



University Professors' Stress and Perceived State of Health in Relation to Teaching Schedules

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Abstract

Introduction. The aim of this research is to analyze the influence of time management, particularly in connection with university teachers' assigned class hours, on psychosocial factors relating to perceived health and stress symptoms. Special attention is given to the effect of very early and very late class hours.

Method. The sample comprised 172 professors from the Polytechnic University of Catalonia (99 men and 73 women). A Spanish version of the ISTAS21 was used.

Results. Professors whose classes were held in the early morning or late evening hours reported a less healthy perception of themselves and a larger number of stress symptoms. Results showed no difference related to gender, but significant differences were found in the gender-teaching shift interaction. Early/late class hours show a stronger effect on females.

Discussion and Conclusions. A university professor's possibilities to arrange his or her work time, and so balance work and personal life, have an impact in preventing illnesses and stress symptoms. It is not so much a question of general time management as the avoidance of time conflicts with highly valued personal activities. This effect is most notable in the women in our sample, who show a preference for a female social role that gives priority to family.

Keywords: university professors, health perception, stress, assigned teaching hours, gender role

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Percepción del estado de salud y estrés, de profesorado universitario, en relación con la franja horaria de docencia

Resumen

Introducción. El objetivo de este estudio es analizar de qué modo la gestión del tiempo de trabajo en función de la distribución horaria de la docencia de los profesores universitarios, influye en los factores psicosociales relacionados con la percepción de salud y los síntomas de estrés. Se ha considerado especialmente la incidencia de las franjas horarias extremas.

Método. La muestra consistió en 172 profesores de la Universidad Politécnica de Cataluña (99 hombres y 73 mujeres). Para evaluar los factores psicosociales se empleó la versión española del cuestionario de riesgos Psicosociales ISTAS21.

Resultados. Los profesores con una actividad docente a primera hora de la mañana y a última hora de la tarde presentan una peor percepción de salud y un mayor número de síntomas de estrés. Los resultados obtenidos no han mostrado diferencias significativas entre géneros, pero sí en la interacción entre género y la franja horaria. La franja horaria de docencia extrema tiene una peor repercusión entre el personal femenino.

Discusión y conclusiones. Las posibilidades que tenga un profesor universitario para gestionar su tiempo de trabajo, y de esta manera poder compatibilizar su vida laboral y personal, redundan en la prevención de enfermedades asociadas con la salud y el estrés. No se trata tanto de una gestión general de su tiempo sino de poder evitar solapamientos con actividades personales que valore. Este efecto ha resultado especialmente notorio en la muestra de mujeres por la existencia de un rol social preferentemente femenino, en el que la familia presenta una importante valoración.

Palabras Clave: profesores universitarios, percepción de salud, estrés, horario de docencia, rol de género.

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Introduction

The time dimension of human labor has often been included as a variable in sociological and economic perspectives, although its psychological dimension has not typically been included in studies from these disciplines. It is a relatively new variable in psychological investigation, first being considered in the 1970s in certain specific studies (Ghiselli, 1974; Katz, 1978a, 1978b; Katz & Van Maanen, 1977; Van Maanen & Katz, 1976, 1979). Since then, time has been studied increasingly as both an independent and dependent variable.

Specifically, time management is one fundamental dimension in contextualizing work activity. Although definitions of time management abound (for a review, see Claessens, Van Eerde, Rutte & Roe, 2005), at this time no consensus has been reached, such that the concept is being used with different shades of meaning in different studies. In this study we adopt one of the more generic definitions, taking time management to mean how people plan and make decisions that affect the beginning, duration and ending of their daily activities. This management is strongly determined by the perception of control over these activities.

