Psychosocial risks faced by olive workers in Spain: evaluated using the 'Mini Psychosocial Factors' questionnaire

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ABSTRACT

Background Spain has the largest olive-growing area in Europe. The goal of the present research is to evaluate the psychosocial risks faced by workers in the olive groves of Jaén (the largest olive grove region of Spain).

Method This method consists of 15 questions that analyse a total of 12 variables (mental load, demands, health, etc). A total of 502 questionnaires were completed. The method was performed using a non-stratified (with respect to the location of the growing areas) random selection with 'Universal Transverse Mercator' coordinates on a map of Jaen extracted from Andalusia region mapping. Multiple correspondence analysis, the Burt table and descriptive statistics (with a χ^2 test) have been used to analyse the results.

Results The responses of all the workers are identified in detail in the Burt table. Olive grove workers, regardless of their characteristics or the type of farm, are at a medium risk level for the different psychosocial factors (around 57% on average). The low-risk level is the next most common (around 36% on average). On average, only 7% of individuals are found at the high-risk level (only intensive olive groves exceed 10% of individuals at this risk level). Using multiple correspondence analysis, a video has been created to demonstrate the relationship between all the categories of all the variables studied from various perspectives in three dimensions. The first dimension captures mainly aspects of the social working environment (relation, recognition, support, compensation, control, mental load), whereas the second dimension captures mainly work demands (rhythm, demands). The third dimension is more about physical status (weight, body mass index).

Conclusion The risks found will improve injury prevention and are possibly caused by mismanagement of prevention. The extreme drought conditions of the 2022/2023 agricultural season could have affected the demands faced by workers.

INTRODUCTION

The agricultural sector in the southwest of Europe (Spain) requires a lot of labour, especially during the harvesting seasons (fruit and vegetables mainly). In this environment (bordering Africa), migrant workers account for around 40%–50% of the workforce.[1] High workloads, a lack of control and social support, role ambiguity, job insecurity, workplace violence and harassment, work–life imbalance, emotional demands, low wages, physical risks and difficulty in accessing medical services, etc,

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ The influence of climate change on the well-being of agricultural workers is well known. High workloads, lack of social support, job insecurity, work–life imbalance, low wages, etc are all affected by the new changes in the organisations (agricultural cooperatives and large farmes). In Andalusia (Spain), the psychosocial risks have been studied in workers of other crops but without the influence of climatic conditions.

WHAT THIS STUDY ADDS

⇒ This is the first study on psychosocial risks in the olive-growing sector where periods of drought can influence the demands placed on workers. Although the labour legislation is correctly laid out, its implementation is not very good.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Evaluating agricultural workers allows us to know their status within the sector, helps verify the sustainable production quality seal and allows employers and administrations to develop new plans for workplace improvements.

are among the psychosocial factors that will affect workers in one way or another. For this reason, the design, organisation and management of the work require special attention,[2] especially in rural areas. Indeed, in agricultural enterprises, whether family-run or not, poor labour relations can generate conflict and lead to low productivity, absenteeism, delays and poor emotional states among the workers.[3]

It is expected that climate change will impact the working conditions experienced by workers in the primary sector. The combined effects of temperature, humidity, solar radiation and wind could lead to worse working conditions. Greater fatigue will result in less productivity. The most affected zones will be in West Africa and South Asia (a 5% loss of productivity).[4]

The change in environmental conditions will also affect crops. Off-season droughts and floods are expected to become more frequent. Farmers, engineers and scientists will need to adapt. New technologies, supplies and seeds that are acclimatised

to every region of the planet will be needed; otherwise, classic cultivation areas may have to be abandoned.[5]

In short, adaptability to climate change is essential to produce safe and sustainable food. For this, the authorities must assist the agricultural sector via economic incentives[6] and new structural issues related to work organisation and psychosocial factors need to be addressed.[7]

