

PhD students and vigour: on bursting with energy, feeling fit and being enthusiastic about work

Authors: Katia Levecque¹, Fara Rigolle¹, Alain De Beuckelaer^{1,2}, Anneleen Mortier¹

¹ ECOOM Ghent University, Department of Personnel Management, Work and Organizational Psychology

² Radboud University, Nijmegen, Institute for Management Research

VIGOUR

What makes an employee feel full of energy, fit and strong and eager to go to work in the morning? Increasingly, organizations are addressing these questions. Research on vigour in the workplace reveals that healthy, fit and committed employees not only take fewer sick days. They also perform better: they are more productive, more flexible and more proactive in their professional development. Above all, they have more energy and take more pleasure in their work, which has positive spillover effects on colleagues, patients and/or clients. Vigour is closely related to health and contains both a mental and a physical component (Strijk et al, 2013). The mental component refers to resilience, the physical component to strength and fitness. Vigour is about (mental) resilience, about feeling fit, strong and energetic (Schaufeli & Bakker, 2004).

In this study, we focus on the vigour of PhD students in Flanders and ask ourselves four questions:

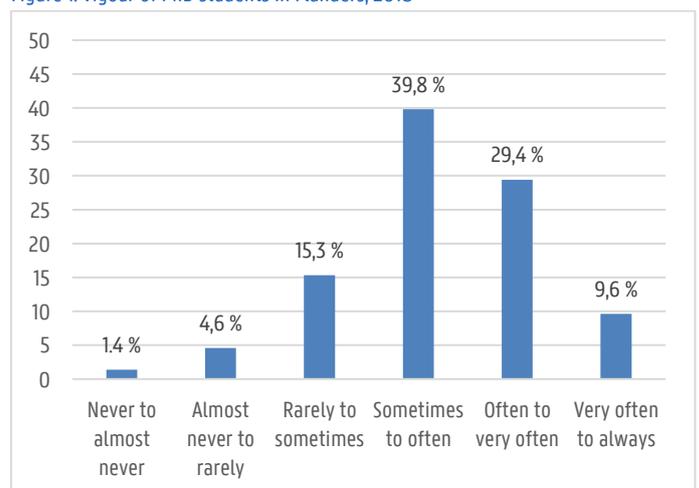
1. *How vigorous are PhD students in Flanders in 2018?*
2. *Does the level of vigour differ according to gender, nationality, science cluster and PhD phase?*
3. *Does the level of vigour differ according to the work and organizational context?*
4. *Is the level of vigour in PhD students in Flanders comparable to that of PhD students in other regions or to other groups on the Flemish labour market?*

We answer these research questions using data from the *Survey of Junior Researchers 2018*. This survey was organized by ECOOM Ghent University and sent to all junior researchers at the five Flemish universities. For the current analyses, we limit ourselves to those junior researchers in a PhD trajectory (N₂₀₁₈=3359). For more information on the survey, we refer to ECOOM-brief 17.

HOW VIGOROUS ARE PHD STUDENTS IN FLANDERS IN 2018?

Vigour is measured using three specific questions that are part of the shortened *Utrecht Work Engagement Scale (UWES)* (Schaufeli & Bakker, 2003). More specifically, survey respondents are presented with three propositions, namely: "At work, I feel bursting with energy" (item 1), "At my job, I feel strong and vigorous" (item 2) and "When I get up in the morning, I feel like going to work" (item 3). The response categories offered are 1= "never", 2= "almost never", 3= "rarely", 4= "sometimes", 5= "often", 6= "very often" and 7= "always". The vigour score of a PhD student is calculated by averaging the three item scores. Internal consistency of the scale is $\alpha=0.85$.

Figure 1. Vigour of PhD students in Flanders, 2018



We note that PhD students in Flanders report an average score of 4.51 (SD=1.03) on the vigour scale. This score is situated between the answer categories 4="sometimes" and "5=often". Figure 1 shows that less than 2% of PhD students in Flanders indicate that they never or almost never feel vigorous, 4.6% indicate almost never to rarely, 15.3% rarely to sometimes, 39.8% sometimes to often, 29.4% often to very often and 9.6% very often to always.

