

# ARTICLES

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## SOCIAL AND FAMILY LIFE IMPACT OF SHIFT WORK FROM THE PERSPECTIVE OF FAMILY MEMBERS

*Impactos na vida social e familiar do trabalho por turnos na perspectiva dos familiares*

*Impacto en la vida social y familiar del trabajo por turnos desde la perspectiva de los familiares*

### ABSTRACT

Research has thus far privileged the impact of shift work on workers' health from the workers' perspective. Inversely, this study evaluates the impacts of such a work schedule on the family and social life of workers according to their partners' perspective. It also compares the impacts of two different work schedules (shift work vs. standard work) on family and social life. Five hundred and fifteen partners of Portuguese police officers participated in the study, and it was found that shift work has a moderate to high impact on all evaluated areas of family and social life. Partners of shift workers report greater impacts on family reorganization and joint social life. Regarding the two work schedules, statistically significant differences were found in all evaluated areas, and the partners of shift workers reported greater impacts of their partner's work schedule than did the partners of day workers.

**KEYWORDS** | Work schedules, shift work, family and social life, family members' perspective, police officers.

### RESUMO

*A investigação tem privilegiado o estudo dos impactos do trabalho por turnos na saúde dos trabalhadores considerando a perspectiva dos próprios. Em contraste, o presente estudo avaliou os impactos dessa modalidade horária na vida familiar e social dos trabalhadores, segundo a perspectiva dos cônjuges/companheiros(as). Compararam-se também os impactos de dois horários de trabalho diferentes (trabalho por turnos vs. horário normal) na vida familiar e social. Participaram no estudo 515 cônjuges de policiais portugueses. Verificou-se que o trabalho por turnos tem impacto de moderado a elevado em todas as áreas avaliadas da vida familiar e social, tendo os cônjuges de trabalhadores por turnos relatado maiores impactos na reorganização familiar e na vida social conjunta. Quanto aos dois horários, foram encontradas diferenças estatisticamente significativas em todas as áreas avaliadas, tendo os familiares de trabalhadores por turnos relatado maiores impactos do horário de trabalho do cônjuge do que os familiares de trabalhadores diurnos.*

**PALAVRAS-CHAVE** | Horários de trabalho, trabalho por turnos, vida familiar e social, perspectiva dos familiares, policiais.

### RESUMEN

*Las investigaciones anteriores han privilegiado el estudio del impacto del trabajo por turnos en la salud de los trabajadores desde su propia perspectiva. Este estudio, por el contrario, evaluó el impacto de la modalidad horaria según la perspectiva de los cónyuges/compañeros/as. Se comparó también el impacto de dos tipos de horarios (trabajo por turnos contra horario normal) en la vida familiar y social. En el estudio participaron 515 cónyuges de policías portugueses. Se constató que el trabajo por turnos tiene un impacto de moderado a elevado en todas las áreas evaluadas de la vida familiar y social, y los cónyuges de trabajadores por turnos relataron mayor impacto en la reorganización familiar y en la vida social conjunta. En cuanto a los dos horarios, se encontraron diferencias estadísticamente significativas en todas las áreas evaluadas, y los familiares de trabajadores por turnos relataron mayor impacto del horario de trabajo del cónyuge que los familiares de trabajadores diurnos.*

**PALABRAS CLAVE** | Horarios de trabajo, trabajo por turnos, vida familiar y social, perspectiva de los familiares, policías.

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## INTRODUCTION

Working hours have a structuring role in the temporal organization of individuals, organizations and societies. Therefore, they are considered to be one of the primary dimensions of working conditions. The quantity and quality of time available out of work are fundamental and must be considered for the adequate management of working time, given that society and families tend to be ruled by a temporal pattern (i.e., working during the day and resting in the evening/night), which may, in some cases, coincide with working hours (e.g., night work). In this context, the organization of working time creates important challenges to organizations from the point of view of human resource management, in general, and work-life balance, in particular.

As societies evolve, the realm of work has constantly been in flux. From the beginning of the 21st century, a new economy began to gain importance – the “24/7 economy”, which translates into an increase in the operational time of organizations until the 24 hours per day, 365 days per year (Costa, 2003). This new economy results from the interrelation of multiple factors, such as market competition, consumer demand for 24-hour services, and women's involvement in the labor market. To respond to such demands, work schedules have undergone several changes, including the development of nonstandard work schedules. This designation has been applied to characterize schedules that differ from contemporary standard working hours (typically defined as Monday to Friday, 9:00 a.m. to 5:00 p.m.), exemplified by shift work and night work.

