Does intense time pressure at work make older employees more vulnerable?
A statistical analysis based on a French survey “SVP50”

S. Volkoff a, C. Buisset b, C. Mardon a,*

a CREAPT (Centre de Recherches et d’Etudes sur l’Age et les Populations au Travail), Centre d’Etudes de l’Emploi, 29 promenade Michel Simon, 93160 Noisy-le-Grand, France
b AMEST (Association Medecine Et Santé au Travail), Lille, France

ARTICLE INFO

Article history:
Received 13 February 2007
Accepted 22 December 2009

Keywords:
Ageing
Intensification
Time pressure

ABSTRACT

Two general trends, the tightening of time constraints and the ageing of the working population, are likely to raise sensitive problems implying adjustment of both work and workers’ characteristics. The statistical studies presented in this paper, referring to a French inter-professional survey conducted on health and work after fifty (11,213 employees), aim at verifying this assumption. The analyses presented are divided in four sub-questions: have part of employees over fifty been removed from time pressure situations? Is time pressure difficult to deal with for older workers (from their point of view)? Does intense time pressure imply increased prevalence of certain health disorders among senior employees? Does pressure increase the desire to end one’s professional life early? The results show that intense time pressure raises serious problems for most of the employees in their fifties who are exposed to them. 80% consider this constraint to be “difficult”. They systematically show more frequent rates for most types of physical or psychological health disorders. “Sheltering from the job”, which implies being shifted from work “under pressure” to a job “without pressure”, is not uncommon but only solves a minority of situations. Lastly, the option of earlier retirement is not particularly developed in age group in its fifties working “under pressure”.

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1. Introduction: coinciding trends

Many international-scale analyses consider the intensification of work to be a major development in the industrialised countries’ production systems (Askenazy, 2001; Boisard et al., 2003; Burchell et al., 2002; Green and McIntosh, 2001; Valeyre, 2004). This development often counters the beneficial effects of the technical progress made on the quality of life at work (Brenner et al., 2004; Green, 2004). Its prominent feature is a simultaneous expansion of the main forms of time constraints in the accomplishment of work, whether of “industrial” nature (automatic paces, short time, strict production standards…) or “merchant” nature (pressure of clients or the public, waiting lines, just-in-time,…). This results in an accumulation of different forms of time constraints in a given work situation. Among French blue-collar workers, for instance, in the mid 80s the conjunction of automation constraints and pressure of demand was extremely rare; however, at the end of the century, the proportion of workers who were subjected to both constraints was nearly one out of five. Symmetrically, the percentage of white collar workers who were forced to work at a given pace due to the constant supervision of their superiors (a rather “industrial type” of constraint) rose from 13% to 38%.

During that same period a different type of change also occurred and is still developing: the ageing of the active population in these highly industrialised countries. This trend is general and ongoing even though its magnitude and timing may vary from one country to another (OECD, 1998). Its is mainly due to the evolution of birthrate in the second half of the twentieth century: the high birth-rates following the Second World war dropped after 60s. The forties and fifties age group are the largest in number, a factor accounting in itself for an ageing of labour. Furthermore, the oldest in these groups are reaching or are about to reach retirement age. Given their number and the increase in life expectancy this raises a pension funding problem; in many countries, due to this need for funding, the public policy aims at prolonging professional life and raising the employment rate of “seniors”.

Our general assumption is that both these trends – the tightening of time constraints and the ageing of the working population – will not be easy to reconcile and are likely to raise sensitive problems implying adjustment of both work and workers’ characteristics. The statistical studies presented in this paper aims at verifying this assumption.
After reviewing some scientific findings concerning the difficulties ageing workers face under the pressure of heavy time constraints, we will divide the issue in four “sub-questions”. We will examine each one successively, referring to the results of a relevant French inter-professional survey conducted on health and work after fifty (SVP50). For that purpose we will present the general methodology of the survey, and for each of the “sub-questions” we will indicate the particular analyses carried out, the results achieved and a number of comments we feel such results call for. A broader discussion on the four questions grouped together will be presented at the end of this paper.

2. Ageing and time pressure: a few basic facts

A valuable tool for demographers, industrial, psychologists or ergonomists to pinpoint the aspects of work that are likely to cause difficulties for ageing workers, is the analysis of age-based selection mechanisms (Volkoff and Molinie´, 1998). Some work situations determine “age limits” in practice at an earlier or later stage. In such situations the presence of employees beyond these age limits is relatively rare. This type of phenomenon was analysed with regard to different constraints: night shifts, strenuous postures, etc. Intense time pressure is one of these selective characteristics.

For example, in an aeronautics company posture constraints were assessed in parallel with time constraints on workstations covering 260 workers. Crossing over the data against age clearly shows that combined exposure to these two constraints is less frequent in older workers, and the decrease is even sharper for time pressure than for postures (Millanvoye and Colombel, 1996). The assignment of employees according to their age to the different tasks was distributed in teams in such a way that part of the “older” workers was “removed” from exposure to emergencies. Molinie´ (1999) reaches the same conclusion on the basis of an inter-professional survey on both past and present characteristics of life at work. According to the author, repetitive work under tight time constraints belongs to a category of constraints termed as “stationary and selective” which she characterises as follows: “no declining trend is observed in this type of constraint; the proportion of wage-earners that have never been exposed fluctuates very little according to age. And the number of workers having ‘past exposures’ is equal or superior to the number of those ‘presently exposed’, for each cohort (…) in significant numbers, workers concerned find a way, and/or are obliged, to free themselves from these constraints after several years of exposure”. More recently this author found similar results by analysing data from European surveys on working conditions: the odds-ratio per age, in terms of cumulated “industrial” and “merchant” constraints, decreases after 30 – providing, for the effects of gender, economic sectors, social categories and national specificities (Molinie´, 2003).