DOES THE LEVEL OF VIGOUR DIFFER ACCORDING TO GENDER, NATIONALITY, SCIENCE CLUSTER AND PHD PHASE?

In Table 1 we look at the average rating on each item of the vigour scale, as well as the average scale score. In order to determine whether there are any significant differences in reported vigour between different genders, nationalities, science clusters and PhD phases, we use both the one-way ANOVA F-test, or F-test for short, and the Welch-test. Both tests examine whether group averages differ significantly, but they are based on different (model-based) assumptions. As analyses based on both tests pointed to the same conclusions, we only report on the F-test in Table 1. With regard to nationality, science cluster and PhD phase, the difference analyses (between categories) were extended to include post-hoc comparisons (in particular Games-Howell) that compare each category with any other category.

Do male and female PhD students differ in terms of being energetic and feeling strong, vigorous and enthusiastic about going to work in the morning? Table 1 shows that female PhD students score significantly higher on the item "bursting with energy", while no significant differences are noted for the two other scale items or for the total scale score. As concerns nationality, Table 1 points to significant differences. Post-hoc comparisons for the vigour scale show that the significance is due to a higher degree of vigour reported by non-EU28 PhD students compared to Belgian and EU28 PhD students. There are also significant differences between PhD students from different science clusters. Post-hoc comparisons show that PhDs students in a PhD trajectory in the humanities report significantly higher vigour scores compared to their colleagues in other science clusters. Finally, Table 1 also points to differences in levels of vigour according to PhD phase. We notice that levels of vigour are lower in the later phases of the PhD track.

When interpreting associations based on simple cross-tabulations such as in Table 1, some caution is advised. As shown in Table 2 (see infra), the significance recorded for science cluster in Table 1 disappears when we simultaneously take into account the socio-demographic characteristics of PhD students, the characteristics of their work and their organizational context.

Table 1. Vigour by gender, nationality, science cluster and PhD phase of PhD students in Flanders, 2018: average (N=3359)

	Item 1: Bursting with energy	Item 2: Feeling fit and strong	Item 3: Feeling like going to work	Scale: Vigour
Gender				
Male	4.35	4.44	4.76	4.52
Female	4.43	4.41	4.68	4.51
(§)	*	n.s.	n.s.	n.s.
Nationality				
Belgian	4.44	4.36	4.70	4.50
EU28	4.28	4.31	4.68	4.42
Non-EU28	4.34	4.72	4.81	4.63
(§)	**	***	n.s.	**
Science cluster				
Exact sciences	4.38	4.32	4.64	4.45
Biomedical sciences	4.49	4.50	4.65	4.54
Applied sciences	4.26	4.37	4.65	4.43
Humanities	4.59	4.57	5.04	4.73
Social sciences	4.34	4.41	4.78	4.51
(§)	***	*	***	***
PhD phase				
Initiating	4.49	4.61	4.94	4.68
Executing	4.43	4.44	4.74	4.53
Finishing	4.23	4.25	4.48	4.32
(§)	***	***	***	***

(§) Significance based on the one-way ANOVA F test
n.s.=not significant * = p<0.05 ** = p<0.01 *** =p<0.001

DOES THE LEVEL OF VIGOUR DIFFER ACCORDING TO THE WORK AND ORGANIZATIONAL CONTEXT?

Table 2, generated from linear regression (OLS), provides us with the answer to the above questions. It shows that PhD students are significantly more vigorous (1) when they feel in control of their jobs (i.e. a high degree of job variation and job autonomy), (2) when their supervisor has an inspirational leadership style, (3) when they have a strong interest in an academic career, (4) when they perceive their odds of remaining in an academic career as good, and (5) when they have a positive perception of the value of their PhD in the non-academic labour market. In addition, (6) age also plays a role: the older the PhD student, the higher their reported level of vigour. Finally, (7) we also notice that PhD students with children report more vigour.

