

Employee Performance, Working Time and Tiredness in Creative R&D Jobs: Employee Survey from Estonia



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Abstract Optimal use of the intellectual resources of R&D employees is a significant success factor for achieving innovation and socio-economic development. Statutory and company level regulation of working time, including the durations and timing of a working day and a working week, remains a common feature in many countries, and these rules often apply, among others, to creative R&D employees. Our study seeks to investigate the relationships between the drivers and outcomes of creative R&D employees' work performance with particular focus on working time arrangement and the related tiredness, workability, work satisfaction and creativity issues. Our survey covers a sample of 160 creative R&D employees in Estonia. This conference proceedings paper gives an overview of some aspects of the first phase of our survey, while the more detailed results will be published in separate papers. Our findings include that 79% of the surveyed employees would prefer to work under a different working schedule compared to the standard 5-day working week, and 81% would prefer to have a daily schedule with an irregular start and/or end time of the working day. Emotional tiredness, sleepiness, low salary and inefficient time use are seen as major obstacles to achieving creative work results.

Keywords Working time • Tiredness • R&D jobs • Employee performance • Estonia

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1 Introduction

Creativity and efficient use of knowledge have become key success factors for innovation, economic development and broader socio-economic sustainability in the modern highly competitive world. Various programmes and regulations have been implemented to stimulate innovation in the battle for gaining or sustaining competitive advantages. The role of working time regulation in creative research and development (R&D) jobs has however been largely disregarded.

Setting the durations of a working day and a working week remains a common feature in many countries, and these rules often apply to creative work similarly to other jobs. Also, companies, including employers of R&D professionals, tend to set a standard start and/or end time to the working day. There is however very limited empirical evidence on the relationship between working time patterns, tiredness and creativity.

The design of our study stems from the understanding that the fit-for-all working time regulations ignore job- and profession-wise differences in terms of the creativity and time freedom required. Creative work might be more efficiently performed under a flexible arrangement where the working time can be primarily decided upon by the employee. Employer considerations, including, for example, teamwork requirements, access to physical resources and project management aspects, should be however addressed.

Our broader study comprises conceptual argumentation and empirical research on the impact that working time regulation has, through different channels and mechanisms, on individual creativity. Potential paradigm shift and revision of statutory and company level working time regulations may have a significant contribution to stimulating creative R&D employees' work performance. This conference proceedings paper gives a brief overview of some aspects of our survey, while the more detailed results will be published in separate papers (see, e.g. Hazak et al. 2016, 2017; Virkebau and Hazak 2017).

2 Literature

Previous research in the field has mainly looked into the direct and indirect factors that influence job performance, while working time arrangement has been one of those factors. The concept of flexible working time and the first empirical studies on that originate from the 1970s—for a survey on inaugural research on the effects of flexible working time arrangements, refer to Golembiewski and Proehl (1978). Research within the past 40 years has demonstrated that the design of working time has an impact on work motivation, workability and job satisfaction (see, e.g. Parker and Wall 1998; Grant and Parker 2009) as well as on employee performance (see, e.g. Fried and Ferris 1987). Also, the linkages between working time, employee health and broader well-being have been shown—refer to Grant and Parker (2009) for a detailed review of conceptual and empirical studies.

Kelliher (2008), for example, has found that job satisfaction, organisational commitment and perceived stress level are among the key impact factors of job performance. Additionally, she notes that the impact is stronger when individuals have more flexible work options available. Kelliher (2008) also claims that flexible working encourages positive attitudes towards work and organisations, which translates into harder work effort and improved performance.

Out of the previous research on the relationship between work time flexibility and stress and health symptoms, Moen et al. (2011) have found evidence that higher work schedule flexibility is associated with better sleep and health behaviour as well as improved well-being. Their study does not relate to creative jobs however (but white-collar employees in general) and the working time-health-creativity nexus remains a gap yet to be filled in literature.