Musculoskeletal disorders (MSDs) are closely related to psychosocial aspects such as stress, safety, well-being and working hours.[8] MSDs are exacerbated by a lack of social support (greater general pain: lumbar, cervical and shoulder), a lack of work control (joint pain in the elbows, hips and knees), dissatisfaction (pain in the arms, related to more than 10 years of agricultural experience), reconciling family life (damage to the lower trunk) and an inadequate social environment (bullying: musculoskeletal damage and stress).[9] When MSDs are chronic and stress is prolonged over time, it affects the endocrine system, making it difficult for the body to repair the musculoskeletal system, which will tend to become inflamed and cause pain, making it hard to return to work. However, inclusive health policies facilitate a successful return to work. Other factors that affect low back pain are long working hours, age and psychosocial aspects (stress, insomnia and discomfort), with older and younger people being more likely to suffer this type of injury, along with women and foreign workers. Workers need to be made aware of these risks to reduce this type of injury.[10]

The majority of immigrant agricultural workers in Spain, regardless of gender or occupation, are affected by low back pain, skin conditions, and stomach, respiratory and mental diseases.[11] However, in the olive-sector workplace, the occupational risk prevention plan (ORP) is in operation, whether through an internal company or not. This plan provides workers with ORP training and annual medical check-ups. Moreover, an employment contract, healthcare, unemployment benefits and access to trade unions are provided.[12] One of the main reasons why this study is justified is to improve the image of agricultural productions in southern Spain, a sector which is associated with a large number of immigrant workers.

The olive grove in Spain (mainly in Andalusian) is an environmental, cultural, territorial and gastronomic heritage, with a deep historical imprint (since the Phoenicians). It is vital for a large part of the Iberian fauna, as well as being a natural barrier against soil erosion and, therefore, against desertification. Olive oil is one of the healthiest vegetable fats (monounsaturated and polyunsaturated fatty acids). Olive wood is highly valued in woodworking. It is an excellent fuel and charcoal base.[13]

This research aims to detail the psychosocial status of olive-grove workers in the province of Jaén (Spain), differentiating by sex and other descriptive parameters present in the workers' environment, to improve injury prevention. To assess the psychosocial risks faced by these workers, the mini psychosocial factors (MPFs) method was employed. Additionally, it aims to relate the effect of drought on some psychosocial variables (mobbing, relations, health, recognition, autonomy, emotional, support, compensation, control, demands, mental load and rhythm) and the workers' environment (mainly sex, age, body mass index (BMI) and origin).

METHODS
Study settings and participants
In Spain, around 2.5 million hectares are dedicated to olive cultivation. Most of these are in Andalusia (60.80%), which is equivalent to 1.5 million hectares. Within this autonomous community, Jaén is the province with the largest surface area of olive groves, representing 23.12% of the Spanish total (578 000 ha) and 38.53% of the Andalusian olive-growing area.[14]

Olive-growing can be carried out conventionally, ecologically or as integrated production (with or without irrigation). Likewise, the tasks carried out may vary depending on the cultivation system used (mechanised, mixed and manual harvesting).[15]

To carry out the cultivation operations (planting, soil management, pruning, phytosanitary treatments and fertilisation), specific tools and equipment, such as tractors, brush cutters, chainsaws, scissors, espectugadores (axe-type adzes), woodchippers, fertilisers, atomisers, vibrators and blowers are required.

In this agricultural activity, the workforce is divided into two types: family and salaried. Workers can be 'self-employed' or 'employed' (working year-round or only for 3 months during harvesting, pruning and applying treatments). In addition, employees might concentrate exclusively on harvesting tasks.[15] Around 60% of the workforce in traditional olive-growing enterprises are family members. In addition, around 40% (total olive grove workers) are in the organic sector.[16]

For the method selection, a decision matrix was used,[17] which scored for each method's speed of application, the variables it studied, its statistical reliability and ease, its applicability to agriculture and its licence costs. Scores from 1 to 4 were assigned to the methods studied (there were four validated in Spain), opting for the one that obtained the highest score. The final choice was the MPF method, which proved to be more suitable in terms of its speed of application and the variables studied, compared with the other methods.[18]

MPF is a rapid method comprising 15 questions scored from 1 to 10. It assesses 12 psychosocial worker variables. It was scientifically validated in Spain using Karasek's demand-control framework.[18] The number next to the response chosen represents a quantitative score for assessing the twelve variables (qualitative–quantitative). To facilitate this assessment, an Excel sheet provided by the method's authors has been made available to collate the scores. These are calculated according to the scale for each parameter. Each variable (of the 12 described) has an associated value (category) high (H), medium (M) or low (L) depending on the risk (online supplemental appendix 1–3).