The number of work hours, the pace of work, deadlines, imposed demands and time pressure for task execution, hours of the workday, different time aspects related to attention, distraction and other factors that influence performance or affect the organization, and the time management needed to carry out the tasks, taken as a whole, are a powerful context that not only modulates work productivity but, furthermore, affects workers' health (Cladellas, 2008; Fernández-Montalvo & Piñol, 2000). The study of psychosocial factors, such as workers' perception of their own health, forms part of the research on processes of work-related stress, and has also engaged the recent interest of institutions and businesses in the quality of work life that they offer their employees. Currently, aspects of work-related health are considered when assessing the effectiveness of a certain organization, since the quality of work life, and the state of physical and mental health that ensues, have repercussions on the institution and its productive activity, for example in absenteeism, turnover, decreased productivity or decreased quality (Boada, De Diego & Vigil, 2004).

The present study deals with the concepts of perceived state of health and stress from a psychosocial perspective. Perceived health is understood to be the individual's sense about his or her own state of physical, mental and social well being (Moncada, Llorens, Navarro & Kristensen, 2005). Work-related stress is the result of exposure to a high number of demands or psychosocial risk factors, such as cognitive demands, emotional demands, demands related to the pace of work or to responsibility, accompanied by few elements of control (job advancement, training, participation, autonomy, role, etc.) and low social support (Moncada, Llorens, Navarro & Kristensen, 2005).

Education is one profession whose working conditions and their repercussions have historically come under examination. Specifically, there have been many studies that investigate working conditions of the teaching profession and its physical and mental effects (Cladellas & Badia, 2010; Kyriacou, 2001; Moriarty, Edmonds, Blatchford & Martin, 2001; Troman, 2000; Woods & Carlyle, 2002). Despite the abundance of studies on the teacher's health and work-related stress, results are still quite difficult to integrate, perhaps because many of the studies have focused on concepts such as burnout (Aris, 2009; Marrau, 2004; Vera, Salanova & Martín, 2010), a syndrome that appears in response to continued work-related stress, and which may affect physical and mental health as well as the workers' social relationships (Grau, Suñer & García, 2005; Montgomery & Rupp, 2005; Taris, Peeters, Le Blanc, Schreurs & Schaufeli, 2001; Topa & Morales, 2005). One study from Spain (Guerrero, 2003) analyzed university teachers' degree of *burnout* and how they coped with teaching stress, and found that emotional exhaustion, depersonalization and lack of personal accomplishments were the main characteristics of the burnout syndrome. Other studies have shown that the teacher's personal resources and emotional variables play an important role in his or her work-related stress, while connections with age or amount of teaching experience were not found (Extremera, Fernández-Berrocal & Durán, 2003; Friedman, 2003).

Despite the number of studies that examine the main causes of work-related stress in teachers (López, 2000; López, 2009), very few have tried to relate time management to stress (e.g., Cladellas & Badia, 2010; Olivier & Venter, 2003; Saptoe, 2000). Specifically, these studies demonstrate that spending many hours at the educational institution results in an inability to flexibly organize one's own time, and therefore, personal elements of life lose their priority. This situation is a cause of work-related stress. Furthermore, in the study by Olivier and Venter (2003), differences are noted between men and women: women show greater

stress than men when faced with limitations on their time. This greater incidence of stress in women is explained by the existence of asymmetrical sociological roles in matters of home and family, where the female role is dominant, and time dedicated to work overlaps with time expected to be spent on domestic and family activities. In fact, there is remarkable concurrence of results in the pioneering studies by Greenhaus and Beutell (1985) and by Lewis and Cooper (1999), where conflicts between work and home especially impact women. More recent contributions expand the geographic and professional spheres where this relationship is taking place (Cinamon & Rich, 2002; Grzywacz & Bass, 2003; Kinnunen, Geursts & Mauno, 2004; McElwain & Korabik, 2005). Along these lines, the number of hours spent outside the home, although important, is not as relevant as whether these hours coincide with the time that the children are home. Therefore, in this framework, it may be considered that stress is triggered by the conflict of interests or priorities in the same time period. This is a lesser conflict in men, since their sociological role makes them less responsible for the domestic or family environment, giving greater weight to work activity. Consequently, since the conflict is reduced, repercussions in the form of stress are equally reduced.