An explanation to these selection mechanisms can be found in the literature available in work psychology and physiology (Marquie´, 1998; Salthouse, 1985; Welford, 1985). According to these research studies, the changes occurring in the body over time, amongst other consequences, in a gradual slowing down of behaviour when fulfilling tasks requiring precise gestures particularly, but also in some decision processes under tight time constraints. This literature relates to progressive deficiencies in sensory captors, a slight deterioration in the detection of signals/noise, a reduction (equally slight) in nervous transmission speed, in addition to the cautious attitudes shown by older employees and their tendency to check even very short events, to verify the quality and the meaning of useful information, among others. This tendency is characterised by a strong inter-individual diversity that increases with age. The differences noted depend on the nature and difficulty of the task (Davies et al., 1992; Salthouse, 1990). In moderately difficult conditions the effects of age are mainly noticeable after 60 or 70, whereas severe constraints can lead to a decrease in performance at a much earlier age, at the very onset of adult life.

These experimental studies are based on “exercises” that greatly differ from those in a work context. The individuals tested are unfamiliar with the material given and the actions they must perform. Experience can therefore not be valued. The result they must achieve is not part of a personal or professional project. Being confronted with younger workers in a task that they do not control well can be a trying experience; the whole situation is unusual, unrelated to the past or the future. It is thus useful to closely observe how, in an actual work situation, men and women of different ages react to time constraints. The research carried out in this field by ergonomists leads to more complex and subtly nuanced judgements on the relations between age and the speed with which an activity is performed (Gaudart, 2000; Volkoff and Pueyo, 2005). The ergonomic analysis of an activity reveals the combined effects of age-related functional declines and the building of experience. Strategies to cope with time constraints, in particular, are elaborated and though such strategies are not “specific” to older workers they are more developed in the older age group. Volkoff and Pueyo (2005) note operating modes consisting in “wasting time to gain time”, “anticipating emergencies”, “building and making use of team work”, “taking over new situations” and even “re-elaborating the working rules”. Hence their more general conclusion: “the elderly have built up the experience necessary to conceive these strategies, and they need them more on account of their difficulties. Both reasons are linked: part of the experience develops because it is necessary”.

Are these strategies always feasible and effective? Are they sufficient for older workers to overcome the difficulties caused by intense time pressure, keep up with the pace required, cope with emergencies, while preserving their health? It is useful to have statistical evaluations on the relationship between age, time pressure, and health condition. To the best of our knowledge, though professional epidemiology yields important data on the relationship between pressure and health (pressure is a component of the “job demands” in Karasek’s and Theorell’s, 1999 questionnaire), or between age, work, and health (Brugere et al., 1997; Illmarinen, 1997; Koskela, 1997; Volkoff et al., 1998), there are fewer quantitative studies relating age, pressure, and health.

Many of these studies deal with musculoskeletal disorders and their variations with age. Such disorders are due to repetitive gestures and are generally aggravated by time pressure. In France, for instance, the Institut de Veille Sanitaire (Health Watch Institute) set up an experimental network for the epidemiological follow-up of these disorders (Roquelaure et al., 2005) in 2002 over a period of 3 years in the Pays de Loire region. The preliminary analyses show that the prevalence of symptoms increases significantly between age groups 30–39 and 50–59 regardless of gender. Another study conducted on female workers in the garment industry (Vinet et al., 1989) was designed to examine the potential effects of severe time constraints on workers’ health. The age range of the women selected for the study was 45–70. Among the women currently employed, the probability of taking medication for stomach disorders was greater for pieceworkers than among women who received an hourly wage. The probability was also higher for women who did repetitive work than for women who did non-repetitive work. Finally, as shown in one of our previous research studies (Buisset et al., 2001), some of the negative effects of time pressure become more evident from 45 or 50 onward: in a population of 2881 female white collars (included in the French “Estev” survey sample), we found out that the consumption of sleeping pills or tranquilizers is unrelated to time constraints before 40; but
after 50, two and a half times more women consume psycho-active substances among the employees who claim they “often have to hurry”, as compared to others.

To further extend these studies four questions could be raised in our view to clarify the consequences of an adequate or inadequate adjustment between intensified time constraints and the ageing of labour. The statistical analyses presented in this paper will be based on these four questions and are entirely related, as mentioned, to work and health of employees over 50:

- Evidence, frequently noted in scientific literature, of age-related selection mechanisms due to time pressure, calls for a verification of any visible trace of these mechanisms in the population over 50; in other words, have part of these employees been removed from time pressure situations?
- As shown, the existence of physiological or psychological deficiencies, or the change in behaviour with age can imply specific difficulties in coping with time constraints; it may therefore be useful to assess the extent these difficulties are perceived as such by employees: is time pressure difficult to deal with for older workers (from their point of view)?
- The fact that epidemiological studies on relations between time pressure, age, and health are relatively rare justifies questioning not only the difficulties perceived (see previous point), but also the implications in terms of health disorders: does intense time pressure imply increased prevalence of certain health disorders among senior employees?
- Finally, in the present context of pension scheme reforms and the foreseen extension of professional life in many countries (France in particular), it is legitimate to determine whether time pressure is one of the work characteristics that are likely to influence behaviours leading to cease being active: does pressure increase the desire to end one’s professional life early?