Data collection
The total number of agricultural workers in Jaén and the data for the last three agricultural seasons are shown in figure 1. A total of 54 173 workers were considered.

Approximately 2000 interviews were conducted in the field, obtaining a response rate of 25.10%, which is equivalent to 502 completed questionnaires. The degree of accuracy is equivalent to 4.36% (online supplemental appendix 2–3).

The data acquisition phase for the province of Jaén (Spain) was carried out from 27th January to second June 2023. The method to select the olive farms was performed using non-stratified (with respect to the location of the growing areas) random selection with UTM (Universal Transverse Mercator) coordinates on a map of Jaén taken from Andalusia region mapping.[19] These olive farms belong to individual farmers (with salaried workers) integrated into agricultural cooperatives. Following the selection, site visits were conducted, and farm owners were approached to seek permission for their workers to participate in a questionnaire survey. If permission was granted, a return date was scheduled and questionnaires were distributed to each worker. All the workers had labour contracts. The employer also acts as a worker. To recruit participants, workers were previously
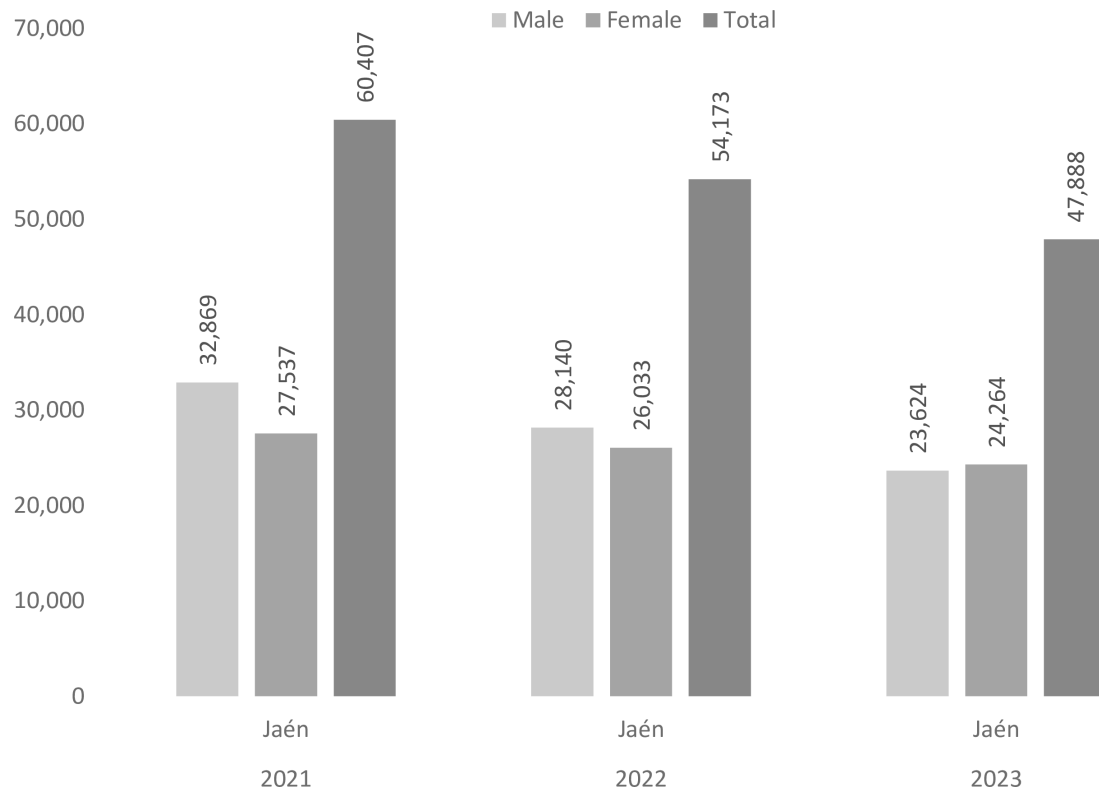
Figure 1 Special agrarian system affiliates (employees) by sex (Jaén-Spain). Average annual data accumulated up to September 2021/2022/2023.[39]

informed of the research purpose, the identity of those in charge, the subsequent use of the data and the confidentiality and privacy rules. The evaluators are people trained in occupational health and safety. They were previously prepared to address possible cultural, ethical and social differences.