We see that PhD students report significantly lower levels of vigour (1) during the final phase of the PhD compared to the initial phase. Vigour is also lower (2) in PhD students employed on a research grant compared to PhD students with a mandate as an assistant, (3) when the team decision-making process is more closed (and thus less democratic) and (4) when there is a work-family conflict. Put simply, work-family conflict occurs when an unhealthy balance exists which forces a person to place work demands above the demands and needs of family, or when situations at work are brought into family life.

Table 2. Predictors of vigour in PhD students, SJR3 Flanders 2018 (N=3359): B, Standard error, β and significance

	B	Standard error	β	Significance
Constant	.623	.224	-	**
Work context				
Job demands	.012	.035	.007	n.s.
Job control	.690	.036	.316	***
Science cluster				
Exact sciences (ref.)	-	-	-	-
Biomedical sciences	.084	.053	.037	n.s.
Applied sciences	-.056	.055	-.023	n.s.
Humanities	.109	.072	.030	n.s.
Social sciences	.008	.056	.003	n.s.
Type of appointment				
Assistantship (ref.)	-	-	-	-
Scholarship	-.078	.049	-.036	n.s.
Research project	-.115	.049	-.053	*
No university funding	.005	.080	.001	n.s.
Other funding	-.008	.087	-.002	n.s.
Unknown funding	-.346	.108	-.054	**
PhD phase				
Initiating (ref.)	-	-	-	-
Executing	-.082	.045	-.039	n.s.
Finishing	-.197	.054	-.081	***
Inspirational leadership style	.220	.014	.277	***
Much interest in an academic career	.261	.037	.127	***
Perception of high chance of an academic career	.104	.038	.049	**
Positive perception of career outside academia	.144	.022	.114	***
Organizational context				
University				
KU Leuven (ref.)	-	-	-	-
Ghent university	-.001	.040	-.023	n.s.
Antwerp University	-.126	.055	-.040	*
VUB	-.051	.049	-.018	n.s.
Hasselt University	.027	.080	.006	n.s.
Closed decision-making in the team	-.073	.019	-.067	***
Family-work conflict	-.029	.021	-.024	n.s.
Work-family conflict	-.048	.021	-.048	*
Sociodemographic characteristics				
Female	.014	.035	.007	n.s.
Age	.017	.004	.082	***
Partner	-.020	.037	-.009	n.s.
Children	.222	.055	.076	***
Model fit :				
R ² = 0.384				

Note: B=unstandardized regression coefficient, β =standardized regression coefficient, Ref.=reference category. Significances: n.s.=not significant, *=p<.05, **=p<.01, ***=p<.001

Finally, Table 2 shows no significant difference in levels of vigour experienced by PhD students from the humanities, biomedical, applied and social sciences compared to PhD students in a PhD trajectory in the exact sciences. In addition, we observe no significant difference in vigour according to levels of job demands (such as workload and publication pressure), gender, a partner, or experiences of family-work conflict.

IS THE LEVEL OF VIGOUR IN PHD STUDENTS IN FLANDERS COMPARABLE TO...?

Although positive psychology is the fastest growing domain in psychology, there appears to be little empirical research with which we can benchmark our findings on vigour among PhD students in Flanders. Are PhD students in Flanders more vigorous than PhD students at universities abroad? Are PhD students more vigorous than other groups on the Flemish labour market? We found only one study that sheds some limited light on the first question. More specifically, a recent study on PhD students at Groningen University shows that the average score for vigour measured with the same scale as in the present study is 4.16 (SD=0.98) (Van Rooij et al. 2019). This is lower than the average vigour score of 4.51 (SD=1.03) reported for PhD students in Flanders. A similar finding in both studies is that PhD students feel less vigorous in the later phases of their PhD track and PhD students from outside the EU28 show significantly higher levels of vigour compared to their colleagues from within the EU28.