3. Survey method

These 4 questions have been treated on the basis of the SVP50 (Sante´ et Vie Professionnelle apre`s 50 ans: Health and Professional Life After 50) survey carried out in 2003 by the CISME1 epidemiology group in conjunction with CREATP2 researchers (Pommier et al., 2006).

The survey was launched to meet three combined requirements:

- An economic requirement, i.e. the need for a pension scheme reform
- A demographic requirement resulting from the increase of aged employees in companies
- An operational requirement due to the increasingly pressing difficulties faced by occupational physicians to maintain ageing employees in their jobs. In France, each employee must be seen by an occupational physician who will determine whether or not, from a health point of view, he or she is capable of continuing his or her professional activity.

This survey was intended to examine the health and work challenges faced by workers from age 50 years onward in all sectors of activity, determine their wish to remain at work or leave, and explore their past and present working conditions, their perception of retirement, and their state of health.

3.1. Sample description

Because the survey was conducted by occupational doctors in charge of several enterprises, the sample shows a number of common features regarding the general population at work. The employees belong essentially to the private sector excluding agriculture; there are very few public sector workers and no large enterprise employees, large companies having their own occupational doctors as mentioned earlier.

The sample therefore comprises 11 213 employees from 50 onward distributed per age and gender as is shown in Graph 1 which highlights a large number of early retirements, before the legal retirement age.4

If the sample is expressed per socio-professional category, the distribution is as follows (Graph 2).

The main features of this distribution are common in inter-professional samples: there are more office employees and operators than management and middle-management staff; office employees are the only category in which women prevail.

3.2. Questionnaire

The questionnaire was completed by the individuals themselves on a volunteer and anonymous basis (just before the visit in most cases) and supplemented by a questionnaire completed by the physician.

Different aspects were covered. In addition to socio-demographic facts, the workers’ questionnaire explored a number of issues: main characteristics of past and present work, their duration and the fact that workers considered them to be difficult or painstaking; interruptions in their career, and important changes occurred, in order to retrace as closely as possible professional courses; individuals were asked to comment on the quality and contents of their work, their activities outside work, their motivations to retire earlier or later than the date at which they were entitled to a full-rate retirement, and finally, their health problems.

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1 Centre interservices de sante´ et de medicine du travail en entreprise (Interdepartmental Center for Health and Occupational Medicine in enterprises).
2 Centre de recherches et d’e´tudes sur l’age´ et les populations au travail (Center for Research and Studies about Age and Populations at Work).
3 In France, occupational medicine represents large enterprises through “autonomous” departments and small and medium size enterprises through common inter-enterprise departments. The latter cover 95% of employees in the private sector and are coordinated by the CISME. Therefore the sample of the SVP50 survey does not include employees in the largest enterprises.
4 Age 60 in France.
at the time of the survey, the aggravation of such problems in the last few years and the trouble these disorders caused them at work.

The doctor, on his part, was to mention the pathologies, disabilities, aptitude restrictions noted, the possibility for workers to be included in specific early retirement schemes. He was finally to report, regardless of any official opinion on the worker’s aptitude, whether it was desirable for the individual to cease work.

3.3. Choice of data selected for this analysis

For occupational physicians, pressure at work is a recurring issue. Indeed, during the interviews they conduct with workers at the medical centre, when the question of work is raised, it is most unusual not to hear a single comment such as “I don’t have time”, “I can’t manage to do this fast and well”. This perception of a situation “under pressure” has an impact on health. Clinical observations reveal situations of pain at work, discomfort, sleep disorders... or even the emerging of pathologies such as musculoskeletal disorders or high blood pressure. In the SVPS50 questionnaire, this was considered as the central question for our study, based on the item defined as follows: “Do you work or have you worked “under pressure” (fast paces, short deadlines, constant interruptions, having to respond immediately to a request...)? If so, for how long (less than 10 years, 10–20 years, over 20 years)? Is it or was it difficult or strenuous?”.

Time pressures are very common and the context in which they appear must be explored to better cope with the impact they may have on health. For this reason we included in our analysis other work characteristics, for which questions were phrased identically. These characteristics concern staggered work shifts, physically demanding work, complicated work, psychologically difficult work, dangerous work. All of these constraints in combination with time pressure may risk compounding negative impacts on health.

We also felt it was important to add items on the comments of individuals on their job, asking in particular whether or not: they could choose the way to do things, they had the means to do quality work, their job was varied, their job allowed them to learn. These items give us insight on psychosocial factors. All of these determinants in association with time pressure combine differently for each work situation. Moreover, a combination of negative factors as well as time pressure can have a significant bearing on health.

To explore health we selected different items such as the health disorders mentioned by workers: pains, fatigue, difficulties in recovering, sleep disorders, digestive disorders, sight disorders, hearing disorders, difficulties with certain gestures, nervousness, sense of discouragement, difficulty coping with events. These disorders allow to study the health aspect taking into consideration sub-pathologies, which are far more common in work environments than proven pathologies because of the harsh selection effect that working conditions may cause, when their impact on health is such that the most affected workers cannot retain their job.

To provide a more complete picture of this health aspect at work, we have chosen a few criteria relating to the implications of health disorders described earlier, such as visits to doctors, medication, the sense of a health condition that has deteriorated over the past few years.

We also felt it was important to determine, for this population of older workers, the link between time pressure and intended retirement age; this paper will mainly refer to early retirement intentions (among workers aware of the age they will be entitled to a full-rate retirement pension).

Finally, the precariousness of the work situation, which is a growing trend, was taken into account based on two variables: first, the risk of losing the job, and second, an important change in the work situation in the past five years leading to a situation perceived as “rather worse” or “considerably worse”.