According to Law no. 7/2009 of February 12th, which regulates the Portuguese Labor Code, “shift work shall be deemed to be any organization of teamwork in which workers occupy successively the same jobs, at a certain rhythm, including rotating, continuous or discontinuous, and can perform the work at different times over a given period of days or weeks” (Article 220). According to the same legislation, night work is that which is “provided in a period that has the minimum duration of seven hours and a maximum of 11 hours, including the interval between 12:00 a.m. and 05:00 a.m.” (Article 223, point 1). Point 2 of the same Article makes it clear that the “night work period can be determined by collective labor regulation instrument” and that in the absence of this, the “period between 10:00 p.m. of one day and 07:00 a.m. of the next day” is to be considered. The *Sixth European Working Conditions Survey* show that, in 2015, 21% of European Union workers worked shift work and 19% were night workers (European Foundation for the Improvement of Living and Working Conditions – Eurofound, 2016). As elaborated below, such hourly configurations, when compared with standard

working hours, have been associated with increased difficulties in the organization of family/social life.

In recent decades, the family dynamic has undergone several changes (e.g., average increase in the age of parenting, increase of double-career couples or single-parent families), with some representing greater difficulties in the performance of family roles and the complexity of the relationships between the various members of the household (Oláh, Kotowska, & Ritcher, 2018). For example, in the early 1990s, there were about 200,000 single-parent families in Portugal, whereas in 2017, there were close to 440,000 (PORDATA, 2018). On the other hand, the aging population has led to the emergence of a new type of family that includes caring for the elderly. Parker and Patten (2013) call these new families a “sandwich generation”, because apart from taking care of their own children, parents also take care of their elderly parents (in 2012, 15% of North Americans middle-aged adults were in this situation). Oláh et al. (2018) argue that family life is a social construction, since daily life is incorporated with “internal daily routines, practices and external social activities, interlinked with changes in gender roles and family relationships” (p. 17) and, in this sense, it must be understood in a broader societal setting.

## Consequences of shift work

Although research on the negative consequences of shift work is prevalent (Shen & Dicker, 2008), this type of schedule can represent benefits for workers where the economic benefits (e.g., extra compensation) and the temporal reorganization (e.g., more free time during the day facilitating access to daytime services) are emphasized (Silva, 2012; West, Mappedzahama, Ahern, & Rudge, 2012).

According to Costa (2004), the relation between shift work, health, and well-being can be conditioned by several factors, such as personal characteristics, work requirements, social status, and family relationships. Despite this complexity, the difficulties caused by shift work can be organized into three areas: organizational (e.g., safety reduction), health (e.g., sleep problems), and the family/social life of workers (e.g., difficulties in social relationships) (Silva, 2012). In recent years, research on the impacts of shift work has been increasing and diversifying, but there is still a predominance of studies that emphasize impacts on workers' health, rather than their family and social lives (Matheson, O'Brien, & Reid, 2014).

On the other hand, the evidence (e.g., Handy, 2010; Li et al., 2014) has indicated that the most detrimental shift systems for workers are those that include night work, weekends, and

rotation for different shifts, given that free time at the end of the day and on the weekends is perceived as high-value in terms of family contact and social activities. Despite the interference in the family and social domains that end-of-day working hours may represent, it can generally be said that Portuguese legislation recognizes, above all, the pain associated with night work (i.e., only after 10:00 p.m.), which must be “paid with an increase of 25% in relation to the payment of equivalent work during the day” (Article 266, Law no. 7/2009 of February 12th).

## Effects on family and social life

In general, the problems associated with shift work in family and social life arise in response to the temporal mis-adjustment of worker’s schedules and society’s general timetables, focusing mainly on conjugal and parental conflicts and difficulties in social interaction (Baker, Ferguson, & Dawson, 2003; Handy, 2010).

Wight, Riley, and Bianchi (2008), using a sample of approximately four thousand workers with minor children, compared the impacts of nonstandard work schedules with the impacts of standard working hours on family-life level, and both positive and negative aspects were observed. On the one hand, parents who worked nonstandard schedules involving nights spent more time with their children than parents working in standard work schedules. On the other hand, parents working in nonstandard work schedules involving evenings, in an attempt to maximize parental contact, harmed their marital relationships and personal leisure time. Other authors (Mauno, Ruokolainen, & Kinnunen, 2015; Tuttle & Garr, 2012) also observed that shift workers, compared to day workers, present greater work-family conflict.

Concerning conflicts in marital relations, Smith and Folkard (1993) performed an exploratory study evaluating the perceptions of 47 spouses of shift workers on the impact their spouses’ work schedules had on their lives. “Marital conflicts”, “adjustment of life at the husband’s schedule” and “social life” were related as the most affected areas. In contrast, the least affected areas were “special occasions” and “parental contact” with children. In this study, most of the spouses were unhappy with their husband’s shift work schedule, and one third had tried to persuade their husbands to alter their work schedules. Also, Minnotte, Minnotte, and Bonstrom (2015) observed that both work-family conflict and family-work conflict were negatively associated with marital satisfaction.

In addition to marital relations, parental relations are also impacted by shift work. In the study by Volger, Ernst,

Nachreiner, and Hänecke (1988), the common free time was calculated between shift workers and their children (i.e., free time that dyads had in common) at preschool and school ages. The results indicated that, on the one hand, preschool children had more free time in common with their parents, but on the other, school children had very little free time in common. Later, Rosenbaum and Morett (2009) also observed that shift work was negatively associated with worker health, marital quality, parental interactions, and family routines. Over the years, other authors (e.g., Gracia & Kalmijn, 2016; Maume & Sebastian, 2012) have found negative associations between different shift work systems and marital and/or parental relationships.