Amabile et al. (2002), focusing on creative jobs, have found evidence that stress and constant time pressure are the main factors that are having a negative effect on creative work results. They also claim that a fixed working time arrangement amplifies the negative effect of the counter-creativity factors.

Overall, the research results on the interrelations between working time arrangement, work performance, job satisfaction and health issues have been however very controversial. In a recent comprehensive review, de Menezes and Kelliher (2011) highlight that 31% of the studies to date have found support that flexible working time encourages employee performance or productivity, whereas 69% of the studies did not identify such an effect. Moreover, 57% of the studies reviewed by de Menezes and Kelliher (2011) have found evidence that flexible work time supports job satisfaction, while 40% find no such effect, and 32% of the studies have demonstrated that flexible work time supports the health or well-being, while 69% find no such effect.

As an example of recent studies focusing on creative jobs, Seo et al. (2015) have investigated the impact of absorptive capacity, exploration and exploitation on individual creativity. Based on a survey analysis, they find evidence that creative self-efficacy, which is a subjective belief that an individual possesses a personal creative ability, is positively related to actual creative abilities. Additionally, they find that subjective well-being moderates the relationship between creative self-efficacy and creativity. Generalising their results, work motivation and subjective well-being have expectedly a significant impact on creativity and innovativeness.

3 Data and Methodology

We have performed a survey among creative R&D employees in Estonia. For our study, we have defined creative R&D employees as the “researchers” under the R&D employees’ category as per the following Statistics Estonia definition. An employee is considered to be engaged in R&D if at least 10% of his working time is spent on R&D tasks. A “researcher” means “a professional with an academic degree or higher education diploma, engaged in basic or applied research or

experimental development to create new knowledge, products, processes, methods and systems; all academic staff engaged in R&D activities, as well as managers and administrators engaged in planning and management of the scientific and technical aspects; postgraduate students and persons attending doctor's courses, who perform original research". We have excluded the "technicians" and "supporting staff" under the R&D employees' category as their working tasks are not necessarily creative. Based on the 2012 data by Statistics Estonia (which we have used as the basis for compiling our sample), there are a total of 4.6 thousand creative R&D employees in Estonia.

As a next step, we have excluded from the population of interest for our study the creative R&D employees working for higher education (2.5 thousand employees) as the working time arrangement at higher education institutions is strongly determined by teaching schedules which significantly interfere with the fixed versus flexible working time choices that our present study is focused on. We have also excluded microenterprises and research institutes with less than 15 creative R&D employees (total 1.0 thousand employees in full time equivalent) as we believe that the considerations for working time arrangements at microentities are significantly different from these at larger organisations. As a consequence, the population of Estonian creative R&D employees, excluding those of universities and microentities, totals approximately 1.0 thousand.

We have identified that the above population comprises the employees of a total of 23 employers, i.e. private companies and public research institutes. We have contacted all of those employers with a proposal to participate in our study. In the first phase of the study, which the present conference proceedings paper summarises, eight employers accepted our invitation. The participating entities represent different areas of activity, as outlined in Table 1. The table also shows the number of participants from each entity whose responses to the survey were taken into account. The latter eliminations of participants with completed survey responses from the sample relate to two reasons:

- Removal of observations where respondents had given the question "Do you consider your work a research and development activity, which requires creativity?" an answer "Rather not" and "Not at all" (13 such responses)
- To avoid distorted results, removal of observations where respondents had answered that they also work for another employer for more than 20 h a week, as such results may indicate that the creative R&D work might not be the main job of the respondent (two such responses)

Our sample of 160 employees thus represents 15% of the total population of 1.0 thousand. We note that the employees in the population were not approached randomly but on a company basis, and individual employees in the population therefore had a chance of being included in the sample only in case their employer agreed to participate in the study. We address the related selection bias for econometric modelling by weighting the results considering (1) the field of activity in each of the participating entities and (2) gender. We employ, additionally, clustering of standard errors by employers to address the selection bias. Results and further

Table 1 Entities and employees in the sample

Sector	Industry	Number of employees in the sample
Private	Technology	45
Private	Banking	30
Private	IT	27
Public	R&D	16
Public	R&D	12
Private	R&D	12
Private	Banking	9
Private	Banking	9
Total		160

methodological aspects of the econometric models will be available in separate papers, and due to copyright considerations, the current conference proceedings paper is limited to some descriptive statistics and general commentary on the study.