SAS software (8.2 version) was used for each of the statistical analyses mentioned in this paper.

4. First sub-question: have part of these ageing workers been moved away from situations involving time pressure?

In this part of our analysis, we intend to check the existence of age-related selection mechanisms, and especially mechanisms linked to time pressure at work, such as those described in several studies stated in the introduction. To answer this question we will first examine the relationship between the number of workers subjected to this or that constraint at work “in the past but not longer at present” and the entire population of those exposed at present or in the past to such a constraint. These ratios that we will call proportions of “removed” workers indicate the magnitude of the selection processes associated with each type of constraint. A high ratio of exposed individuals has moved away from such constraints either before 50 or at the latest between 50 and their present age. We shall see how the time pressure ratios compare to other job demands.

In contrast, we will then examine what we term as “late discoveries” of a constraint – in particular time pressure: such “discoveries” are reflected by the fact that an older worker is presently exposed but has only been exposed for a few years (less than 10). Finally, assuming that if selective mechanisms come into play, they may be perceived even during the period between 50 and 60, we will compare the level of exposed workers in their 50s, by age grouping years two by two: a selection process should be reflected by a marked drop in the percentage of exposed individuals, even after 50.

4.1. Results

For the entire sample, 39% of men and 36% of women claim to “work under pressure”. In Graph 3, we present the percentages of “removed” workers, respectively for men and women, specifying the magnitude of selection processes associated with different work constraints. For work “under pressure”, the proportion of individuals who have moved away from it is significant (around 2/5 of men and women who had been exposed to it at one point or another) though it is not the majority. “Being removed” from pressure is less frequent than from physical demands, exposure to danger, or staggered shifts.

Another result reinforces the previous remark. It is not unusual among individuals presently exposed to work under pressure to find “recent discoveries” of this constraint (Graph 4). 21% of male workers age 50 and over, and 27% of female workers, report having been working under pressure for less than 10 years, which means that they have been confronted with this situation recently, once they were more than midway into their professional life.
number of those who were removed from constraints as appears
above is therefore offset by a fairly significant number of “recently
exposed”, even after 50.

A final element supports the idea whereby “pressure”-related
selection mechanisms are by no means systematic. If a selection
developed overtime there would be little reason for it to cease at age
50. The proportion of workers “under pressure” would thus
decrease regularly between 50 and 60. Now this decrease is very
moderate and appears above all at a late stage (Graph 5). In the
male population it only becomes clear after 60. The female pop-
ulation even shows a slight increase between 50 and 55 and then
a gradual decrease.

4.2. Discussion of this first sub-question

From this first series of results, it appears that selective mecha-
nisms – whereby individuals are removed from work under
“pressure” as they age – are not evidenced as sharply as one could
have expected. This observation induces several possible inter-
pretations that the data in the survey cannot further elicit. One
could either surmise that the concept of ”pressure” used here is
broad; that is why the related selective processes are less apparent
than if understood more strictly as in other research studies
(repetitive work under tight time constraints, for example). Or one
could assume that the trend toward an intensification of work has
reached such proportions that “protect” the senior workers (whose
number is rising) is a less manageable solution than in the past. One
could finally imagine that part of the selection has resulted in
workers leaving their job. These three explanations are not
incompatible with each other.

5. Second sub-question: is time pressure difficult to cope with
for older workers (from their point of view)?

We now intend to determine whether the strategies to cope
with time constraints developed by the elderly are efficient enough
or not to overcome the difficulties due to the age-related charac-
teristics of their physical and cognitive performance. Therefore we
contemplate the answers to the question: “Is it difficult or stren-
uous?” which completed each one of the queries on the present
work constraints.

After reviewing the percentage of positive answers for various
constraints (including pressure), we will explore the role of other
characteristics, either personal or professional, in the presence or
absence of which pressure becomes more or less bearable. The role
of each of them will first be analysed, after which their specific role
will be determined by a multivaried regression.

Another way of exploring the “difficulty experienced” is to study
the case of individuals confronted with an “important change in
their work situation in the past five years”. These employees were
asked to compare the new situation with the previous one. It is
therefore interesting to know whether there is a statistical link
between these “late discoveries” of pressure (see previous para-
graph) and the experiencing of a professional change with nega-
tively perceived consequences.

5.1. Results

For both men and women, all the constraints studied in the
questionnaire are mostly described as “difficult or strenuous” by
workers currently exposed to such constraints. The percentage of
answers reporting a perceived difficulty or strenuousness varies
however according to the type of constraint (Graph 6). It is
particularly high (almost 80%) for three constraints: physically
demanding work, psychologically demanding work, and work
“under pressure” – whereas the percentages are lower for stagg-
ered shifts, complicated, or dangerous work.

If the answers on the “difficulty” of pressure are now crossed
(among the currently exposed) with a series of other variables,
a significant effect is noted (p < 0.0001, in the sense of an increase
in difficulties reported) in variables as diverse as female gender,
category of blue collars, physical or psychic demand, lack of variety
at work or learning opportunities, lack of means to do a proper job,
or risk of losing the job. By choosing these variables to account for
the sense of “difficulty” (in a multivariate logistic regression,
Table 1) odds-ratios can reach 1.3 for the effects of physical hard-
ship; 2.3 for the risk of job loss; and up to 4.5 for a very negative
response on the “means to do a proper job”.