Shift work can also cause negative social impacts, mostly because the most valued periods in this area (end of the day and weekend) are overlapping by the working periods of these workers (Baker et al., 2003; Craig & Brown, 2014). Baker et al. (2003) evaluated shift workers’ and daytime workers’ valuation of time. To examine this, they used temporal matrices in which 220 workers (110 representatives of each work schedule) had to evaluate each weekly hour according to four times/spheres of life: work, social, leisure, and family. Regarding working time, although shift workers preferred conventional schedules, they demonstrated greater flexibility in this area in comparison to daytime workers. As for the social, leisure and family spheres, the two groups valued time similarly, which represented greater difficulties in the case of shift workers in terms of reconciling working hours with other spheres of their lives.

In general, research focused on work-family conflict in Portugal (e.g., Carvalho, Chambel, Neto, & Lopes, 2018) does not include shift work as an object of study. The investigation into the impacts of shift work has privileged health impacts (e.g., Oliveira & Pereira, 2012) without paying adequate attention to workers’ family and social lives (e.g. Ferreira & Silva, 2013).

Despite the increasing interest in the impact of shift work on family and social life, it has been suggested (e.g., Maume & Sebastian, 2012) that there is a need to collect the complimentary perspectives of third parties as family and friends to contextualize the perspectives of workers to gain a better understanding of the subject, which is, in fact, still notably rare in contemporary research. There are no study indicators that integrate third-party perspectives to examine the impacts of shift work in Portugal.

## OBJECTIVES

Based on the literature review and scarcity of studies that analyze family perspectives on the impact of shift work in the family and

social spheres, this study's main objectives were: i) to contribute to the validation of the scale developed by [Smith and Folkard \(1993\)](#), the *Shiftworker partner questionnaire*; ii) to characterize the interference of shift work in workers' family and social lives based on the reports of the Portuguese police spouses/partners; iii) to analyze the relationship between the impact of shift work and personal and family variables; and iv) to compare the reports of shift workers' spouses/partners with the reports of day workers' spouses/partners.

In this study, the focus on shift work concerns rotating shift systems that include nights and weekends due to the impacts that several authors (e.g., [Handy, 2010](#); [Li et al., 2014](#)) have found in the family and social spheres.

## METHODOLOGY

### Participants

The sample consists of 515 spouses/partners of Portuguese Public Security Police (PSP) agents — 403 spouses/partners of shift workers and 112 spouses/partners of day workers. As mentioned, the main objective of the study was to understand the interference of shift work in family and social life from the perspective of the spouses/partners of shift workers; thus, they comprise the majority of study participants. However, in order to increase confidence in the analysis of such interference, it was decided to integrate a second group of participants (spouses/partners of day workers) to allow the researchers to compare the perspectives of shift workers' spouses/partners and day workers' spouses/partners in the evaluated effects. Data were collected in all districts of mainland Portugal and in the Autonomous Regions of Madeira and the Açores. Lisboa (27.7%) and Porto (14.7%) were the most representative districts, while Beja (0.6%) and Bragança (0.6%) were the least, in its turn each Autonomous Region contributing about 4% of the total sample. All police in the different geographical regions were subject to the same working conditions.

As can be seen in Table 1, the sample consisted of 61.7% female participants, mostly married (77.1%) and aged 23-68 years ( $M=40.61$ ,  $SD=8.11$ ). As for the level of education, most of the spouses/partners of police had attained secondary education or above (80.6%). One should note that 64.5% of the participants had previously worked shifts and 43.6% of the participants currently worked shifts.

The police officers are between the ages of 23 and 58, with the average age being 41.06 years ( $SD=7.57$ ). In professional terms, they have an average seniority in the profession of 17.79

years ( $SD=7.96$ ) and an average antiquity in the current work schedule of 12.80 years ( $SD=8.48$ ). Regarding the scales of the police officers who are subject to shift work, two different modalities have been reported, although both imply alternation between the morning, afternoon and night periods. In the first modality, they work two days in a row in a given shift, and after eight days of work, they are meant to have two days off. In the other, they work two days in a row in a given shift, and after six days of work, they are meant to have four days off.

The participants are married or have been living together for at least one year, and the maximum number of years of marriage is 38 years ( $M=13.40$ ,  $SD=8.50$ ). Most households consist of four people (42.52%).

### Instruments

For data collection, two evaluation protocols were used—one for each group of participants. The evaluation protocols were equal in the sociodemographic and professional questionnaire but differed in the working-hours impact questionnaire. All instruments were developed based on the instruments used by [Smith and Folkard \(1993\)](#).

The purpose of the sociodemographic and professional questionnaire was to collect sociodemographic information about the participants (e.g., age), their professional situation (e.g., working hours), and their family situation (e.g., number of years of union), as well as data related to the spouse/partner (e.g., seniority in the profession).

