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Under pressure? Doctorate holders' satisfaction with their workload in academia and beyond.

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WORKLOAD

Workload is defined as the amount of work someone performs and the quality of the work performed (Jex, 1998). A balanced workload, that is the individual has an optimal task load, allows for innovation, original and unique research and leads to less burnout (Griffith & Altinay, 2020); also in an academic context (Khan, Rasil, Yasir, & Khan, 2019). Too much workload is related to decreased well-being and motivation (Vardi, 2009). Too little workload is related to boredom at work and causes suboptimal performance (Bakker & Demerouti, 2007). Thus, to obtain optimal performance, workload must be balanced to an optimal level. That optimal level may depend on employee and context characteristics (Bakker & Demerouti, 2007).

If we look at the academic context, workload is determined by roughly three components: education, service/administration and research. The education component includes, for example, teaching obligations and the supervision of master's theses. The service and administration component relates to involvement within and outside someone's own organization such as tasks within a research group, department, faculty, university and the wider (academic) society. Finally, research includes scientific publications and the raising of research funds.

The performance of academics is assessed mainly based on teaching and research performance, such as teaching evaluations and the number of publications. Notwithstanding that the importance of societal impact is gaining ground, the assessment of performance depends to a lesser extent on performance within the administration/service component (Flemish Department of Economics, Science and Innovation, z.d), possibly because it is more difficult to measure (Griffith & Altinay, 2020).

How does workload in the academic sector compare to workload in the non-academic sector? To date, no studies have made this comparison. Scientific research in Australia, however, does indicate that the increasing stress in the working population, which is partly due to an increasing workload, would be greater in the academic sector than in other sectors (Langford, 2010). In Flanders, we cannot distinguish between academic and non-academic contexts so far. However, the SERV's Employability Monitor did recently report an increase in reported workload in the Flemish labor market. In 2019, nearly 19% of the highly skilled workers in Flanders saw their workload as acutely problematic (Bourdeaud'hui, Janssens, & Vanderhaeghe, 2019).

But how satisfied are academics with their workload and how does this compare to doctorate holders working in the non-academic labor market? As indicated, the optimal level of workload can vary: an employee with a high workload may still be satisfied with it. Another worker may have a much lower satisfaction with that same level of workload.

In the current ECOOM brief we look at how satisfied doctorate holders in Flanders are with their workload. We also look at factors that might be related to the level of satisfaction. More specifically, based on the PhD Career Survey, we examine whether satisfaction with workload depends on the chosen career path. As in previous briefs on satisfaction aspects (see brief 27, brief 28 and brief 29), the current letter also examines whether there are differences between men and women and whether there are differences between science clusters. Specifically, we answer the following questions:

1. *How satisfied are PhD holders with their workload?*
2. *Does this satisfaction differ according to gender?*
3. *Does this satisfaction differ according to science cluster?*
4. *Does this satisfaction differ according to career path?*

ANSWERS BASED ON THE PHD CAREER SURVEY

We answer the above questions based on the PhD Career Survey conducted by ECOOM-UGent in 2017. For a detailed discussion we refer to ECOOM-brief 25. For a visual overview we refer to the website https://www.phdcareersflanders.com/en/. In short: the PhD Career Survey maps the career paths of PhD holders who obtained their PhD at one of the Flemish universities. In what follows we analyze the answers of 2982 PhD holders. The question they answered on satisfaction with workload was: "Please indicate how you feel about your workload in

your current job position." The response options ranged from "very dissatisfied" (=1) to "very satisfied" (= 5).

Based on the PhD Career Survey, we distinguished four career paths, namely (1) "*early switcher*": PhD holders in a non-academic job who left academia immediately after their PhD (33%); (2) "*late switcher*": PhD holders in a non-academic job who did have an academic appointment after their PhD (29%); (3) "*postdoc*": postdoctoral researchers (16%); (4) "*principal investigator*" (Tenured Academic Personnel): PhD holders who currently hold a position as professor at a university (22%). For more details on these career paths we refer again to ECOOM brief 25.