A coding scheme was drawn up of the qualitative variables for the workers and their environment (table 1), as well as for the questionnaire answers (online supplemental appendix 1–3).

Statistical analysis

Multiple correspondence analysis (MCA) and descriptive statistical (with a χ^2 test and Burt table) analysis were performed using SPSS V.29 and XLSTAT2019 software, respectively. Binary and multinomial logistic regression was discarded because of the equation's non-significant components.

Patient and public involvement

Patients or the public were not involved in the design, execution, reporting or dissemination plans of our research.

RESULTS

As a summary of the Burt table (online supplemental appendix 3–3), table 2 shows the mode and frequencies for all the categories of each variable.

Olive grove workers, regardless of their characteristics or the type of farm, are at a medium risk level for the different psychosocial factors (around 57% on average). The low-risk level is the next most common (around 36% on average). At the high-risk level, on average, only 7% of individuals are found (only intensive olive groves exceed 10% of individuals at this risk level; table 2; online supplemental apendix 3–3).

Also, MCA has been used. For the model as a whole, the average variance explained is 16.114% (by dimension), the cumulative variance is 48.341% with a mean Cronbach's α

coefficient of 0.740 and a mean eigenvalue of 3.384. Therefore, the model can be considered reliable. Table 3 shows the discrimination values for each variable (the closer to 1, the more weight the value has in the dimension) with respect to each of the three model dimensions.

The first dimension captures mainly aspects of the social working environment (relation, recognition, support, compensation, control, mental load), whereas the second dimension captures mainly work demands (rhythm, demands). The third dimension is obviously more about physical status (weight, BMI). As one can see, the leading variable in the explanatory variables ranking for the variance of the homogeniser model ('mean' column in table 3) is 'rhythm' (0.336) since it presents the highest discrimination, followed in descending order of explanation by the variables 'compensation' (0.335), control (0.301), 'relations' (0.276), 'recognition' (0.274) and 'demands' (0.237). Although, in general, the average discriminations are small for the different qualitative variables of the individual, the following stand out: 'weight' (0.236) and 'BMI' (0.181). Graphically, it is easier to see the relationships between the 65 categories studied (figure 2).

One can observe that, with the inclusion of a third axis, the proximity relationship between categories does not vary much with respect to the two-dimensional graph, except for the greater distance of 'O6' in cluster 2, which, together with its low discrimination in the three dimensions (table 3) and infrequency (table 2), would make its relationship to this cluster's psychosocial categories irrelevant.

Cluster 1 includes three categories related to psychosocial risks: Mob-L (69.92%), Mob-H (3.98%) and Dem-M (87.25%). The mobbing variable has low discrimination values (table 3) which, together with the low frequency of the Mob-H category, would make it irrelevant in its relationships with other categories. This leaves only the 'Dem-M' category in its relationships

Table 1 Qualitative variables of the workers and their environment

Variable	Categories	Coding
Age	<25 years	T1
	Between 25 and 40 years	T2
	>40 years	T3
Body mass index (BMI=weight/height^2)	From 17.00 to 18.49 (kg/m^2)—low weight	W0
	From 18.50 to 24.99 (kg/m^2)—normal weight	W1
	From 25.00 to 29.99 (kg/m^2)—overweight	W2
	From 30.00 to 34.99 (kg/m^2)—chronic overweight	W3
	From 35.00 to 39.99 (kg/m^2)—premorbid obesity	W4
Crop area	<5 ha	S1
	Between 5 and 10 ha	S2
	>10 ha	S3
Cultivation system	Traditional mountain olive grove	O1
	Traditional olive grove with slopes <20%	O2
	Traditional olive grove without slopes	O3
	Intensive olive grove	O4
	Super Intensive olive grove	O5
	Organic olive grove (Traditional)	O6
Height	<1.60 m	A1
	Between 1.60 and 1.70 m	A2
	>1.70 m	A3
Irrigation system	Dryland	R0
	Irrigation	R1
Origin	African	Afr
	Spanish	Spa
	Eastern European	EurE
	Hispanic American	His
Sex	Male	ML
	Female	F
Weight	<70 kg	P1
	Between 70 and 80 kg	P2
	>80 kg	P3

with the environmental variables that most discriminate in the model's three dimensions (cultivation system 'O', height 'A', weight 'P' and BMI 'W'). BMI is a consequence of height and weight. Furthermore, 'O6' would be in another cluster. The 'cultivation system' (except O6) and 'BMI' could be considered relevant.