The working-hour impact questionnaire was developed based on the *Shiftworker partners questionnaire* by [Smith and Folkard \(1993\)](#). The original questionnaire evaluated the impact of shift work on the family and social lives of workers according to the perspective of their spouses (in this study, all participants were female). This instrument was chosen because it is the only one found in the literature evaluating the impact of shift work. The instrument consisted of 18 items evaluated on a Likert scale of 0-10 points, with the highest values representing greater disruption. From the exploratory factor analysis performed by [Smith and Folkard \(1993\)](#), a factor called "Total Disruption" emerged, composed of 16 of the 18 items evaluated with a Cronbach's alpha value of 0.81. As this questionnaire was not adapted for the Portuguese population, it was necessary to contact the authors to request their authorization for its use.

Once the questionnaire was obtained, it was translated and adapted to the Portuguese context, which was designated as the *Questionnaire on the impact of shift work from the perspective of*

*family members*. This consisted of 15 items from the original scale and some complementary items/questions developed *a posteriori* by the original authors, which are available upon request of the scale. These additional items were added to the questionnaire, thus allowing a more in-depth reading of certain aspects. Specifically, they included three questions evaluated on a Likert scale of 0-10 points, four dichotomous questions (“Yes” and “No”), and two open response questions, one regarding participants’ perception of the impact that their spouses’/partners’ work had on the children and another providing space for suggestions/comments concerning the topic addressed. These two issues have already been the subject of previous publication (Costa, Silva, & Veloso, 2017) and will therefore not be addressed here.

**Table 1. Sociodemographic and professional characterization of spouses/partners of shift workers and day workers**

Variable		Group 1		Group 2		Total*	
		n	%	N	%	n	%
Gender	Female	271	67.2	47	42.0	318	61.7
	Male	132	32.8	65	58.0	197	38.3
Marital status	Single	25	6.2	5	4.5	30	5.8
	Married	305	75.7	92	82.1	397	77.1
	Union	66	16.4	12	10.7	78	15.1
	Divorced	7	1.7	3	2.7	10	1.9
Professional situation	Full-time work	336	83.4	105	93.8	441	85.6
	Part-time work	23	5.7	1	0.9	24	4.7
	Housework	12	3.0	4	3.6	16	3.1
	Unemployed	31	7.7	2	1.8	33	6.4
	Retired	1	0.2	0	0.0	1	0.2
Work schedule	Day shift	181	51.0	63	60.6	244	53.2
	Morning shift	6	1.7	0	0.0	6	1.3
	Evening shift	0	0.0	1	1.0	1	0.2
	Night shift	2	0.6	0	0.0	2	0.4
	Rotating shift	162	45.6	38	36.5	200	43.6
	Other	4	1.1	2	1.9	6	1.3
Have you ever worked in shifts?	Yes	246	61.0	86	76.8	332	64.5
	No	157	39.0	26	23.2	183	35.5
Children's age	Under 6 years	136	43.2	32	32.3	168	40.6
	From 6 to 12 years	89	28.3	31	31.3	120	29.0
	From 12 to 18 years	51	16.2	18	18.2	69	16.7
	Over 18 years	39	12.4	18	18.2	57	13.8

Group 1 – Spouses/partners of shift workers

Group 2 – Spouses/partners of day workers

\*The obtained N can be different from the sample size (N=515) due to missing values in some variables.

In turn, another questionnaire entitled *Questionnaire on the impact of working hours from the perspective of family members* was developed for the spouses/partners of day workers. This questionnaire was developed using the one previously described, and only the possible items of comparison between the two groups of participants (nine scale items and five complementary questions) were used.