One of the main reasons for the limited benchmarking opportunities of vigour scores is that vigour is usually only studied as a dimension of work engagement. Vigour is one dimension, dedication and absorption two others. Dedication refers to one's commitment and ambition, while absorption refers to being so engrossed in work and concentrating so fully that time seems to fly by.

DISCUSSION

Scientific research on vigour among academics is still limited. Our research shows that about 39% of PhD students at the five Flemish universities indicate that they often or always feel vigorous, while 6% report that they never or rarely feel vigorous. From the perspective of diversity, we do not note significant differences in vigour according to gender, but we do observe higher vigour scores among international PhD students originating from outside the EU28. It is unclear whether these vigour scores are comparable to PhD students from universities outside of Flanders or with other groups on the Flemish labour market. Research focusing on PhD students and looking at their work engagement, of which vigour is a subdimension, shows that a high level of engagement is accompanied by less emotional exhaustion (Rigg, Day & Adler, 2013), less stress, more job satisfaction (Caesens, Stinglhamber & Luybaert, 2014), more creativity and more productivity (Bakker & Demerouti, 2008). Sometimes engagement is presented as the "positive counterpart of burnout", but such statement needs to be approached with some reservations: the absence of burnout does not simply imply the presence of engagement. However, the research by Van den Broeck,

De Cuyper, De Witte and Vansteenkiste (2010) shows that vigour correlates negatively with emotional exhaustion. For PhD students in Flanders in 2018, vigour shows a negative Pearson correlation of $r=-0.384$ ($p<0.01$) with the number of mental health problems, as measured by the *General Health Questionnaire* (GHQ)-12. The Pearson correlation between vigour and overall job satisfaction is $r=0.623$ ($p<0.01$). We refer to ECOOM-briefs 22 and 18 respectively for more information on the measurement instruments used for mental health and general job satisfaction.

What makes a PhD student burst with energy throughout their PhD track, keeps them feeling fit and strong and enthusiastic about going to work? Different aspects play a role, including a person's physical health and their personality. The literature on engagement also refers to factors such as emotional intelligence and personality. Research shows, for example, that engagement can be partly explained by personality characteristics such as openness to new experiences, extraversion and being conscientious (Akhtar, Boustani, Tsivrikos, & Chamorro-Premuzic, 2015), as well as positive affectivity (Young, Glerum, Wang, & Joseph, 2018). In the current study, we focused on the work and organizational context in which the PhD is being pursued and we identified two risk factors. Levels of vigour turned out to be significantly lower when people were part of teams with closed decision-making processes and when people experienced a work-life imbalance. Higher levels of vigour are reported by PhD students who indicate that they have an inspirational supervisor and high job control, an interest in an academic career, expectations that an academic career is feasible for them, but also when they have a clear sense of the added value of a PhD on the non-academic labour market. We invite the reader to examine whether, how and to what extent the same work and organizational risk factors and leverages mentioned in the current study on vigour also influence other aspects of the wellbeing of PhD students in Flanders. More specifically, we refer to research findings on mental health (ECOOM-briefs 12 and 22), general job satisfaction (ECOOM-briefs 13 and 18) and turnover intentions (ECOOM-briefs 14 and 19).

Interventions to promote or optimise vigour in employees have been set up in many different organizations. Such interventions are of a very diverse nature. Knight, Patterson and Dawson's meta-analysis published in 2017 categorised engagement interventions into four types. The first type groups interventions promoting personal resources, such as increasing self-efficacy or self-activation. Interventions of the second type promote engagement by offering employees work-related tools, leading e.g. to increased employee's autonomy to fill in the content and process of their job. A third type of intervention offers leadership training, while the fourth type targets engagement through health promotion. Knight et al. (2017) found that there was no difference in the effectiveness of the four types of interventions. Overall, the four intervention types appeared to result in a small increase in work engagement, especially in vigour. The kind of intervention strategy an organization chooses should not only depend on the risk factors affecting the vigour of employees, but also on the tools that are present at the level of the individual, the job, the team and the wider organization.

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