Finally we will examine the case of employees who have
experienced a change they consider harmful in their job. 20% of
men, and 19% of women out of the entire sample have been through
an important change in the past five years leading to a situation
deemed as “rather worse” or “clearly worse”. If you then look at the
workers for whom time was a “late discovery” (those who are
presently exposed, but have been so for less than 10 years) it
appears that the changes perceived as harmful concern 36% percent
of the male population, and 32% percent of the female population.
5.2. Discussion of this second sub-question

That "pressure" is often negatively perceived does not mean it will always be the case. Pressure can characterize a very demanding but stimulating job (Baudelot and Gollac, 2002) to the point that in some cases – such as emergency doctors, firefighters, maintenance technicians, personal assistants – it is a feature of professional identity. All may depend on the presence or absence, in the same work situation, of other more or less taxing constraints.

The results presented here thus confirm the fact that many variables can play an "aggravating" role in coping with pressure. The main one is "the absence of means to do a proper job".

Table 1
Factors explaining the probability of finding the current exposure to a job "under pressure" difficult, for those concerned.

<table>
<thead>
<tr>
<th>Explaining variables</th>
<th>Odds-ratio a</th>
<th>Confidence interval b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (ref. men)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>1.1</td>
<td>[0.9, 1.3]</td>
</tr>
<tr>
<td>Age (ref. 50-51 years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52–53 years</td>
<td>1.0</td>
<td>[0.8, 1.3]</td>
</tr>
<tr>
<td>54–55 years</td>
<td>1.2</td>
<td>[1.0, 1.5]</td>
</tr>
<tr>
<td>56–57 years</td>
<td>1.0</td>
<td>[0.8, 1.3]</td>
</tr>
<tr>
<td>58–59 years</td>
<td>0.9</td>
<td>[0.6, 1.2]</td>
</tr>
<tr>
<td>60 years and over</td>
<td>0.9</td>
<td>[0.6, 1.4]</td>
</tr>
<tr>
<td>Socio-professional category (ref. management)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervisory-middle management</td>
<td>1.8**</td>
<td>[1.4, 2.2]</td>
</tr>
<tr>
<td>Office employees</td>
<td>1.7**</td>
<td>[1.3, 2.1]</td>
</tr>
<tr>
<td>Operators</td>
<td>2.0**</td>
<td>[1.5, 2.6]</td>
</tr>
<tr>
<td>Staggered shift work (ref. never)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At present</td>
<td>1.1</td>
<td>[0.8, 1.4]</td>
</tr>
<tr>
<td>In the past but no longer at present</td>
<td>1.3*</td>
<td>[1.0, 1.6]</td>
</tr>
<tr>
<td>Physically demanding work (ref. never)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At present</td>
<td>2.0**</td>
<td>[1.6, 2.5]</td>
</tr>
<tr>
<td>In the past but no longer at present</td>
<td>1.3*</td>
<td>[1.0, 1.6]</td>
</tr>
<tr>
<td>Having a diversified job (ref. yes absolutely)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rather yes</td>
<td>1.0</td>
<td>[0.9, 1.3]</td>
</tr>
<tr>
<td>Rather no</td>
<td>1.1</td>
<td>[0.8, 1.6]</td>
</tr>
<tr>
<td>Not at all</td>
<td>0.9</td>
<td>[0.6, 1.4]</td>
</tr>
<tr>
<td>Having a job with learning opportunities (ref. yes absolutely)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rather yes</td>
<td>0.9</td>
<td>[0.8, 1.2]</td>
</tr>
<tr>
<td>Rather no</td>
<td>0.9</td>
<td>[0.7, 1.2]</td>
</tr>
<tr>
<td>Not at all</td>
<td>1.2</td>
<td>[0.8, 1.8]</td>
</tr>
<tr>
<td>Having the means to do quality work (ref. yes absolutely)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rather yes</td>
<td>1.6**</td>
<td>[1.3, 1.9]</td>
</tr>
<tr>
<td>Rather no</td>
<td>2.9**</td>
<td>[2.3, 3.6]</td>
</tr>
<tr>
<td>Not at all</td>
<td>4.5**</td>
<td>[2.6, 7.5]</td>
</tr>
<tr>
<td>Being able to choose the way to operate (ref. yes absolutely)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rather yes</td>
<td>1.4**</td>
<td>[1.1, 1.6]</td>
</tr>
<tr>
<td>Rather no</td>
<td>1.7**</td>
<td>[1.3, 2.3]</td>
</tr>
<tr>
<td>Not at all</td>
<td>1.4**</td>
<td>[1.0, 2.0]</td>
</tr>
<tr>
<td>Risk of job loss in forthcoming years (ref. non existent)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>1.0</td>
<td>[0.8, 1.2]</td>
</tr>
<tr>
<td>High</td>
<td>1.1</td>
<td>[0.9, 1.4]</td>
</tr>
<tr>
<td>Very high</td>
<td>2.3**</td>
<td>[1.5, 3.5]</td>
</tr>
</tbody>
</table>

- ** If the OR is significantly different from 1 with 1% risk of error, *if the risk of error is 5%.
- ** If the OR is significantly different from 1 with 1% risk of error, *if the risk of error is 5%.

Therefore when the quality of the job is deeply challenged, "pressure" is particularly hard to cope with. It should however be stressed that even without "aggravating" variables, positive answers on the "difficulty" of pressure are given by a vast majority of these workers in their fifties.

This is confirmed by the results in changes occurred at work, which suggest that a large part of the changes perceived negatively by this population in its fifties could be characterized by a sudden intensification of time pressure at work.