## Procedure

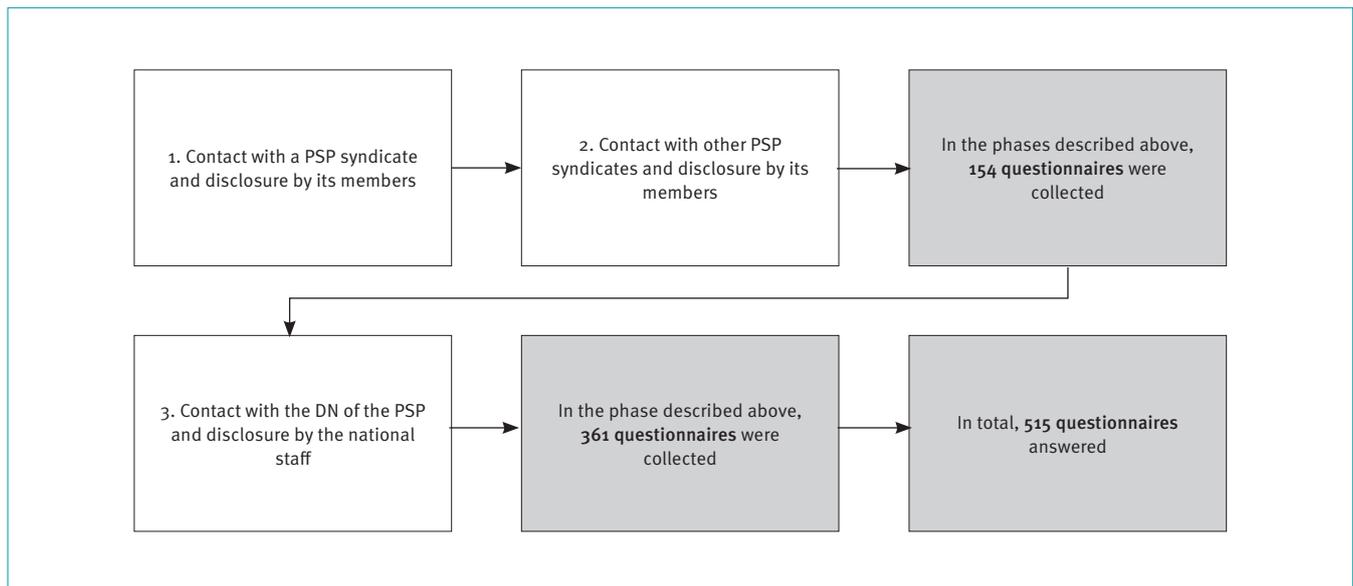
At an early stage and after two versions of the assessment protocol had been created (one for each family group in analysis), contact was established with a Union of the PSP, which agreed to disseminate the questionnaire online through their associates. Despite some responses having been collected at this stage, the response number fell short of the objective initially set, which was 200 participants. This number was established based on the recommendations for the validation of instruments (e.g., Almeida & Freire, 2003).

In the second phase, new contacts were made with other unions to try to maximize the number of answers. The links to the questionnaires were sent by email, along with an explanation of the purpose of the study, to each union

president. Three of the contacted unions agreed to publish the study through their associates, allowing an increase in the number of initial questionnaires. The questionnaires addressed to trade unions were available for about six months (January–June 2016).

In the first two phases of dissemination of the study, 154 responses were collected, which still fell short of the minimum desired sample size. In the third phase, the National Direction (ND) of the PSP was contacted for the same purpose as the previous contacts—to disseminate the study and increase the number of responses. After approval and consequent nationwide dissemination, the questionnaires were available for about three months (June–September 2016). At this stage, 361 responses were collected. A flowchart of the data collection phases is shown in Figure 1.

Figure 1. Stages of data collection



It should be noted that the contacts made with the presidents of unions and, later, with the ND, emphasized the objective of the study and to whom it was directed. The idea that it should be *the spouses/partners of the police* who respond and not the security agents themselves was reinforced several times. This idea was also emphasized in the questionnaires, along with the guarantee of anonymity and confidentiality.

The *Statistical Package for the Social Sciences* (IBM® SPSS®) was used to analyze the data, which allowed: i) exploratory factor analysis of the scale; ii) descriptive analyses and iii) inferential analyses for associations between variables and the comparison of groups, while nonparametric tests were performed due to non-compliance with the assumptions for

the use of parametric tests (Field, 2005). In addition to SPSS, *Analysis of Moment Structures* (IBM® SPSS® Amos) was also used to perform confirmatory factor analyses.

## RESULTS

This section presents the results of the psychometric properties analysis of the scale used, the characterization of shift work interference in family and social life according to spouses/partners of shift workers, and the comparison between the perspectives of spouses/partners of shift workers and spouses/partners of day workers.

## Analysis of the psychometric characteristics of the scale

### Exploratory factor analysis (EFA)

The data analysis began with the EFA of the main components with varimax rotation of the scale used. The KMO (*Kaiser–Meyer–Olkin measure of sampling adequacy*) value obtained was 0.94, which is above the limit value (0.5) for acceptance of the sample (Field, 2005). Bartlett's test of sphericity was conducted, yielding  $\chi^2(105)=3679.88$ ,  $p<.001$ , which allowed the continuity of the analysis.

In the set of 15 items, two factors were extracted that explain 65.58% of the total variance. As shown in Table 2, the first factor explains 39.37% of the total variance and consists of nine items, while the second factor consists of six items and explains 26.21% of the total variance. For the purpose of retaining the item

in its factor, a factor loading  $\geq 0.5$  (Tabachnick & Fidell, 1989) was considered, having two items presenting factor loadings slightly below this value (Item 1 – 0.450 and Item 17 – 0.495). However, since it was the first time that this scale had been applied in the Portuguese context and because the values were very close to the desired ones, it was decided to keep them in the following analyses.

The first factor encompasses items related to social life, the organization of domestic life and the child-rearing responsibilities of the participant (i.e., items that address the planning and reorganization of the family and social spheres resulting from the shift work of at least one member of the household). In its turn, the second factor consists of items that are focused on the relationship between household members (i.e., items that assess the impact of shift work on marital relationships (participant-police) and on parental relationships (police-children)).