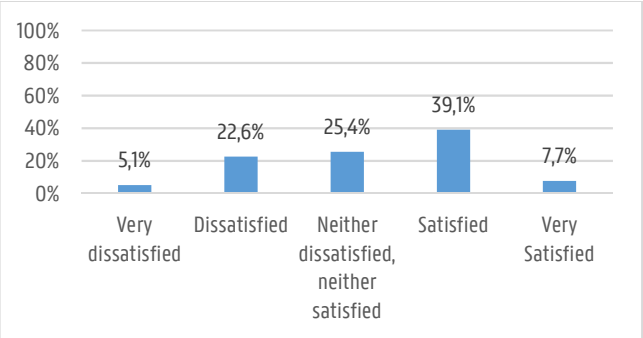
In the analyses, we differentiate according to gender, science cluster and career path. We use the Chi squared test and Cramer's *V*. Results are considered significant at $p<.05$. Both tests check whether the results differ significantly from each other. Cramer's *V* is less dependent on the sample size than Chi square. In science cluster and career path, posthoc comparisons were made using Chi square and Cramer's *V* where each category is compared to one other. Because of an increased chance of a Type 1 error, a stricter significance level was used for the post hoc comparisons (namely $p<.01$). These post-hoc comparisons provide insight into which categories differ significantly from each other.

HOW SATISFIED ARE DOCTORATE HOLDERS WITH THEIR WORKLOAD?

Figure 1 shows that almost half of the doctorate holders were (very) satisfied with their workload (46.8%), while 27.7% indicated they were (very) dissatisfied and 25.4% indicated they were "neither satisfied nor dissatisfied".

In what follows we disregard the group "neither satisfied nor dissatisfied" and look at who is most satisfied with their workload. We do this by grouping the doctorate holders who indicated to be "very dissatisfied" or "dissatisfied" in the category "(very) dissatisfied" (N=820). Those doctorate holders who indicated they were "satisfied" or "very satisfied" were grouped into the category of "(very) satisfied" (*N*=1386).

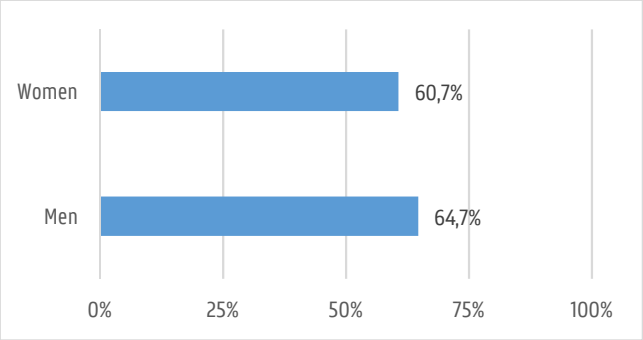
Figure 1: Distribution of satisfaction with workload among doctorate holders (*N*=2958).



DOES SATISFACTION DIFFER ACCORDING TO GENDER?

Looking only at gender (*N*=2206), we see no difference between the proportion of (very) satisfied female doctorate holders (60.7%) and the proportion of (very) satisfied male doctorate holders (64.7%) ($X^2(1) = 3.74$, $p>.05$; Cramer's $V = .04$, $p>.05$).

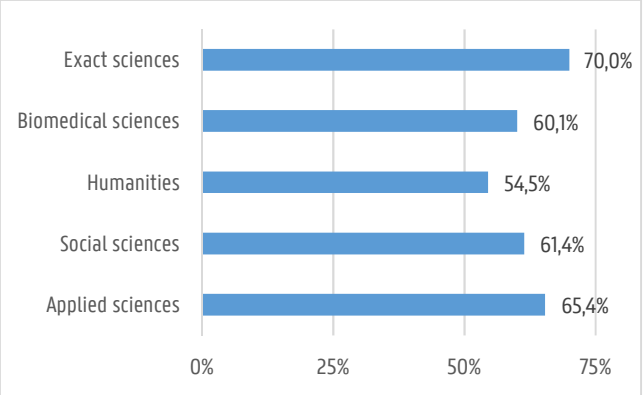
Figure 2: Share of male and female doctorate holders who are (very) satisfied with their workload (*N*=2206)



DOES SATISFACTION DIFFER ACCORDING TO SCIENCE CLUSTER?