6. Third sub-question: does intense time pressure imply a higher prevalence of certain health disorders?

Our purpose now is to analyse the links between time pressure at work and various health disorders in the most recent years period of the professional course. According to former studies mentioned in the introduction, and in relation to the "difficulties" considered in the former paragraph, we expected to find significant levels of relative risks. Therefore we first compared, one by one, the answers on the different aspects of health perceived, as well as those on doctors' visits and medication intake, breaking down the "pressure" variable as follows: "never" pressure, "past" pressure, "present" pressure, distinguishing in the last case whether it is perceived or not as "difficult or strenuous".

We then sought to determine whether there was still a marked effect of pressure on health when elements referring to autonomy and self-development at work were used as explanatory variables, following an approach inspired by the Karasek and Theorell (1992) analysis model on "job strain". It is known that the two first dimensions of their model correspond respectively to the "job demand" and the "job latitude". Crossing these two dimensions defines the scope of four situations qualified respectively as "passiveness" "activeness" "low tension" and "high tension", the latter (high job demand and little job latitude) being particularly harmful. The survey questionnaire did not reproduce Karasek and Theorell's items. However we suggest, as a rough approximation, to use "pressure" as a major component of "job demand". To determine the "latitude", several variables of our questionnaire could be selected; we are presenting here the results yielded by the variable "you can choose your own way of operating" where the answers are divided into "yes entirely" or "rather" on one side, and "rather not" or "not at all" on the other.

6.1. Results

By crossing the answers on various aspects of health with the "pressure" variable, the results are as follows in Table 2 below.

The main point noted is an increased number of each disorder for workers exposed to "pressure" (comparison between the first and last column). Though for eyesight and hearing the difference is moderate, it is clearly marked for the other perceived health items: in the neuropsychological sphere evidently (fatigue, sleep, discouragement, …) but also for several physical health aspects (pain, digestion). However the difference isn't striking in the number of doctors' visits or the medication intake.

Where pressure is described as "not difficult to cope with" (which is the case for about 1/5 of the workers concerned) the health condition does not appear to be very different from that of non exposed workers (comparison between the first and third column), and prevalence of some of the disorders is lower as the rates for doctors' visits and medication intake.

Finally, to take into account autonomy at work, four quadrants are presented in Graph 7 where the scope of quadrants is defined by positive or negative answers on "pressure" and the "way to operate". For each quadrant we indicate the levels of four health disorders, closely related to "pressure" as shown in the above analyses: pain,
sense of discouragement, sleep disorders, and difficulty to recover. In Graph 7a these levels are indicated in the form of prevalence. In Graph 7b, odds-ratios were calculated based on logistic multivariate regressions in which a four modality variable, made up by crossing “pressure” with “way to operate”, is set against several control variables: age, gender, socio-professional category, work schedules, “pressure” with “way to operate”, is set against several control variables: age, gender, socio-professional category, work schedules, and corresponding odds-ratios are the highest. The odds-ratio for the “sense of discouragement” is set against several control variables: age, gender, socio-professional category, work schedules, and corresponding odds-ratios are the highest. The odds-ratio for the “sense of discouragement” as compared to the reference situation (northwest quadrant, corresponding to a “low tension”).

It is also interesting in these graphs to compare the results in the southwest and northeast quadrants which can also be set against the situations of “passiveness” and “activity” respectively in Karasek and Theorell’s model. This comparison will rather be to the advantage of “activity” with smaller odds-ratios for pain, discouragement, or difficulty to recover than those in the “passiveness” situation – whereas, in contrast, it raises somewhat more problems in terms of sleep disorders (even though, in such comparisons, most of the confidence intervals overlap).

This graph is to be read as follows: among the individuals who can choose the way they operate and are exposed to pressure, 62.2% experience pain. The odds-ratio for pain in this category of individuals is 1.18, compared to the “reference” situation (people who can choose the way they operate, and are not exposed to pressure).

6.2. Discussion of the third sub-question

Table 1 shows that a large part of health disorders associated with pressure reveal a certain “discomfort” amongst this population in its fifties, though they may not (or not yet) appear as diagnosed pathologies and do not (or not yet) entail any particular medical treatment. These links between “pressure” and health disorders should not necessarily be interpreted in terms of pathogenic effects: it could be the reverse, i.e. a health deterioration, whatever the cause, leading to a clearer perception of “pressure” at work. Still, the convergence between our results and the knowledge summarised above on the effects of pressure among older workers, suggests resorting to a “direct” interpretation of the links observed, which implies an increased prevalence of health disorders as a result of intense time pressure.

On the other hand, if the analysis is limited to the employees exposed to pressure but who do not consider it “difficult,” their

Table 2
% of workers with health disorders according to exposure to “pressure”.