Another study (Cladellas & Badia, 2010) used the questionnaire on psychosocial risks from the *Instituto Sindical de Trabajo, Ambiente y Salud* [Union Institute on Work, Environment and Health] (ISTAS-21) and revealed that teachers practicing face-to-face teaching present lower work satisfaction, a perception of poorer health, and a greater number of stress symptoms than teachers practicing distance learning or a combination. In this case, face-to-face teaching involves blocking out certain hours (class hours), thus affecting teacher's ability to manage their time and balance personal and professional spheres. As a whole, then, previous studies show that there is a general relationship between the lack of time flexibility (which impedes personal time management) and greater levels of stress, a relationship that is intensified particularly in cases where work time overlaps with other activities considered to be more important, thereby producing a greater conflict.

Based on these forerunners, our study seeks to understand how university teachers' opportunity to manage their own time affects psychosocial factors relating to health and stress. The new element in this study is the variable of day/evening teaching hours, which has not been studied to date. Within the face-to-face teaching situation, which prevails in the Spanish university context, the time of day devoted to teaching, more than how many hours, has a differential disruptive effect. The low number of face-to-face teaching hours in the uni-

iversity context is well known (Vera, Salanova & Martín, 2010), as compared to hours devoted to research and administration. But class hours are inflexible and certain teaching shifts present more overlaps with personal time, especially family time, while research and administrative activities are more flexible and therefore more compatible. The present empirical approach seeks to contribute new data towards promoting physical and mental health in university professors, as well as quality in their professional contributions.

Our objective, then, is to confirm the effect of teaching hours on psychosocial factors such as health and stress, since these hours determine the possibility of balancing personal and work interests. Keeping in mind that control of or influence over work hours as considered to be potentially positive aspects for work performance (Karasek, 1979) and the time pressure or limitation is a well-defined trigger of work-related stress (Briese-Neumann, 1997; Conte, Mathieu & Landy, 1998), teaching shifts that do not overlap with personal time would allow for time management (professional and personal) on the part of the professor, while schedules that involve more overlap would hinder such organizational autonomy and would become a stress factor.

Consequently, we propose the following hypotheses:

- 1) We expect to find poorer perceived health and greater stress-related symptoms in the group of teachers with outlying teaching hours (early morning and late evening), thus limiting their ability to balance work and personal time.
- 2) Differences are expected to be found in the perception of health and stress between male and female university teachers, where poorer values for health and greater stress will be found among female teachers.

Method

Participants

An incidental sampling was taken of university professors from three schools at the *Universidad Politècnica de Catalunya* [Catalonia Polytechnic University]. The sample comprised 172 university professors, of which 99 (65%) were men and 73 (35%) were women. Mean age was 44.45 (SD = 7.81) and ages ranged from 28 to 63. The mean number of years

of employment in the organization was 16.4 (SD = 6.77).

All professions in the sample had a full-time work contract. While the contract indicates 37.5 hours of work weekly for all university professors, including teaching, research and administration, the possibilities for arranging one's personal and work time varied depending on the teaching schedule assigned.

Instruments and variables

In order to assess psychosocial factors, the ISTAS21 questionnaire was administered (medium-length, Spanish version of the Copenhagen Psychosocial Questionnaire) (Moncada, Llorens, Navarro & Kristensen, 2005). The instrument is designed for any type of professional activity. It includes 21 work-related psychosocial dimensions – covering the widest possible spectrum of diversity in psychosocial exposure that may be found in today's work world – and six health and stress dimensions. The adaptation of this questionnaire has obtained excellent levels of validity, reliability and agreement between versions. Cronbach's alpha index falls between 0.65 and 0.92. The questionnaire presents agreement between versions with a Kappa index that falls between 0.64 and 0.89. As for construct validity, the main hypotheses of association among the 19 psychosocial and health-stress dimensions were successfully reproduced.