Figure 3 shows that the share of doctorate holders who are (very) satisfied with their workload varies greatly depending on the science cluster in which the doctorate was obtained. We see the smallest share of (very) satisfied doctoral holders with a doctorate in the humanities, namely 54.5%. Subsequently, 60.1% indicate to be (very) satisfied with their workload when a doctorate was obtained in the biomedical sciences. In the social sciences 61.4% are (very) satisfied, in the applied sciences 65.4% are (very) satisfied and finally in the exact sciences 70.0% are (very) satisfied with their workload. Significance tests indicate a significant relationship between science cluster on the one hand and satisfaction with workload on the other ($X^2(4) = 23.61$, $p<.001$; Cramer's $V = .10$, $p<.001$). Additional post-hoc comparisons with a more strictly applied significance level ($p<.01$, see above) showed that the proportion of (very) satisfied doctorate holders with a doctorate in the exact sciences was significantly higher than that proportion in the biomedical sciences ($X^2(1)=9.81$, $p<.01$; Cramer's $V = .10$, $p<.01$), the human sciences ($X^2(1)=20.29$, $p<.001$; Cramer's $V = .16$, $p<.001$) and the social sciences ($X^2(1)=7.17$, $p<.01$; Cramer's $V = .09$, $p<.01$). The proportion of (very) satisfied doctorate holders from the humanities is also significantly smaller than the proportion of (very) satisfied doctorate holders from the applied sciences ($X^2(1)=10.53$, $p<.01$; Cramer's $V = .11$, $p<.01$).

Figure 3: Share of doctorate holders who are (very) satisfied with their workload broken down by science cluster in which the doctorate was obtained (*N*=2204).



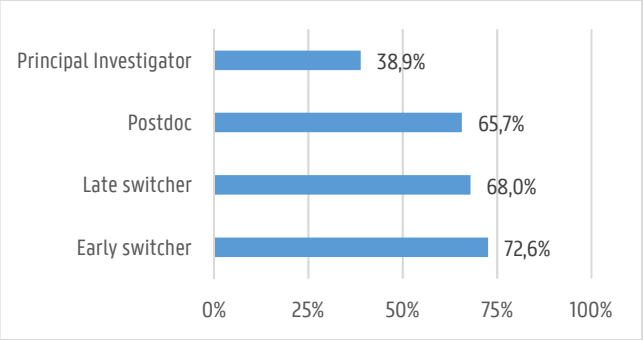
DOES SATISFACTION DIFFER ACCORDING TO CAREER PATH?

Does workload satisfaction among doctorate holders within the academic sector differ from that of doctorate holders in other sectors? And do we find differences within "those other sectors" between doctorate holders who first held a postdoctoral position and those who exchanged the academic world for a non-academic job immediately after their doctoral defense? In what follows, we distinguish four different career paths: (1) the "early switcher": doctorate holders in a non-academic job who left academia immediately after their doctorate (33%); (2) the "late switcher": doctorate holders in a non-academic job, who did hold an academic appointment after their doctorate (29%); (3) "postdoc": postdoctoral researchers (16%); (4) "*principal investigators*": Independent Academic Personnel or professors (ZAP) (22%). For more details on the different career paths we refer to ECOOM brief 25.

Figure 4 represents the proportion of doctorate holders who are (very) satisfied with their workload by career path. Significance tests indicate significant differences between the career paths ($X^2(3) = 149.09$, $p<.001$; Cramer's $V = .27$, $p<.001$).

Post-hoc comparisons with a more strictly applied significance level ($p<.01$, see above) show that the proportion of (very) satisfied professors is significantly smaller than the proportion of (very) satisfied early switchers ($X^2(1) = 127.28$, $p<.001$; Cramer's $V = .34$, $p<.001$), late switchers ($X^2(1) = 88.48$, $p<.001$; Cramer's $V = .29$, $p<.001$) and postdocs ($X^2(1) = 56.48$, $p<.001$; Cramer's $V = .27$, $p<.001$).

Figure 4: Share of doctorate holders who are (very) satisfied with their workload broken down by career path ($N=2059$).



DOES SATISFACTION DIFFER ACCORDING TO CAREER PATH AND GENDER?

Table 1 allows us to check differences in satisfaction **between career paths** for both male and female doctorate holders. We can also zoom **in on each career path** and investigate possible gender differences in satisfaction with workload among doctorate holders.

If we look at satisfaction with workload within each gender group according to career path, we find among male doctorate holders that the proportion who are satisfied to very satisfied with their workload depends on the career path ($X^2(3) = 94.36$, $p<.001$; Cramer's $V = .29$, $p<.001$). Post-hoc comparisons showed that the proportion of (very) satisfied male doctorate holders was significantly lower among the principal investigators compared to the early switchers ($X^2(1)=78.35$, $p<.001$; Cramer's $V = .35$, $p<.001$), late switchers ($X^2(1)=49.28$, $p<.001$; Cramer's $V = .29$, $p<.001$) and postdocs ($X^2(1)=39.88$, $p<.001$; Cramer's $V = .30$, $p<.001$)

For female PhD holders, we also found that the proportion of satisfied to very satisfied doctorate holders depended on the career path ($X^2(3) = 59.43$, $p<.001$; Cramer's $V = .25$, $p<.001$). The post-hoc comparisons showed that, like the male doctorate holders, the proportion of (very) satisfied doctorate holders in the Prinicipal Investigator career path is significantly lower than that of the early switchers ($X^2(1)=51.58$, $p<.001$; Cramer's $V = .32$, $p<.001$), late switchers ($X^2(1)=40.99$, $p<.001$; Cramer's $V = .30$, $p<.001$) and postdocs ($X^2(1)=20.86$, $p<.001$; Cramer's $V = .24$, $p<.001$).

