592			HIS 2001, 2004, 2008, 2013 N = 333 ^b		
	%	%	RR	CI	%	RR	CI	%	RR	CI
Felt under constant strain	40.81	27.47	1.38	(1.18–1.62)	26.69	1.43	(1.20–1.70)	30.21	1.16	(0.96–1.42)
Unhappy and depressed	30.30	13.60	2.09	(1.65–2.65)	12.31	2.22	(1.70–2.91)	18.48	1.42	(1.09–1.84)
Lost sleep over worry	28.33	18.13	1.62	(1.32–2.01)	17.16	1.70	(1.35–2.15)	18.13	1.35	(1.03–1.77)
Could not overcome difficulties	26.11	12.00	2.36	(1.82–3.06)	10.57	2.71	(2.01–3.64)	12.69	1.85	(1.35–2.54)
Not enjoying day-to-day activities	25.41	13.07	2.21	(1.74–2.82)	12.31	2.39	(1.82–3.13)	10.88	1.68	(1.19–2.38)
Lost confidence in self	24.35	7.95	3.48	(2.52–4.79)	7.56	3.54	(2.47–5.06)	10.24	2.04	(1.43–2.91)
Not playing a useful role	22.46	9.20	2.33	(1.73–3.15)	8.15	2.54	(1.80–3.59)	10.88	1.78	(1.26–2.53)
Could not concentrate	21.74	10.67	1.94	(1.48–2.54)	9.01	2.14	(1.56–2.92)	10.57	1.53	(1.07–2.20)
Not feeling happy, all things considered	21.15	11.11	2.15	(1.64–2.81)	9.43	2.41	(1.77–3.29)	11.45	1.49	(1.05–2.10)
Felt worthless	16.17	5.30	3.40	(2.29–5.07)	4.30	4.11	(2.57–6.59)	4.22	3.16	(1.82–5.48)
Could not make decisions	14.95	6.00	2.74	(1.87–4.02)	5.03	2.97	(1.91–4.62)	6.04	2.16	(1.35–3.48)
Could not face problems	13.36	4.27	3.69	(2.39–5.68)	3.81	3.82	(2.34–6.24)	4.24	2.42	(1.38–4.22)
GHQ2+	51.11	26.80	1.90	(1.62–2.22)	24.96	2.02	(1.69–2.41)	30.61	1.53	(1.27–1.84)
GHQ3+	39.53	18.40	2.26	(1.85–2.75)	16.12	2.56	(2.03–3.22)	22.21	1.63	(1.29–2.06)
GHQ4+	31.84	14.00	2.43	(1.92–3.08)	11.79	2.84	(2.15–3.74)	14.55	1.85	(1.38–2.49)

^a Including 14 PhDs.

^b Including 1 PhD student.

GHQ4+=common psychiatric disorder

GHQ2+= psychological distress

Some interesting findings

- Significant relationships between GHQ2+ and high job demands or low job control: OR (odds ratio) of 1.896 meaning that for one-unit increase in job demands we expect 90% increase in the odds of experiencing GHQ2+
- Problems less prevalent in the execution phase than in beginning phases of PhD (OR of 0.739 for GHQ2+, 0.674 for GHQ4+)
- Better mental health for respondents advised by a professor with “inspirational leadership style” vs “laissez-faire style”: for each unit increase odds of GHQ2+ increase by 8%
- Family-work and work-family conflict increase odds of GHQ2+ and GHQ4+ and is the most relevant predictor
- Odds of GHQ2+ 34% higher in female, and 27% for GHQ4+
- LIMITATIONS: which way do we interpret this? Is academic world bad for mental health or individuals who start a PhD are more vulnerable?