<table>
<thead>
<tr>
<th>% of these disorders [confidence interval]</th>
<th>Never pressure (A)</th>
<th>Past pressure (B)</th>
<th>Present pressure not difficult (C)</th>
<th>Present pressure difficult (D)</th>
<th>Present pressure (C or D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>52.8 [51.2, 54.4]</td>
<td>64.9 [63.1, 66.7]</td>
<td>45.7 [42.0, 49.4]</td>
<td>70.9 [69.3, 72.5]</td>
<td>65.6 [64.1, 67.1]</td>
</tr>
<tr>
<td>Fatigue</td>
<td>43.1 [41.5, 44.7]</td>
<td>55.4 [53.6, 57.3]</td>
<td>31.1 [29.6, 36.6]</td>
<td>69.6 [66.9, 70.2]</td>
<td>61.5 [60.0, 63.0]</td>
</tr>
<tr>
<td>Difficulty to recover</td>
<td>33.5 [32.0, 35.0]</td>
<td>46.8 [44.9, 48.7]</td>
<td>27.1 [23.9, 30.4]</td>
<td>60.8 [59.1, 62.5]</td>
<td>54.2 [52.7, 55.8]</td>
</tr>
<tr>
<td>Sleep disorders</td>
<td>35.3 [33.8, 36.8]</td>
<td>48.1 [44.3, 48.0]</td>
<td>34.9 [31.4, 38.4]</td>
<td>55.0 [53.2, 56.8]</td>
<td>51.2 [49.6, 52.7]</td>
</tr>
<tr>
<td>Eyesight disorders</td>
<td>55.7 [54.1, 57.3]</td>
<td>61.7 [59.9, 63.5]</td>
<td>55.8 [52.1, 59.5]</td>
<td>64.2 [62.5, 65.9]</td>
<td>62.4 [60.9, 63.9]</td>
</tr>
<tr>
<td>Memory disorders</td>
<td>24.1 [22.7, 25.5]</td>
<td>34.4 [32.7, 36.2]</td>
<td>22.0 [19.0, 25.1]</td>
<td>40.4 [38.7, 42.2]</td>
<td>36.8 [35.3, 38.3]</td>
</tr>
<tr>
<td>Difficulty with certain gestures</td>
<td>26.9 [25.5, 28.3]</td>
<td>38.2 [36.4, 40.0]</td>
<td>22.3 [19.2, 25.4]</td>
<td>43.8 [41.2, 45.6]</td>
<td>39.4 [37.9, 40.9]</td>
</tr>
<tr>
<td>Nervousness</td>
<td>30.0 [28.5, 31.4]</td>
<td>38.2 [36.4, 40.0]</td>
<td>33.2 [30.8, 35.7]</td>
<td>57.7 [56.0, 59.5]</td>
<td>53.1 [51.5, 54.6]</td>
</tr>
<tr>
<td>Doctors’ visits</td>
<td>47.5 [45.9, 49.1]</td>
<td>53.3 [51.4, 55.1]</td>
<td>39.6 [36.0, 42.2]</td>
<td>53.5 [51.7, 55.3]</td>
<td>50.8 [49.3, 52.4]</td>
</tr>
<tr>
<td>Medication intake</td>
<td>45.5 [43.9, 47.1]</td>
<td>49.9 [48.1, 51.8]</td>
<td>40.6 [37.0, 44.2]</td>
<td>52.4 [50.7, 54.2]</td>
<td>50.0 [48.5, 51.6]</td>
</tr>
<tr>
<td>Health deterioration in the past years</td>
<td>22.3 [21.0, 23.7]</td>
<td>34.6 [32.8, 36.4]</td>
<td>16.1 [13.3, 18.8]</td>
<td>47.0 [45.2, 48.8]</td>
<td>40.7 [39.2, 42.2]</td>
</tr>
</tbody>
</table>

Graph 7. a and b: way to operate and present pressure.
health condition is not much different from that of “unexposed” to pressure. Several interpretations are possible here, and most likely complementary. One might think of the indirect effect of a selection mechanism: part of the workers whose health is fragile have avoided from the outset work situations “under pressure”. This increases the prevalence of such disorders among the “never exposed”. The “inverse causality” mentioned in the previous paragraph can also be invoked: workers in good health are more likely to find “pressure” bearable. One might also consider a division between situations where pressure is more or less pathogenic, depending on how favourable other work characteristics are.

This third interpretation is supported by the four quadrant analysis of Graph 7. These results confirm that the room for manoeuvre to develop their own strategies is an extremely precious resource for ageing workers, although they can only partly offset the pathogenic effects of intense pressure.

7. Fourth sub-question: does an intense time pressure heighten the desire to retire from professional life early?

The results of the previous paragraphs regarding the large number of workers interviewed who feel that “pressure” is hard to bear, the high prevalence of their health disorders, or their relative difficulty in guarding themselves from this constraint without leaving their job, could have led to predict that a large proportion of employees in their fifties “under pressure” intended to shorten their professional life. To deal with this last sub-question, we first crossed exposure to pressure with the questions concerning the workers’ intentions as to the age they wish to retire. These calculations are made for the population of workers aware of the age they reach their “full rights”, i.e. about 70% of the sample.

We then sought to ascertain whether these comparisons showed a specific effect of “pressure” or whether other variables, associated both with “pressure” and early departure intentions could come into play. Once again we carried out a multivariate regression where the explained variable was the departure intention, and the explanatory variables were “pressure”, of course, but also items whose relation with these departure plans (Volkoff and Bardot, 2004) or with the impression of being able to remain in the job until retirement (Moliné, 2005) had been shown, such as: gender and age, work schedule constraints, physical and psychological demands, having the means to do a proper job, age at which “full rights” to a pension are granted (the later it is reached, the greater the number of early departure intentions), the risk of job loss, and a few health condition characteristics (pains, fatigue, discouragement).

7.1. Results

26.8% of the employees who claim to work “under pressure” and find it “difficult or painstaking” plan to cease their professional activity before reaching the age of full pension rights, and 14.7% intend to work beyond that age which shows differences compared with the percentages for workers never exposed to pressure: respectively 19.3% and 16.1% (Table 3). It appears, however, that even for those who are “under pressure” and find it “difficult”, only a minority intend to retire earlier and those who intend to remain beyond the age full pension rights are reached are not marginal.

When the above variables are introduced in a multivariate regression the specific effect of the exposure to “pressure” on the intention to retire early is reflected by a 1.11 odds-ratio (in comparison with the workers never exposed) which is non significant. This odds-ratio rises to 1.18, equally non significant, if it only applies to pressure perceived as “difficult”. The relationship is clearer if the analysis excludes certain parameters whose presence could be partly attributed to “pressure”: psychological load, pains, or fatigue. The odds-ratio will then be 1.23 ($p = 0.006$).