DISCUSSION

About 45% of the workers assessed were immigrants (table 2) of diverse nationalities (Moroccan, Algerian, Senegalese, Lithuanian, Romanian, Ecuadorian, etc). Half (50%) of these workers were African, 38% from Eastern Europe and the rest Hispanic Americans (12%). Such diversity of nationalities is often associated with vulnerable groups.[20] These percentages coincide with those of similar studies carried out on fruit and vegetable workers[21 22] 200 km from our study area.

The Burt table (online supplemental appendix 3–3) shows that the majority of Spanish workers (167 out of 277 workers) are in the T3 range (>40 years). This indicates the ageing of the local population and that the immigrant population has occupied this gap in the primary sector; however, this age problem also occurs in the other nationalities. The causes can be a fall in the birth rate and/or the depopulation of rural areas by the children of agricultural workers due to a lack of motivation and

social status.[23] It is important to focus on improving wages and providing decent employment contracts to avoid precariousness and a lack of interest in working in rural areas.[24]

Another aspect to highlight in this study is that most workers are male. Only 15% of workers in this study are women (table 2). Factors that could explain this[22] include family reconciliation activities and that the main occupation of women is in the olive-handling sector (agri-food industry); however, this would be more for sociocultural reasons than because of gender equality legislation.[25] The development of family reconciliation programmes (time flexibility, teleworking, reduced working hours, psychological support and open communication within the company) would especially help women balance their professional and personal lives.[26]

A very important datum is excess weight (W2, W3, W4; table 2 and figure 1), which presents in almost 67% of the workers; this coincides with other related studies on olive-growing in Jaén.[27] It shows that excess weight causes both musculoskeletal and psychosocial disorders. Workers who are in good physical condition, with no excess weight, have improved feelings of well-being, making it easier for them to deal with the workday.[28] In addition, promoting health programmes based on healthy lifestyles (nutrition and fitness) would help reduce eating, cardiovascular and psychological disorders.[29]

The psychosocial factor 'demands' refers to all the psychological demands that the work entails including the amount of work, the time available and interferences faced in carrying out the work, such as interruptions and external dependencies (online supplemental appendix 1–3). This said, the 2022/2023 olive harvest season in Spain (southwest Europe) experienced one of the most severe water deficits in history (drought; figure 3). This has led to a drastic reduction in olive production. Reduced production implies less labour required for the harvesting and processing of olives. Fewer workdays result in fewer economic resources (less prosperity and fewer job demands) for agricultural workers in the sector, and it even affects the prices of olive oil (less supply and higher prices for consumers). Prosperity and 'job demands' (online supplemental appendix 1–3) are among other things, fundamental pillars of the psychosocial conditions of workers,[2] so environmental factors are directly related to them.[4 5] In our study (table 2), about 90% of workers have Dem-M, while 54.98% have MeL-L and the rest MeL-M (there is no MeL-H). The decrease in workload during the 2022/2023 season could explain the low mental load in relation to task demands. The skills and abilities of workers do not fit well with the demands of the 2022/2023 agricultural season. These facts are also supported by the decrease in salaried workers (figure 1) in the province of Jaén for three consecutive years. In addition, this coincides with a severe drought in southwestern Europe (as already mentioned).

The study results (the predominant average psychosocial risk, except mobbing) suggest the importance of improving medium/long-term preventive measures to reduce the risks of psychosocial disorders in workers in this sector. This will improve injury prevention. One of the many improvement actions that could be carried out would be to implement sector-specific preventive surveillance and control systems that ensure the physical and mental health of workers in relation to the diseases they suffer or may suffer from,[30] together with continuing the periodic assessments that are already conducted.[31] In addition, integration and social support actions,[32] regularisation of personnel when appropriate,[9] providing food assistance[33] and maintaining