**Table 2. Results of exploratory factor analysis of the scale used in the study**

Item*	Factor 1	Factor 2
1. How do you feel about your partner working shifts?	0.164	<b>0.450</b>
3. Have you ever had any opposition or conflict with your partner which you feel was due to your partner working shifts?	0.139	<b>0.820</b>
4. Generally speaking, do you feel that your relationship with your partner has been disrupted or harmed due to your partner working shifts?	0.368	<b>0.804</b>
5. Do you feel that your intimate personal relationship has suffered at any time as a result of your partner working shifts?	0.359	<b>0.768</b>
6. Does your partner's shift working interfere with your joint social life? (i.e., does it stop you from going out together as much as you would like?)	<b>0.725</b>	0.497
7. Do you find that you and your partner have to constantly rearrange your lives to accommodate your partner's shift work?	<b>0.672</b>	0.504
8. By keeping the noise level down during the day after a night shift (e.g., not doing housework, having to be very quiet, not having guests or keeping children quiet).	<b>0.767</b>	0.364
9. By preparing meals at unusual times or changing their mealtimes to accommodate your partner.	<b>0.758</b>	0.360
10. By taking much greater responsibility for childcare	<b>0.721</b>	0.358
11. By having to be alone for much of the time during the day.	<b>0.877</b>	0.214
12. By having to be alone for much of the time during the evening.	<b>0.885</b>	0.210
13. By having to be alone during the night.	<b>0.801</b>	0.264
14. To what extent does your partner's shift work interfere with your personal social life or free time? (e.g., hanging out with friends, going to cinema, going to the hairdresser or taking a walk)?	<b>0.721</b>	0.469
15. Is your partner able to change shifts with a colleague, or get time off easily, for special occasions such as birthdays or weddings, or does everything have to adapt to your partner's shift pattern?	0.289	<b>0.550</b>
17. If you have children living at home, do you feel that your partner has enough day-to-day contact with them in general?	0.373	<b>0.495</b>
<b>% of variance explained by factor</b>	<b>39.37</b>	<b>26.21</b>

\*The number of items is not sequential, due to the existence in the questionnaire of supplementary questions between the scale items

### Confirmatory factor analysis (CFA)

Considering the results obtained in the previous EFA that point to a two-dimensional structure and the one-dimensional structure referred to by the authors of the original scale (Smith & Folkard, 1993), the CFA was used to test two models: *Model 1*, which included only one factor, and *Model 2*, which included two factors. To evaluate the quality of each model's adjustment to the data, the following indicators were used:  $\chi^2/\text{gl}$ , GFI, NFI, CFI e RMSEA (Kline, 2005).

As can be seen in Table 3, the adjustment values of *Model 1* and *Model 2* are not acceptable. Analyzing the factor loadings of the items, it was verified that, in both models, Item 1 presents a

factor loading  $< 0.5$  (0.37 and 0.40, respectively). The remaining loadings vary between 0.52 (Item 16) and 0.87 (Item 6) in *Model 1* and between 0.52 (Item 16) and 0.90 (Item 4) in *Model 2*. On the other hand, the inspection of the modification indices indicated a high covariance between the errors of Item 11 and Item 12, in both models (*Model 1* – 247.77 and *Model 2* – 245.39). Considering these results, two new models were tested: *Model 3*, similar to *Model 1*, and *Model 4*, similar to *Model 2*, but without Item 1 (for the reasons presented above) and Item 12. Item 11 was retained due to the greater comprehensiveness of the content it addresses. Considering the adjustment indices shown in Table 3, *Model 4* exhibits acceptable adjustment values and was utilized in the following analyses.

**Table 3.** Adjustment indices for the different models tested in the confirmatory factor analysis

Models	$\chi^2/\text{gl}$	GFI	NFI	CFI	RMSEA
<i>Model 1</i>	8.995	0.739	0.788	0.806	0.161
<i>Model 2</i>	6.782	0.798	0.842	0.861	0.137
<i>Model 3</i>	6.020	0.821	0.871	0.890	0.127
<i>Model 4</i>	3.326	0.901	0.930	0.950	0.087

Based on the analysis of the content present in the two factors resulting from previous analyses, the first factor (or first subscale) was titled “Global Disruption” ( $M=7.41$ ,  $SD=2.40$ ) and the second factor (or second subscale) was titled “Disruption in Family Relationships” ( $M=5.81$ ,  $SD=2.33$ ). The reliability analysis indicated that each factor has high internal consistency (“Global Disruption” –  $\alpha=0.95$  and “Disruption in Family Relationships” –  $\alpha=0.84$ ) and both correlate positively ( $r_s=0.726$ ,  $p<0.001$ ).

### Characterization of shift work interference in family and social life

In order to develop a more detailed characterization of the interference of shift work in family and social life, the mean and standard deviation for the 13 items retained were calculated (see Table 4). For a better comparative perception among the evaluated areas, these were sorted in descending order.