This study only considers answers provided on the six scales on health and stress dimensions (general health, mental health, vitality, behavioral stress symptoms, symptomatic stress symptoms and cognitive stress symptoms). These scales are composed of a total of 26 questions, and each question is rated using whole number values between 0 and 4.

General health: refers to a worker's perception of his or her health. A good state of general health is related to positive group sentiment, quality leadership, social support and predictability.

Mental health: refers to emotional health. Poor mental health may be the source of a series of negative health consequences, and of course it may complicate, aggravate or even be the direct cause of physical illnesses. In the workplace, poor mental health may be manifest in the form of absenteeism, poor relations with coworkers and customers, etc.

Vitality: Vitality means the positive far end of a spectrum that extends from exhaustion and fatigue to vitality and energy. The concept of vitality is something close to “zest for life” and as such it should be considered as an asset in its own right. However, the ISTAS-21 documentation itself indicates that very high vitality values have been found in correlation with a sense of burnout.

Behavioral stress symptoms: This scale pertains to different forms of behavior that are associated with stress in the relevant literature.

Somatic stress symptoms: Stress has physical (somatic) consequences. These manifestations include dry mouth, perspiration, stomach ache, muscular tension, quavering voice, heart palpitations and accelerated pulse. All these symptoms can be explained by physiological alterations that occur in the organism when mobilizing energy for “fight or flight”.

Cognitive stress symptoms: Besides symptoms of an emotional type (nervousness, irritability, anxiety, anger, etc.) most people also experience consequences in several cognitive (thought) processes. Such consequences may be very severe and sometimes catastrophic at work or outside work. Examples are bus drivers and train conductors, deadly decisions made in surveillance jobs (nuclear plants, air traffic), or erroneous management decisions made under situations of stress.

Reliability obtained for the sample on each subscale produced the following Cronbach Alpha indices: 0.69, 0.75, 0.72, 0.81, 0.77, 0.83.

Variables measured

Perceived Health. For health measurement, we used scales on general health, mental health and vitality: the general health scale has five statements, such as “I think my health is going to get worse”; the mental health scale has five questions, such as: “In general, over the past year, have you felt discouraged and sad?”; and the vitality scale has four questions, such as: “In general, during the past four weeks, have you felt exhausted?”. Scores for the 14 questions are totaled in order to offer a global score ranging from 0 to 56. High scores indicate a poorer perception of health.

Stress symptoms. In order to measure stress symptoms, we used three stress symptom scales: the behavioral stress symptoms scale, with four questions, such as: “During the past four weeks, how often have you been unable to sleep well?”; the somatic stress symptoms scale, with four questions, such as: “During the past four weeks, how often have you had headaches?”; and the cognitive stress symptoms scale, with four questions, such as: “How often, over the past four weeks, have you had trouble remembering things?” Scores for the 12 questions are totaled for global score ranging from 0 to 48. High scores indicate a greater presence of stress symptoms.

Biographic data: sex, age, number of daily teaching hours, distribution of daily teaching hours, and seniority in the institution were all obtained from the information provided directly by the teachers.

Procedure

Data collection was accomplished through administering a questionnaire during work hours. The researchers went to the different Engineering schools where the participants hold their classes. The questionnaire instructions were explained and confidentiality was assured. Participation in the study was entirely voluntary and individual. The process took place at the end of the second semester.

Assignment to groups

The teaching shift variable was based on the hours that participants carry out their teaching. Thus, we differentiated between those teachers with an early/late teaching shift and those with a regular day teaching shift.

Teachers with an early/late teaching shift. Over 50% of the teacher’s weekly classes were taught at early or late hours of the day. Early/late shifts included classes taught before 9:30 AM and/or after 5 PM. Some teachers had both early and late classes at least 2 days a week.

Teachers with a regular day teaching shift. All classes were taught between 10 AM and 5 PM.

Out of the initial sample of 208 teachers, 36 were excluded from the evaluation since they did not meet the specified criteria of either group.