Comparing men and women within each career path, we saw no significant differences at the $p<.01$ level. Remarkably, in the career path postdocs, there is a noticeable difference in the percentage of (very) satisfied doctorate holders with their workload. Indeed, we see that almost 72% of men are (very) satisfied compared to almost 60% of women who are satisfied. The difference in percentage is not significant at the more strictly used $p<.01$ level. If we were to use the $p<.05$ criterion here, the difference would have been significant. The less stringent significance level $p<.05$ does not change the findings in the career paths early switcher and late switcher.

Table 1. Share of satisfied doctorate holders with workload broken down by career path and gender ($N=2059$)

	Early switcher	Late switcher	Postdoc	Principal Investigator	Total
Gender					
Male	75.6%	70.0%	71.9%	40.9%	64.8%
Female	69.1%	66.0%	59.9%	35.9%	60.0%
Total	72.6%	68.0%	65.7%	38.9%	62.6%

DISCUSSION

How satisfied are PhD holders with their workload? In this ECOOM brief we see that almost half of the doctorate holders is (very) satisfied with this. We also see differences between groups. The share of (very) satisfied professors is the smallest: only 2 out of 5 are (very) satisfied. The largest share of (very) satisfied doctorate holders obtained a doctorate in exact sciences. Possibly there is an interrelation between the science cluster and the chosen career path. The share of doctorate holders with a doctorate in humanities in the career path "early switchers" is namely substantially smaller than doctorate holders in the applied and exact sciences. The reverse is true for the career path "Principal Investigators": the share of doctorate holders with a doctorate in humanities is substantially larger than the share of doctorate holders in applied and exact sciences (see ECOOM brief 25). There are no significant differences between men and women. These patterns are largely similar to those regarding satisfaction with work-life balance (ECOOM brief 29).

A noteworthy finding is that the proportion of satisfied doctorate holders is smaller when one is employed as a professor. Why would fewer doctorate holders be satisfied with their workload in this career path? In previous research within the academic population in Flanders anno 2010 shows that academics worked an average of 50 hours a week (Van Rossem, 2019). That average was well above the standard of 38

hours per week. The average number of working hours was higher for professors than for postdoctoral researchers (Van Rossem, 2019) and became higher according to the university rank (lecturer, senior lecturer, full professor, and full professor).

We try to contextualize our findings in light of the range of tasks that a university context entails. As indicated above, the workload of most academics is determined by performance on roughly three components, namely teaching, service/administration and research. In a traditional evaluation system, each of these components is associated with specific (primarily outcome-based) "hard" indicators on which one is evaluated. Some examples are teaching evaluations, number of publications and obtaining funding. Measuring performance purely based on these outcome-based "hard" indicators can result in various biases, for instance, because students do not judge the instructor based on his/her teaching but on their own points for that course (Crumbley, Flinn, & Reichelt., 2010). Another bias of such an evaluation is that it is difficult to consider the many hidden tasks that exist. For example, for administration and service delivery, it is difficult to estimate the time spent and assess performance. However, administration/service may be more time consuming than research (Snyder, De Brey, & Dillow, 2016).

The number of work hours invested in each component can vary depending on the researcher. For example, women tend to be more involved in teaching and service (O'Meara, Kuvaeva, Nyunt, Waugaman, & Jackson, 2017), while men tend to be more involved in research.

There are also certain accomplishments that barely affect the likelihood of obtaining a tenure position or promotion, primarily in the service component. Incorporating more service does not usually increase promotion chances. However, when those tasks are not performed or performed to a lesser extent, it can decrease the chances of tenure and promotion (Griffith & Altinay, 2020). On top of that the workload for example for services, is not the same for everyone. For example, various compositions of committees are required that are especially demanding of minority groups (such as women, international scholars, and people with disabilities) (Allen, Huggins-Hoyt, Holosko, & Briggs, 2018, Hanasono et al., 2019). Also, service often involves more time than originally calculated and often has strict deadlines (Currie & Eveline, 2011; Misra & Lundquist, 2016). In other words, certain academics are more involved in service, and this performance affects their evaluation less than their performance on the other two components. Because of this greater time investment, they have less time available to perform optimally on the other two components, which play a greater role in assessing their overall performance.