The electronic questionnaire-based survey was undertaken in spring-summer 2015. Participation by the employees whom we invited to complete the Internet-based survey was voluntary and confidential. The questionnaire comprised a total of 90 questions in the following areas:

- Organisation of work
- Work satisfaction
- Work results
- Sleepiness
- Sleep patterns
- Tiredness
- Health
- Additional information

The following section outlines some of the preliminary results from the questionnaire survey.

4 Preliminary Results

As a starting point, we seek to identify whether there is any gap between the actual and desired working time arrangement of the creative R&D employees in our sample.

It appears that a large majority (61%) of the creative researchers and developers would prefer their work to be concentrated to 3–4 days per week. Only 21% of the employees who participated in the survey would like to work for the standard 5 days per week, while some would prefer the working week to be distributed over 6–7 days, and some would wish to work in an extra concentrated way so that weekly work could be allocated to just 1–2 days (refer to Fig. 1). These preliminary findings

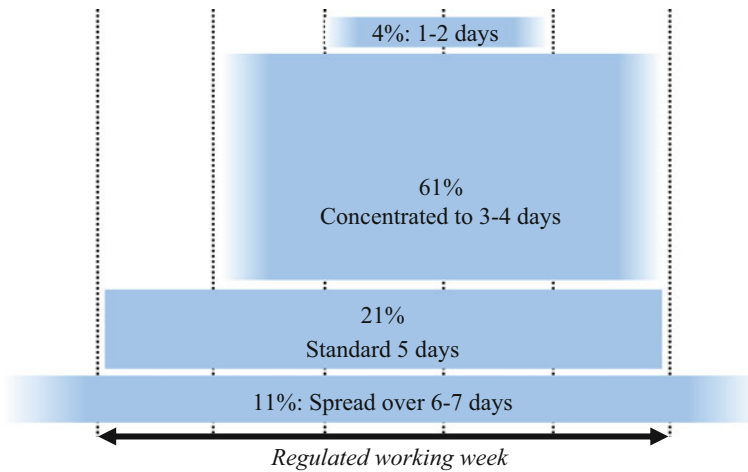


Fig. 1 Employees' preferences for a working week in R&D jobs (*our survey results*)

support setting the hypothesis for further analysis that forcing creative R&D employees to work at nonpreferential time may lead to inefficient use of their creative capacities as well as have an adverse impact on their work-life balance and work motivation.

Furthermore, we enquired the survey participants about their preferences regarding the distribution of working time over the working day, and the preliminary results signal a strong contrast between the standard working time regulation and desired working time arrangement. Only 19% of the survey participants would prefer a working day with a fixed start and end time (refer to Fig. 2). Thirty-five percent of the respondents would prefer total flexibility in daily working time as they would like to work for different hours at different days. Further 21% would prefer to have a regular part of the working day (for meetings, teamwork, etc.) with the rest of the working day being with flexible timing. Again, we find support to setting a hypothesis for the more detailed analysis that the gap between regulated working hours and desired daily working time allocation may lead to both company and employee level inefficiencies.

As a next step, we are interested in the perceived impact that switching from fixed to flexible working time, and vice versa, would have on the employees' work satisfaction, work results and quality of their work. 117 (73%) of the survey participants regarded their current working time arrangement as flexible and 43 employees (27%) as fixed.