Data analysis

The responses were subjected to multivariate analysis of variance. The partial eta-squared value (η_p^2) was obtained as a measure of the size of the effect, considering that a partial eta-squared value of 0.01 was small, 0.04 moderate, and 0.1 large (Huberty, 2002), and the observed potency statistic. Data analyses were carried out using the statistical package SPSS/PC+ (Version 15.0); the statistical tests were bilateral with a type I error variability of 5%.

Results

Preliminary analyses

Distribution of participants between the two groups according to teaching shift was 95 teachers with an early/late teaching shift, and 79 with a regular day shift. Proportion of men and women in each group is equitable ($\text{Chi-squared}_{(1,172)} = .027$; $p = .878$; $\eta_p^2 = .012$).

Table 1. *Number and percentage of teachers by gender and according to teaching shift*

	Early/late hours	Day shift	Total
Women	40 (55%)	33 (45%)	73
Men	53 (54%)	46 (46%)	99
Total	93	79	172

The two groups do not differ significantly in age [$F_{(1,172)}=.22$; $p=.637$; $\eta^2=.001$] or in years of experience [$F_{(1,172)}= 1.51$; $p=.221$; $\eta^2=.009$].

The minimum years experience among all the teachers evaluated was 5 years, so we can refer to the group as experienced.

Table 2. *Means and deviations of the variables age and experience, according to teaching shift*

Teaching shift	Age	Experience
Early/late hours	44.19 (8.31)	15.92 (7.06)
Regular day shift	44.76 (7.22)	17.19 (6.34)

Differences in stress and perceived health as a function of the teaching shift variable

Significant differences for the teaching shift variable appear in both the perceived health dimension [$F_{(1,172)}=7.34$; $p=.007$; $\eta^2=.042$] and in stress [$F_{(1,172)}=14.97$; $p=.000$; $\eta^2=.082$]. Early/late shifts present poorer perceived health and higher levels of stress than do day shifts.

Differences in stress and perceived health as a function of gender

No significant differences for the gender variable appear in the dimensions of perceived health and stress, although women show poorer results than men, as can be observed in Table 3.

Table 3: means, standard error, F-test, and observed potency for each of the dependent variables for the total sample, by gender and by teaching shift

		Perceived health	Stress
Total		18.94 (.22)	15.09 (.27)
Gender	Men	18.72 (.29)	14.72 (.35)
	Women	19.15 (.34)	15.47 (.40)
	F	.93	2.01
	Observ. Pot.	.16	.29
Teaching shift	Early/late shift	19.54 (.30)	16.12 (.36)
	Regular day shift	18.33 (.33)	14.07 (.39)
	F	7.34*	14.97**
	Observ. Pot.	.77	.97
Gender * Teaching Shift	F	5.32*	4.27*
	Observ. Pot.	.63	.54

Notes: *p < .05, **p < .0001

Significant differences appear in the interaction between teaching shift and gender in perceived health [$F_{(1,172)}=5.32$; $p=.022$; $\eta^2=.031$]. Figure 1 illustrates how women with early/late hours present poorer scores ($20.27 \pm .46$) than men ($18.81 \pm .40$); while the opposite occurs with regular day hours: men have slightly worse scores ($18.63 \pm .43$) than the women ($18.03 \pm .50$). As for intra-gender differences, it may be observed that women with early/late teaching shifts score 12.4% more poorly than women with a regular day shift, while this same difference is only 0.9 % in the case of men.