In recent years, we also noted various challenges associated with teaching and research, which can lead to a sensitive increase in workload. For education, we see several shifts in recent years. There is an increasingly diverse population of students (e.g., international students, working students, students with disabilities), each requiring different facilities (Griffith & Altinay, 2020). A student-centered system is increasingly used, which treats students as customers. This puts more pressure on teachers and professors. For example, students expect lecturers and professors to be available after normal business hours (Steenkamp & Robbers, 2020).

For research, we see that the publication pressure is increasing. On top of that, researchers are being asked to do more and more: the increasing regulations of the GDPR, open access, open data and valorizing research are just a few examples. All these additional expectations can result in, for example, greater social impact and integer research, but also increase workload.

It is possible that as workload increases for one or two components, the performance in the third component is reduced. For example, a large teaching load may result in reduced applications for research grants (Porter & Umbach, 2001). Similarly, a greater workload in service or administration finds an impact on research, as deadlines are less strict in research, making them more easily pushed forward (Currie & Eveline, 2011; Misra & Lundquist, 2016). A possible consequence of this is that people start performing more hours than officially necessary to be able to continue their research. We also see this trade-off in the previous Flemish study conducted in 2010: academics who invested less time in teaching, administration and service spent more time on research (Van Rossem, 2019). There was no trade-off between teaching, administration, and service: in other words, when academics invested more time in, for example, teaching, this also resulted in more time in administration and service (Van Rossem, 2019). The difference in trade-off between research and the other components can perhaps be partly explained by those strict deadlines that teaching, service, and administration entail. Another explanation is that time on one component automatically results in more time on another component. For example, the organization of education also entails more administration.

Finally, the current situation with COVID-19 necessitates a reflection on performance and workload. COVID-19 has made changes in education, such as digitalization. It has also mostly negatively impacted research, bringing more stress and workload (Byrom, 2020). The impact of COVID-19 on research could potentially be greater for female researchers (Bebiroglu, Golden, & Pinderhughes, 2021).

To optimize the workload of academics, a transparent appraisal system can be developed in consultation with each researcher that sets expectations and establishes agreements for each component (research, teaching, and service) and considers the team and organization in which the individual is employed. This personal assessment system also allows everyone to express his/her work hours. For example, several professors are willing to work more than 40 hours per week (Parks, Gabert, Affleck, & Kuhr., 1998), but this amount of work hours and workload is not an ideal situation for everyone to perform well and have a good work-life balance. Attention to the work-life balance is also crucial in this regard, as the proportion of satisfied professors with their work-life balance is lower than compared to the other career paths (ECOOM letter 29).

A turnaround from a classical appraisal system to an alternative appraisal system is not self-evident, requires support from all actors (professors, universities, policy and funding channels) and thus needs time. The results in this ECOOM brief are based on date from 2017. In the meantime, a lot has been set in motion in the academic landscape to alleviate the workload among academics.

Internationally, we are seeing a shift, with examples such as the Leiden Manifesto (Hicks, Wouters, Waltman, de Rijcke, & Rafols, 2015) and the San Francisco Declaration on Research Assessment (DORA, g.d.). The Leiden Manifesto advocates moving away from bibliometric indicators to estimating the quality of a publication (examples include the h-index and the impact factor). They provide 10 guidelines for assessing research in an appropriate and qualitative manner. The central idea of

DORA is to move away from the impact factor of journals to estimate the quality of a publication.

Within Flanders, we see that, for example, the Research Foundation – Flanders (FWO) is changing the focus of the evaluation of researchers and their research projects: they also take into account the quality and impact of the research, making the assessment go beyond the classic bibliometric indicators (FWO, g.d.; FWO, 2019)

A concrete example of evaluation of professors in Flanders is the reformation of the career model of Professors at Ghent University (UGent, 2018). The central idea of this model is ambition, career mentoring and talent. A vision is developed on how the professor will function, which considers the group level (e.g., research group, department and faculty). This allows diversity in core tasks and within domains: in addition to research and teaching, institutional and societal engagement is honored, and within those domains, it is possible to differentiate between activities and outcomes.

The recent shifts thus show efforts on different domains to reduce the workload in academia. However, it remains to be seen how and to what extent these shifts bring a change in the satisfaction with workload.

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