As illustrated on Fig. 3, the survey participants with a fixed working time considered a potential change to flexible working time regime to have a major positive impact on their work satisfaction as well as both work results and the quality of work. Those working under a flexible working time regime considered a potential change to fixed working time to have a negative effect, but interestingly the perceived impact is not large. Overall, these survey responses advocate for

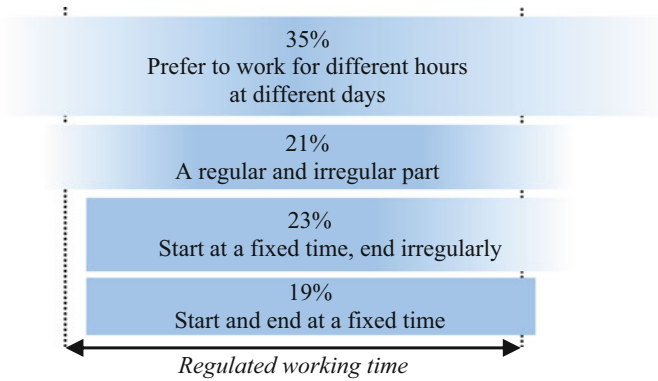


Fig. 2 Employees’ preferences for a working day in R&D jobs (*our survey results*)

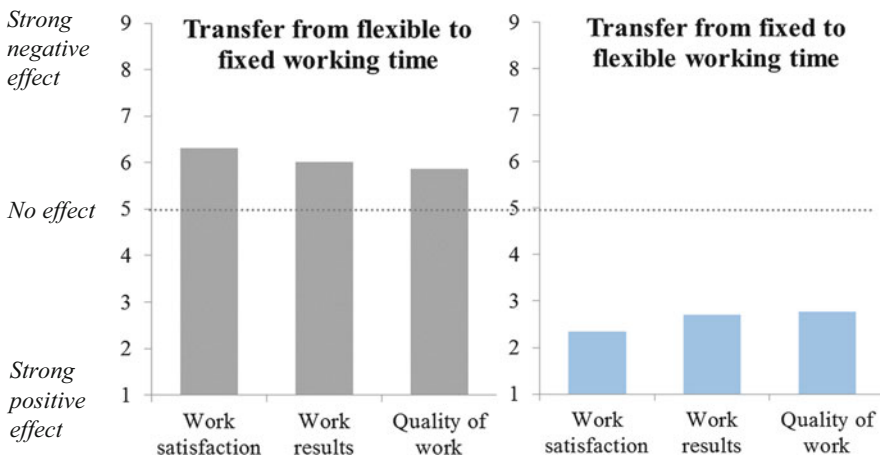


Fig. 3 Perceived effect of changing working time regime in R&D jobs (*our survey results*)

setting a hypothesis for further analysis that flexible working time would have a positive effect on work satisfaction of the creative R&D employees as well as on their work results and quality of work.

Next, we were interested in the drivers of the creative R&D employees’ work satisfaction, work results and quality of work. Among other questions, we asked the survey participants which factors have a negative impact on their work satisfaction. As illustrated on Fig. 4, the key perceived problem areas appear to be emotional tiredness, sleepiness, low salary, working environment, inefficient time use and unclear work tasks as well as physical tiredness and managerial problems. These are the areas that our further study is focused on in more detail.

The survey participants were asked a similar question on the obstacles to achieving work results, and their responses reveal that emotional tiredness, sleepiness, unclear work tasks, inefficient time use and working environment are