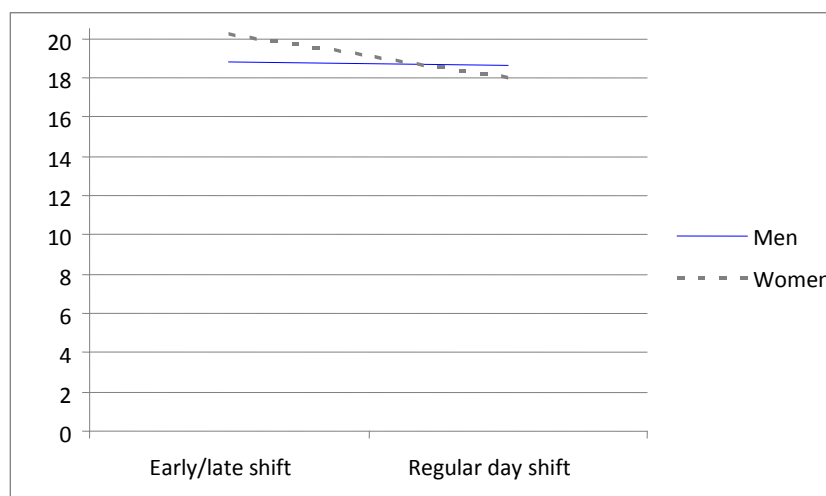


Figure 1. Graphic representation of the means obtained on the perceived health variable by gender and teaching shift

A similar pattern of variation can be seen for the stress variable [$F_{(1,172)}=4.27$; $p=.040$; $\eta^2=.025$]. Figure 2 shows how, for the early/late shift, women obtain poorer scores ($17.05\pm.54$) than men ($15.20\pm.47$); while on the regular day shift, men have slightly worse scores ($14.24\pm.51$) than women ($13.89\pm.60$). In this case, intra-gender differences are 22.8 % for women and 6.7 % for men.

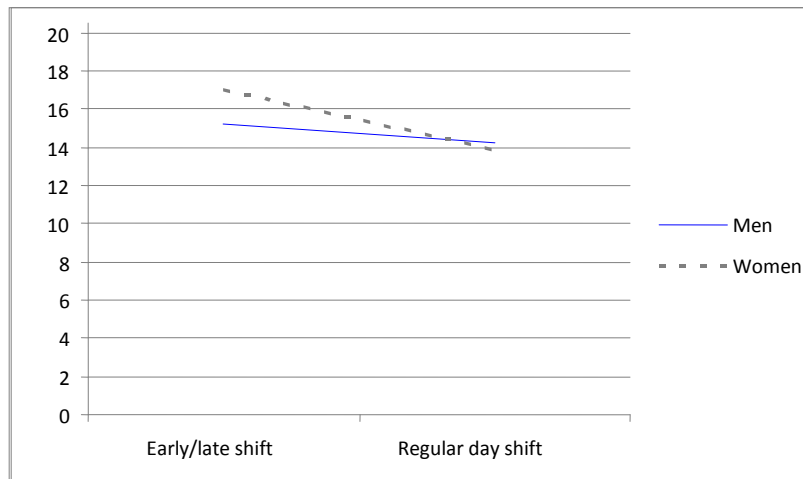


Figure 2. Graphic representation of the means obtained on the stress variable by gender and teaching shift

Discussion and Conclusions

The objective of this study was to analyze how time management, in terms of university professors' teaching shifts, influences psychosocial factors related to perceived health and to stress symptoms, and specifically, whether teaching in the early/late hours yields lower scores on these two factors.

With regard to the first hypothesis of our study, where poorer perceived health and increased stress symptoms were expected to be found among the group of teachers with early/late hours (early morning hours and evening hours), this was found to be the case. Observed potencies of the contrasts can be considered moderate in the first case ($\eta^2=.042$) and high in the second ($\eta^2=.082$). These results are in total agreement with other studies (Cladellas

& Badia, 2010; Olivier & Venter, 2003). From these results, it follows that a university professor's opportunity to arrange his/her work hours, and so balance work and family life, or simply to freely, regularly plan his/her own leisure time, may result in prevention of undesired effects relating to health and especially stress.

It is worth mentioning that the case of university professors is rather exceptional in term of schedule flexibility, since the fixed activities (especially classes) are very few in comparison to many professions where the fixed work hours are much broader and stricter. It is not a reduced work schedule, since research and administrative activities occupy extensive hours (Vera, Salanova & Martín, 2010); however, this profession offers considerable plasticity in managing one's own time.