7.2. Discussion of this fourth sub-question

The multivariate regression we have just mentioned leads to consider that “pressure” at work does not have a powerful effect on the project of ceasing one’s activity. It may be assumed that the prime considerations in such projects are regulatory and financial. On the other hand, as another analysis in the same survey showed (Volkoff and Bardot, 2004), the determining variables of early retirement intentions are rather the ones that characterise the interest and meaningfulness of the job: the possibility of learning at work, the sense of “keeping with it” thanks to one’s job, etc. If such requirements are met, “pressure” will not suffice in itself to generate the desire of escaping the work.

8. General discussion and conclusions

The size of the sample in the survey we are using here allows for detailed analyses and sound comparisons, but we must not forget to recall the methodological limits of this study. Its scope excludes, as mentioned, the civil servants and staff in large enterprises.

The interviewing doctors were volunteers, which may guarantee the quality of the interviews but does not necessarily ensure a representative sample of the population of employees. However, the large number of workers and the diversity of professions represented enable us to consider that our main conclusions could also apply to a strictly representative sample.

Another methodological difficulty stems from the appreciation of “pressure”, based on the point of view of the employee interviewed and asked, furthermore, a single question. We sustain however the idea that “pressure” and the “feeling of pressure” at work are two concepts that are difficult to differentiate. More objective measurements of time constraints can no doubt be contemplated, but they do raise intricate technical problems as pointed out by Green and McIntosh (2001) for the “Percentage Utilisation of Labour” in the United Kingdom. Besides, workers do not have access to such evaluations which may not necessarily be more relevant than a subjective appreciation to measure the effect of time constraints on work activity, health and well-being.

The very choice of “time pressure” as a major component of the job demand could also be challenged. The important distinction drawn by Kristensen et al. (2004) between “intensive” (pressure) and “extensive” (amount of working hours) forms of quantitative demands at work, should apply here. As the authors note in their critical analysis of “scores”, both aspects of the workload can appear to match – if only because one of the ways of coping with pressure for some workers may be to work overtime regularly – but their respective health effects are not equivalent. Here the intensive job demand approach was preferred because scientific literature on ageing at work (mentioned in the first part of this paper) contains a large amount of concurring results showing how this pressure confronts older workers with particular difficulties.

<table>
<thead>
<tr>
<th>In relation to the official retirement age, intend to: →</th>
<th>Retire before</th>
<th>Retire at age</th>
<th>Retire after</th>
<th>No opinion</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>If no pressure ever</td>
<td>19.3</td>
<td>46.0</td>
<td>16.1</td>
<td>18.0</td>
<td>100</td>
</tr>
<tr>
<td>If past pressure</td>
<td>21.5</td>
<td>43.1</td>
<td>16.6</td>
<td>18.2</td>
<td>100</td>
</tr>
<tr>
<td>If present pressure not difficult</td>
<td>17.1</td>
<td>42.7</td>
<td>22.2</td>
<td>18.1</td>
<td>100</td>
</tr>
<tr>
<td>If present pressure difficult</td>
<td>26.8</td>
<td>42.6</td>
<td>14.7</td>
<td>15.4</td>
<td>100</td>
</tr>
</tbody>
</table>

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Finally, among the methodological precautions, the fact that the survey exclusively addressed the population of age fifty and onward should also be stressed. When we drew conclusions that seemed to reflect specificities of ageing workers, we had no points of comparison here allowing us to prove it. Only convergences with the scientific literature on ageing workers entitled us at times to insist on this possible specificity.

Having made these reservations, we would like to reiterate a concern that the results as a whole have contributed to reinforce. The survey shows that intense time pressure raises serious problems for most of the employees in their fifties who are exposed to them. 80% consider this constraint to be “difficult”. They systematically show more frequent rates for most types of physical or psychological health disorders. Medical follow-up and treatment of such disorders is not particularly common and nothing can allow us to believe that this might be the solution to recommend. “Sheltering from the job” which implies being shifted from work “under pressure” to a job “without pressure” is not uncommon but only solves a minority of situations, because at the same time other employees in their fifties “discover” heavy time constraints that are new to them. Lastly, the option of early retirement is not especially foreseen in age group in its fifties working “under pressure”. These conclusions refer us back to the contradiction we pointed out at the beginning of this paper. In light of the social debate on the end of active life and the recommended extension of professional careers, time constraint issues raise a particular problem. While it is often accepted that heavy physical workloads or exposure to certain nuisances, or night shifts, may entitle workers to job reassignments or recycling when they are in their fifties, and/or to early retirement, at least for those whose health may have become fragile as a result of a strenuous professional life, no such option is foreseen or planned as for the intensity of work. We have seen here that other work characteristics can be acted upon (room to manoeuvre should be preserved in particular) to mitigate the harmful effect of time pressure on both the difficulties perceived and health. However, it is justified to call for a more general reflection on the organisation model which should prevail in production systems. The ageing of labour could afford an opportunity to examine even more closely the perspective raised by European scientists in various fields (Shani et al., 2002) where the primacy of intensity should gradually give way to “sustainable work systems”. These would enable health and skills to be maintained and constructed throughout each and everyone’s professional course. If ageing led us to further reflect along those lines, it could be a benefit to workers of all ages.

References

Kristensen, T., Bjorner, J.B., Christensen, K.B., Borg, V. 2004. The distinction between work pace and working hours in the measurement of quantitative demands at work. Work & Stress 18 (4), 305–322.

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