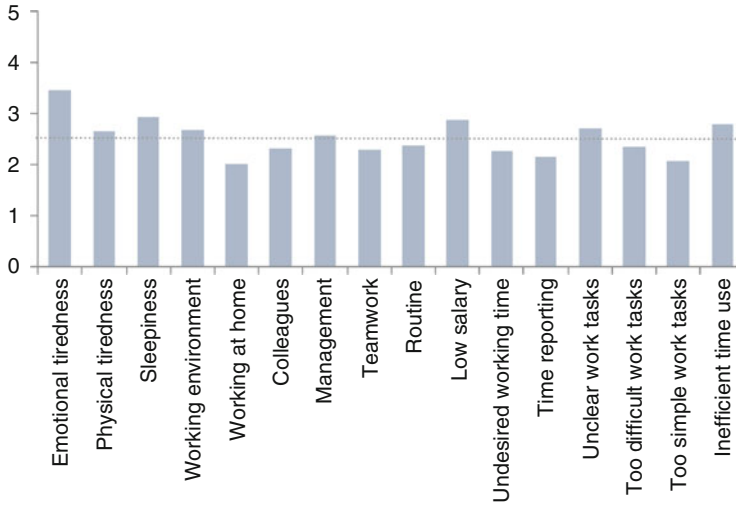


Fig. 4 Perceived factors decreasing work satisfaction (*our survey results*). Note: The figure shows the respondents' mean assessment of the impact of a particular factor on the following scale: 1 no impact, 2 little impact, 3 medium impact, 4 large impact, 5 full impact

perceived as factors which have the strongest negative impact on achieving desired work results.

Among other questions, we enquired the survey participants about the perceived causes of their emotional tiredness—the main distracting factor for both work results and work satisfaction. The results are outlined on Fig. 4, which shows the number of respondents who mentioned these particular factors among the main causes of tiredness.

It appears that high workload, sleepiness and anxiety are among the main perceived causes of emotional tiredness of the creative R&D employees who participated in our survey. We also note that out of the 43 employees in the sample who work under a fixed working time regime, 27 (63%) considered the fixed working time that does not suit their time preferences as a major cause of their emotional tiredness (Fig. 5).

Overall, the preliminary results of our study suggest that emotional tiredness and sleepiness are major problems in creative R&D jobs in the sample of Estonian companies and research institutes which participated in our survey. These issues along with inefficient time use which is perceived as another key problem in achieving better work results and work satisfaction could be at least partially addressed by introducing more flexible work options to creative employees. While the current conference proceedings paper provides a brief introduction, more detailed results of our study will be available in separate papers. We would like to note that this is part of a larger effort by the research group to investigate the company level (Hazak and Männasoo 2010; Maripuu and Männasoo 2014),

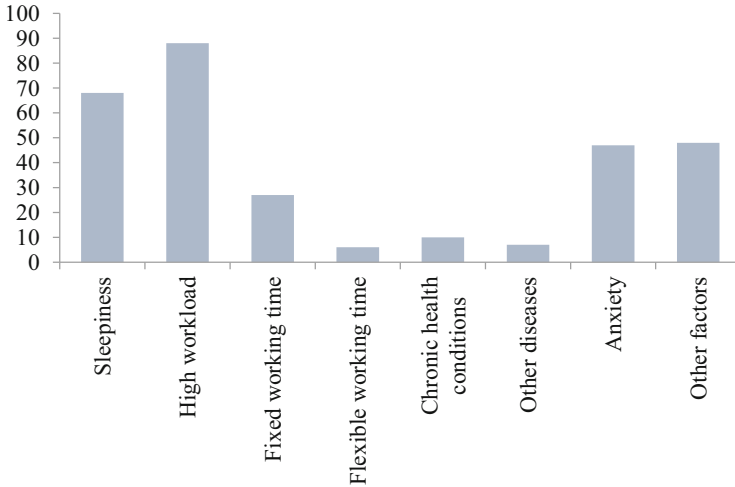


Fig. 5 Perceived causes of emotional tiredness (*our survey results*)

regulatory (Hazak 2008, 2009), financial and market driven (Avarmaa et al. 2011, 2013; Männasoo et al. 2017) aspects of development in emerging markets focussed on increasing R&D and knowledge intensity. We hope that these papers help to stimulate discussion on these important topics in society.

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