As shown in Table 4, all items scored above or close to five points (Item 3 – 4.98). Considering that the items were evaluated on a Likert scale of 0-10 points in which higher score correlated with a greater impact caused by shift work in family and social

life, it can be said that shift work had a moderate to high impact in all the areas evaluated, according to the perspective of the spouses/partners of Portuguese police that work in shifts. The “reorganization and planning of family and domestic life” and the “social life of the members of the household” are the areas most affected by shift work (Items 6, 7, and 8), while the “existence of marital conflicts and/or disagreements arising from shift work” (Item 3) is the least affected area.

As a result of this characterization, seven supplementary questions—which were part of the shift work impact questionnaire—were also analyzed. These issues were divided into two themes: the impact of shift work on personal aspects relating on marital relationships and the impact of shift work on parental relationships (see Table 5).

When reviewing the information in Table 5, it should be noted that most participants have already attempted to persuade the shift workers to change their working schedules (54.6%). Regarding parental relationships, most respondents report that contact between shift workers and children is insufficient (62.4%) and that other working schedules would be better for the relationship (88.7%). As for the shifts integrated in the rotating system, the night shift is perceived as the most detrimental to parental relationships.

**Table 4.** Descriptive statistics of the items that make up the scale (in descending order of interference) in the perspective of the spouses/partners of shift workers

Variable	Mean	Standard deviation
7. Constant reorganization of family life	7.89	2.59
8. Noise level	7.68	2.68
6. Joint social life	7.58	2.74
13. Being alone during the night	7.52	2.91
9. Meals schedule	7.32	2.87
10. Responsibility for children	7.19	2.87
14. Personal social life	7.18	2.78
11. Being alone during the day	6.97	2.91
5. Intimate relationships	6.36	3.09
4. Marital relationships	6.14	2.98
15. Flexible hours	5.81	2.87
17. Parental contact	5.54	2.76
3. Marital conflicts	4.98	3.18

**Table 5.** Frequency of answers to questions related to impact on personal aspects and parental relationships

Variable		Total*	
		n	%
Have you ever tried to persuade him to change working hours?	Yes	220	54.6
	No	183	45.4
Are you usually aware of your spouse/partners' shift work schedules?	Yes	365	90.6
	No	38	9.4
If you think that contact with children is insufficient, do you think that is harmful to them?	Yes	181	62.4
	No	109	37.6
Parental contact for different working hours:** M (SD)***	Morning shift	5.25 (2.57)	
	Evening shift	5.80 (2.70)	
	Night shift	6.44 (2.88)	
Do you think that another working schedule would improve his contact with the children?	Yes	275	88.7
	No	35	11.3

\*The obtained N can be different from the sample size (N=403) due to missing values in some variables;

\*\*The higher the value, the greater the perceived interference in parental contact;

\*\*\*M (Mean), SD (Standard Deviation)

## Analysis of the relationship between the impact of shift work and personal and family variables

At the level of the two subscales evaluated (Global Disruption and Disruption in Family Relationships), no statistically significant differences were found between the participants who are *aware of the shift work schedules of the spouses/partners* and those who

do not have this knowledge, nor between participants *who work or have already worked* in shifts and those who have never worked in shifts. No correlation was found between the *number of union years* and the two subscales evaluated.

Statistically significant differences were found among participants who have *tried to persuade their spouses to change working hours* and those who have not at the level of Global Disruption ( $U=9192.00$ ,  $p<0.001$ ) and at the level of Disruption in Family Relationships ( $U=7444.50$ ,  $p<0.001$ ). Specifically, participants who have already tried to persuade partners to change their working schedules ( $Mean Rank=179.87$ ) reported greater impacts from the shift work at the Global Disruption level than those who have not ( $Mean Rank=136.46$ ). Similarly,

participants who have already made attempts of persuasion ( $Mean Rank=182.71$ ) reported greater impacts of shift work on Disruption in Family Relationships compared to those who have not ( $Mean Rank=123.80$ ).

### Comparison between the reports of spouses/partners of shift workers and spouses/partners of day workers

In order to analyze the differences between the reports of spouses/partners of shift workers and day workers, *Mann-Whitney (U)* tests were performed on the items evaluated in both groups (see Table 6).

**Table 6.** Comparison between the reports of spouses/partners of shift workers and spouses/partners of day workers

	Group 1 (N=403)	Group 2 (N=112)	U
3. Marital conflicts	282.34	170.42	32376.50***
4. Marital relationship	292.33	134.47	36403.50***
5. Intimate relationships	290.06	142.65	35487.00***
6. Joint social life	300.02	106.79	39503.50***
7. Constant reorganization of family life	298.73	111.46	38981.00***
10. Responsibility for children	238.69	113.46	24771.50***
14. Personal social life	298.31	112.95	38813.50***
17. Parental contact	224.89	136.33	21424.00***

Group 1 – spouses/partners of shift workers; Group 2 – spouses/partners of day workers

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

As can be seen in Table 6, all the comparisons showed statistically significant differences, in that the spouses/partners of shift workers perceive greater impacts of the work schedule of the police officers on their family and social life than the spouses/partners of day workers.