The effects of these exceptional professional conditions must be interpreted with caution, since it is not clear that the results constitute an estimate of minimums, where the effects ought to be expanded for professions with a lesser opportunity to manage one's own time. In any case, such an extrapolation must be based on a different design, with samples from other professions, and considering aspects such as expectations for control based on acceptance of the work hours.

It is important to see how university professors, with the same number of teaching hours, score differently on measurements of psychosocial risks related to health and stress, depending on their control over conflicts between personal and work time (for example, when work hours hinder dedication to family activities, although, generally speaking, any highly valued activity might be included). As we noted, the university profession allows for considerable personal time management, such that the weight of this variable, when taken in isolation, cannot justify the differences observed. Although measures of schedule conflicts were not taken, a general idea can be established regarding schedules around 9 AM or after 5 PM, times that are linked to the family in our culture, while professional activities are dominant between these hours. Therefore, when professional activity (including commuting time) extends beyond these time limits, it can be affirmed that the probability of schedule conflicts increases notably.

Regarding our second hypothesis, where differences in perceived health and stress were expected between the male and female populations of university professors, results did

not show significant differences between genders when taking this variable in isolation, but such differences were found in combination with teaching shift. The potency of this interaction is moderate both in how it affects perceived health ($\eta^2=.031$) and how it affects stress ($\eta^2=.025$). By contrast, the study by Olivier and Venter (2003) did find significant differences in the sense of women's poorer perceived health, as well as greater stress symptoms. These results are not necessarily contradictory, since different study designs are involved. Moreover, our study finds significant differences between genders in interaction with teaching shift. The interaction of teaching shift with gender includes a crosscutting variable: the incidence of the social-family role in triggering schedule conflicts (as confirmed in the line of research launched by Greenhaus and Beutell en 1985 and strongly ratified by other researchers, as mentioned in the introduction). This variable displaces the explanatory focus of the work shift *per se* (or gender *per se*), shifting it to their conflict or overlap with time devoted to activities that are considered equally or more important to the individual. Consequently, opportunity to manage one's own time takes on importance to the extent that it makes it possible to avoid this type of conflict, and not so much in one's opportunity to organize one's time during hours where these conflicts do not occur.

As in the results from Extremera, Fernández-Berrocal and Duran (2003) and from Friedman (2003), gender differences are not observed with regard to age or teaching experience (furthermore, since the minimum teaching experience was five years, there is little likelihood of stress symptoms or poor perceived health stemming from the insecurities typical of the early teaching experiences), such that distribution by gender across the different teaching shifts was perfectly equitable. Therefore, any effect of these variables on results can be discarded.

Differences in the values systems of men and women can account for the interaction between teaching shift and gender: the differences appear in the early/late teaching shift, where there is greater overlap (conflict) with family schedules (for example, arrival and exit times from school), where these moments occupy a higher ranking in women's value scales. Where greater importance is assigned to non-work activities that overlap with professional hours, greater is the intensity of the conflict.

Elements we have noted so far indicate that it is possible to eliminate certain pressures that negatively impact health and stress by adjusting the teaching schedules of university

teachers, avoiding those hours that produce conflicts with outside activities that are considered valuable. Undoubtedly there are many personal components that determine the perceived intensity of the conflict, such as morning or evening, the make-up of class groups, the course being taught, etc.; although these are not considered in this study, results show the existence of conflict with certain teaching hours (those considered early and late). The conflict with family life is a plausible explanation, although not measured directly, and seems to be indicated because of the interaction observed between teaching shift and gender.

This does not necessarily imply elimination of teaching activities during certain hours, but rather a scheduling process that takes individual conflicts into consideration. Let us keep in mind that the conflict emerges when the activity involved is considered to be important (or very important) to the teacher. Thus, it is not a matter of “good” or “bad” hours for everyone, but of timing that permits balancing professional activities with other priorities – priorities that exist on an individual basis. For example, teachers with small children probably find conflict in a teaching schedule that falls between 5 and 9 PM, since this is the time of day that they can spend with their children, after school and before bedtime. However, this conflict need not occur with teachers who have no children or whose children are older. In summary, the question is to avoid increasing the so-called psychosocial risks, and to enhance an appropriate quality of work life (González, Peiró & Bravo, 1996), something that depends on individual conditions and values.