Work-life vs life-work conflict

**215 US STEM postdocs in first 3 years of first postdoc appointment
(65% women 77% white)**

- 2 independent variables: work-to-life conflict and viceversa. 4 points scale disagree or not with statements (“Things I want to do at home do not get done because of job demands” , “My home life interferes with my responsibilities at work like arriving on time, working overtime”)
- GAD-7 scale: 7 point scale from 0 to 7 days indicated number of days they felt a number of feelings
- Some control variables like student debt, optimism, sense of control over one’s life, household income, relationship status, unfair treatment, success in publishing

Some results

- Nearly 62% “agree” or “strongly agree” to experience work-life conflict, 25% report life-work conflict
- No significant differences between single and couples, 50% of parents high life-work conflict
- Variables of general health, optimism, mastery of life negatively correlated with anxiety
- Science community appraisal associated with lower reports of mental health disorders
- Unfair treatment is positively associated with both life-work and work-life conflict
- Usual demographic covariates (gender, age, income) does not seem to be predictive, which is not the case for high educational debt
- When work-life conflict is added to life-work conflict model the latter is no longer predictive on anxiety
- LIMITATIONS: non random sample, no claims of causality, no foreigners

And some recommendations

“The uncertainty students feel about their performance, often caused by delayed positive evaluations of that performance, causes them to think of **effort – measured time spent engaged in something – as the best evidence of commitment and competence.**”

“ Often academic workers, postdocs and faculty mentors alike, create dedicated office spaces in their homes. We believe this is a mistake. Just as most employers are still resistant to create spaces for “life” (e.g., daycares, tv lounges, and exercise rooms) in work contexts, postdocs must endeavor to resist creating room (and, literally, rooms) for work in their living spaces.”

“ the culture of academic science seems to expect and privilege over-work. These cultural norms – this is not necessarily a function of the “nature” of science – can be managed and, if we all consider the health consequences of them, undone.”

On functional representations of the conformal algebra

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Acknowledgements This paper is dedicated to the memory of my friend, Francis Dolan, who died, tragically, in 2011. It is gratifying that I have been able to honour him with work which substantially overlaps with his research interests and also that some of the inspiration came from a long dialogue with his mentor and collaborator, Hugh Osborn. In addition, I am indebted to Hugh for numerous perceptive comments on various drafts of the manuscript and for bringing to my attention gaps in my knowledge and holes in my logic. I would like to thank Yu Nakayama and Hidenori Sonoda for insightful correspondence following the appearance of the first and third versions on the arXiv, respectively. I am firmly of the conviction that the psychological brutality of the post-doctoral system played a strong underlying role in Francis' death. I would like to take this opportunity, should anyone be listening, to urge those within academia in roles of leadership to do far more to protect members of the community suffering from mental health problems, particularly during the most vulnerable stages of their careers.

SIMPPS Service Prevention Santé on campus for students <https://www.univ-tlse3.fr/sante-social>: nurses, psychologists, psychiatrist, gynecologists etc..

- Nature PhD students survey 2019 <https://doi.org/10.1038/d41586-019-03459-7> [Dataset](#)
- Nature Grad students survey 2022 <https://doi.org/10.1038/d41586-022-03394-0> [Dataset](#)
- Nature 2020 postdoc survey <https://doi.org/10.1038/d41586-020-03235-y>
<https://doi.org/10.1038/d41586-020-03191-7> [Dataset](#)
- Levecque, K., Anseel F., De Beuckelaer A., Van der Heyden J., Gisle L. Work organization and mental health problems in PhD students, Research Policy, Vol 46, Issue 4, (2017) 868-879, <https://doi.org/10.1016/j.respol.2017.02.008>.
- The Mental Health Consequences of Work-Life and Life-Work Conflicts for STEM Postdoctoral Trainees, Pitt, R.N., Taskin Alp, Y., Shell I. A. Front. Psychol., 16 November 2021 Sec. Personality and Social Psychology <https://doi.org/10.3389/fpsyg.2021.750490>
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- [Cactus Foundation mental health survey among researchers 2020](#)
- [Understanding mental health in the research environment](#)