Table 2 Frequency and mode for the different qualitative variable categories

Variable	Category	Frequency	%	Variable	Category	Frequency	%
Sex*	F	77	15.34	Mobbing*	Mob-H	20	3.98
	ML†	425	84.66		Mob-L†	351	69.92
Age*	T1	52	10.36		Mob-M	131	26.10
	T2†	232	46.22	Relations*	Rel-H	8	1.59
	T3	218	43.43		Rel-L	169	33.67
Height*	A1	44	8.76		Rel-M†	325	64.74
	A2	171	34.06	Health*	Hea-H	38	7.57
	A3†	287	57.17		Hea-L	149	29.68
Weight*	P1	130	25.90		Hea-M†	315	62.75
	P2	157	31.27	Recognition*	Rec-H	69	13.75
	P3†	215	42.83		Rec-L	168	33.47
BMI*	W0	2	0.40		Rec-M†	265	52.79
	W1	164	32.67	Autonomy*	Aut-H	35	6.97
	W2†	236	47.01		Aut-L	206	41.04
	W3	87	17.33		Aut-M†	261	51.99
	W4	13	2.59	Emotional*	Emo-H	156	31.08
Crop area*	S1	108	21.51		Emo-L	29	5.78
	S2	75	14.94		Emo-M†	317	63.15
	S3†	319	63.55	Support*	Sup-L†	295	58.76
Irrigation system	R0	242	48,21		Sup-M	207	41.24
	R1†	260	51.79	Compensation*	Com-H	13	2.59
Cultivation system*	O1	138	27.49		Com-L	179	35.66
	O2	148	29.48		Com-M†	310	61.75
	O3†	186	37.05	Control*	Con-H	24	4.78
	O4	13	2.59		Con-L	149	29.68
	O5	11	2.19		Con-M†	329	65.54
	O6	6	1.20	Demands*	Dem-H	44	8.76
Origin*	Afr	113	22.51		Dem-L	20	3.98
	EurE	86	17.13		Dem-M†	438	87.25
	His	26	5.18	Mental load*	MeL-L†	276	54.98
	Spa†	277	55.18		MeL-M	226	45.02
Rhythm*	Rhy-H	10	1.99				
	Rhy-L	159	31.67				
	Rhy-M†	333	66.33				

* $\chi 2$ test ($p<0.05$).
†Mode.
BMI, body mass index.

Table 3 Discrimination values of the variables with respect to the three dimensions

	Dimension					Dimension			
Variables	1	2	3	Mean	Variables	1	2	3	Mean
Sex	0.007	0.000	0.000	0.003	Health	0.346	0.302	0.021	0.223
Age	0.002	0.017	0.074	0.031	Recognition	0.588	0.216	0.016	0.274
Crop area	0.007	0.003	0.031	0.014	Autonomy	0.368	0.141	0.010	0.173
Cultivation system	0.015	0.003	0.165	0.061	Emotional	0.264	0.162	0.005	0.143
Height	0.005	0.022	0.172	0.066	Support	0.358	0.001	0.012	0.124
Weight	0.004	0.036	0.668	0.236	Compensation	0.665	0.330	0.011	0.335
BMI	0.001	0.004	0.537	0.181	Control	0.541	0.345	0.019	0.301
Origin	0.016	0.017	0.186	0.073	Demands	0.245	0.452	0.013	0.237
Irrigation system	0.000	0.002	0.074	0.025	Mental load	0.637	0.000	0.006	0.214
Rhythm	0.478	0.515	0.014	0.336					
Mobbing	0.080	0.046	0.047	0.058	Active total	5.106	2.962	2.083	3.384
Relations	0.476	0.349	0.002	0.276	% variance	24.315	14.106	9.920	16.114