## DISCUSSION

The first objective proposed in this study was to contribute to the validation of the scale developed by Smith and Folkard (1993) for the Portuguese context. In general, the methods of analysis of the *Questionnaire on the Impact of Shift Work* indicated good psychometric properties in the sample studied. However,

contrary to the original study, two factors were identified, one more general factor that encompassed themes such as the reorganization of family life and another factor more focused on family relationships, both conjugal and parental. The differences found between the original scale and the adapted scale may be due to multiple factors, such as the different contexts in which the two studies were performed (e.g., calendar year, country/culture, changes in society and, consequently, in families), as well as the different size of the samples (47 spouses of shift workers in the original study versus 403 in the present study). In this discussion, it should also be noted that the instrument used was developed in 1993; therefore, it may not be comprehensive enough to capture the current family and social reality. We suggest that this instrument be further refined in the future. Notwithstanding

the previous considerations, it should also be emphasized that the instrument, when confronted with literature (e.g., Baker et al., 2003; Rosenbaum & Morett, 2009), integrates several facets (e.g., “organization of family life”, “marital relations”, “parental relationships/contacts”) contemplated in the study of shift work’s impact in the family and social domains. Moreover, as mentioned previously, this was the only instrument in the literature that assesses the impact of shift work in such domains based on the perspective of spouses/partners.

Regarding the second objective—to characterize the impact of shift work on the family and social lives of workers, according to the perspective of their spouses/partners—the results demonstrated that shift work has a moderate to high impact in all areas evaluated. The areas most affected are the constant reorganization/planning of personal and family life, as well as social life, whether personal or joint. From a more conceptual perspective, such results reinforce the pertinence of observations made by authors, such as Chambel and Ribeiro (2014) or Oláh et al. (2018)—that the demands of the labor market are increasing and family dynamics are continuously evolving, which requires a constant search for a work-family balance given that reality indicates that most of the population is engaged with both work and family responsibilities. From the empirical perspective, except Smith’s and Folkard’s (1993) finding that “marital conflicts” was the most affected area, the results are consistent with research that points to the high impact that shift work has in familial and social contexts (e.g., Minnotte et al., 2015; Rosenbaum & Morett, 2009). Complementary issues of present study reinforce this impact, since they all revealed a high interference between shift work in family life, marital, and parental relationships. In any case, it should be highlighted that in this study, parental contact in connection with the night shift was the most affected, contrary to the study by Wight et al. (2008), in which participants working “atypical” schedules reported greater conflicts in parental relationships when working the evening shift.

The statistically significant differences observed in the comparison between the existence of persuasive attempts by the participants—in which those who had already attempted persuasion reported greater impacts on the two subscales—further reinforce the difficulties that the rotating shift system may represent in the management of family/social life and, consequently, in the discontent of spouses/partners. Given the high percentage (54.6%) of such persuasive attempts by the spouses/partners of shift workers in this sample, it would be important to deepen their influence. Other authors (Newey & Hood, 2004; Smith & Folkard, 1993), while not comparing between the existence or non-existence of persuasion attempts, found

a notable amount of persuasion attempts in samples that also reported shift-work’s high impact on family and social life.

Finally, with regard to the comparisons between the reports of relatives of shift workers with the reports of relatives of day workers, the results of the present study support those of previous studies (e.g., Mauno et al., 2015; Tuttle & Garr, 2012). That is, shift work has greater impacts on family and social life than conventional work schedules. However, although the results obtained are in the expected direction, the comparison between this study and previous ones cannot be direct. This disparity is due to the innovative character of this study in examining the perceptions of the spouses/partners, rather than the perceptions of the workers themselves. In any case, we believe that it is important to emphasize the convergence of perceptions regarding the existence of a greater impact of rotating shift work on family and social life in comparison with a “normal” or “conventional” work schedule. In fact, shift work has increased in recent years, leading to greater work-family conflict for workers who must work these schedules due to their lack of synchronization with the rest of the household. To this end, the literature must explore alternative intervention strategies that help minimize such impacts for workers. In this context, Demerouti, Geurts, and Bakker (2004) suggested that shift work should be avoided or should be planned flexibly. Indeed, if we consider that the circumstances and family/social needs of workers may diverge significantly, such flexibility (e.g., possibility of work shift choice) helps promote the reconciliation of personal and professional demands.

In interpreting the results, some limitations must be noted. Firstly, the participants in this study are all spouses/partners of police officers. Thus, there is no heterogeneity of the professional groups under study. In an attempt to overcome this limitation, we suggest the study to be extended to other professional groups that are subject to different working schedules. Secondly, the dissemination and distribution of online questionnaires was conducted by external elements (e.g., the presidents of unions) not the researchers themselves. This may have caused some bias in the sample. Finally, the cross-sectional design of the study does not allow a broader perspective on the impacts of shift work on family and social life over time.

In addition to the studies mentioned previously, further research may be carried out to deepen our knowledge of this issue, namely: i) comparing the reports of spouses/partners with the reports of workers themselves and ii) extending the range of reports about the impact of shift work on family and social life to other family members (e.g., children) and social circles (e.g., friends).

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