If job conditions have evolved over the years, and with them the way that workers' physical and mental disorders are identified, assessed and diagnosed, the universities and their considerable mass of employees cannot remain outside this process. Leaves of absence due to stress or illness, from a psychosocial perspective, constitute a phenomenon that reflects a latent reality, that is, dysfunctions in the heart of educational organizations. Along these lines, intelligent organizations (De Diego & De Diego, 1998) ought to learn from their mistakes, and implement prevention programs. The most effective of these would be the so-called primary programs (Boada, 1999) aimed at eliminating the causes that lead to employee absenteeism or poor quality in work (Boada, De Diego & Vigil, 2004). Thus, one effective means to reduce labor-related risk and the impact of the traditional cultural of fixed, universal schedules, is to implement more *flexible, rational* schedules, so as to make work and family life compatible. A broad cultural training is needed for this purpose, putting special emphasis on those aspects related to management of work time (Cladellas, 2008). It is important to take

into account the personal situation of each teacher when planning his or her class hours, in order to avoid, as much as possible, personal conflicts or schedules that require long hours at the place of work (something which highly increases the likelihood of conflicts). The inter-individual variability in non-work priorities offers a considerable margin of flexibility, and in cases where this is insufficient, schedule rotations can at least decrease the duration of the stressful situation.

Results from this study can be taken into consideration in scheduling university teaching, inasmuch as a decrease in this type of conflict will probably help improve university teachers' performance, while decreasing costs related to sick leave, whether sickness is real or perceived. The recent introduction of the European Higher Education Area (EHEA) in our universities, with its modified distribution of teaching load and with the possibility of including e-learning interactions, can help contribute solutions to the problems posed in this study. A considerable part of university activity, especially that related to teaching, is not determined by the space where it takes place (such as a laboratory), and therefore allows for significant flexibility in scheduling.

Limitations and future lines of investigation

One evident limitation of the approach taken in this study is that only one profession has been examined, and the practice of this profession has many peculiarities. Thus, it is not viable to make any direct generalization of results. In fact, it is probable that the expectations and strategies that exist in professions with fixed schedules are quite different from those that emerge when dealing with a flexible schedule that can vary from year to year. Therefore, one complementary line of research would be to contrast these results with those of other professions with different schedule configurations, at the same time including an explicit evaluation of the expectations that emerge in each case.

On the other hand, researchers are unable to assign participants at will when forming groups for this type of study; obviously they cannot modify the organizational aspects of the institutions involved, and are forced to use a quasi experimental design. Thus, it is possible that other factors outside the control of the experiment have intervened in the internal organization of the different institutions (anything from schedule preferences due to people's morn-

ing or night tendencies, to aspects involving internal relations between teachers, and organizational procedures for each teaching group); such factors are difficult to apprehend.

One general aspect that can be observed from the results is the noticeably greater increase in stress symptoms associated with early/late teaching schedules in comparison to how these schedules affect perceived health. Since this was not directly addressed in the hypotheses, experimental controls were not applied to this aspect; thus, it can only be considered as a heuristic indication to be confirmed in later studies. This evidence suggests that stress symptoms are a more direct reflection of the schedule conflict situation (with scores for the early/late shifts being 22.8 % greater in women and 6.7 % greater in men), while perceived health, in any case, would be affected in the longer term (with the early/late shifts its scoring increases only by 12.4 % in women and 0.9 % in men). This does not disguise the interaction between early/late shift and gender, as is reflected in both increases, noticeably greater in the women's group.

Finally, an explicit evaluation of perceived conflict (for example, based on participant interviews) could shed light on the makeup of individual causes.

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