BMI, body mass index.
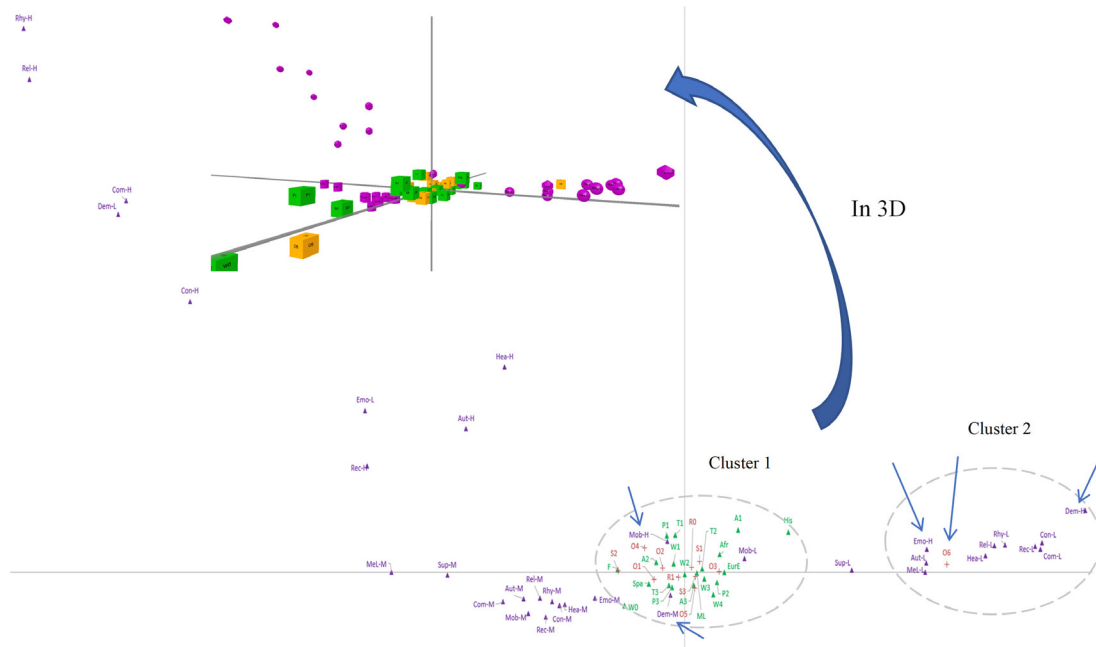
Figure 2 Relationship of all the categories studied in two and three dimensions (https://youtu.be/5hTAr4ZtIOQ). The MPF-related categories are indicated by '▲-purple'. Those referring to the individual characteristics of workers (age, sex, height, weight, BMI and origin) appear as '▲-green'. Those related to the crop (crop area, cultivation system and irrigation system) are indicated by '+'. Clusters with the most discriminating significant categories for each dimension (celestial arrows) can also be seen. BMI, body mass index; MPF, mini psychosocial factor.

a good working environment that avoids conflicts[3] could help reduce the average psychosocial risk detected in the present study. Nonetheless, actions of this type are already offered by the Spanish authorities, and it is clear that they do not reach all of the vulnerable population. Spain is a country whose ORP legislation strictly complies with the guidelines issued by the European Union.[12]

Psychosocial, organisational and musculoskeletal risk factors are closely related.[34] Reducing work pressure, introducing breaks during the working day[35] and increasing risk assessments[36] would also be necessary improvement actions.

Currently, the food consumed in the European Union needs requirements not only in terms of product quality (olives, tomatoes, peppers, lettuce, etc) but also in terms of the conditions under which they are produced.[37] These conditions are subject to continuous improvement and assessment in Andalusia (the southern region of Spain), where interaction between local workers and immigrants is high, as demonstrated in this and related research.[22] Fortunately, the results tend towards good coexistence at work without the high risks found in other agricultural sectors being apparent (fruit and vegetable greenhouses in southern Spain).

If agricultural products are of good quality, farmed with respect for the environment and obtained under healthy working conditions, they are awarded the seal of being sustainable products,[38] which is a distinguishing feature over products from third countries. It is also a reason for this research.
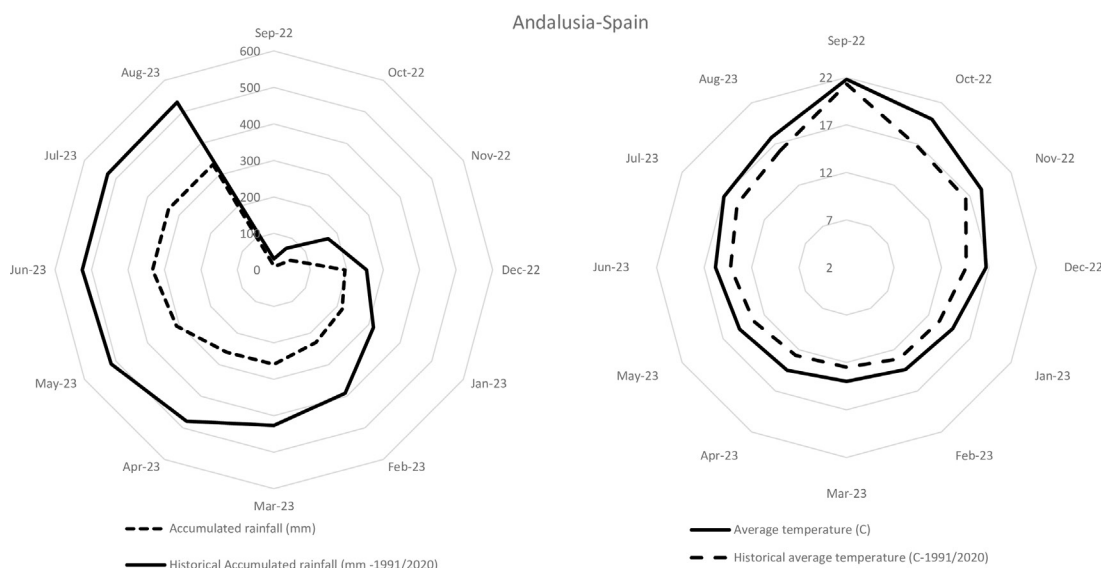
Figure 3 Andalusia climatic data 2022/2023. Also, historical average temperature and accumulated rainfall (1991–2020).[40]

Regarding the limitations of this work, a second psychosocial risk questionnaire would have complemented the research with other variables that the MPF method does not include. Other variables impacting the workers' environment could have been studied, such as the level of education, relationship with other risks, family balance and the type of prevention service, etc. Likewise, a higher response rate would have been desirable. Finally, an update/compilation of Spanish legislation on ORP may be necessary since this legislation dates from 1995 onwards and the various updates are scattered over time.

CONCLUSION

Our research has revealed that the psychosocial conditions of olive-grove workers in Jaén (Spain) are acceptable. There is no high risk present in any of the variables studied, but there is a medium risk. This is not a problem of legislation, but rather a management issue, which prevents measures included in legislation from fully reaching the most vulnerable workers. Workers who are in good physical condition and not overweight have a better feeling of well-being. The average age of Spanish and foreign agricultural workers is over 40 years old. In addition, the extreme drought conditions of the 2022/2023 agricultural season could have affected the demands placed on workers. This last relationship is very relevant.

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APPENDIX 1-3. MPF QUESTIONNAIRE[18]
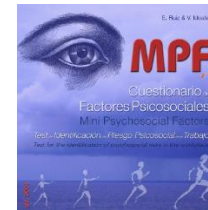
Questions

1. Are you in satisfactory health?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

2. Are your relationships with your co-workers generally good?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

3. Do you enjoy your work?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

4. Do you have enough time to carry out your tasks?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

5. Are you able to make decisions in your work?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

6. Do you suffer any stress because of a co-worker?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

7. Is your work commonly interrupted?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

8. Are your efforts recognized by your superiors?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

9. Do you have the right tools/other means to do your job?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

10. Are you able to concentrate in your work?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

11. Do you get too emotionally involved in your work?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

12. Can you undertake your tasks at a reasonable rate?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

13. Does any co-worker repeatedly mistreat any other?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

14. Is your workload too heavy?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

15. Do you have any means at your disposal that would help you improve your work?
 1-not all-/very-2   3-poor-4   5-normal-6   7-quite good-8   9-good-10

MPF Method Variables	Risk Ratios
Autonomy (Aut), Compensation (Com), Control (Con), Emotional (Emo), Health (Hea), Mobbing (Mob), Recognition (Rec), Relations (Rel), Rhythm (Rhy) and Support (Sup)	> 1 < 4 = High (H) > 4 and < 7 = Medium (M) > 7 and < 10 = Low (L)
Demands at work (Dem)	< 1 < 4 = High (H) > 4 and < 7 = Medium (M) > 7 and < 10 = Low (L)
Mental Load (MeL)	< 1 < 7 = High (H) > 7 and < 14 = Medium (M) > 14 and < 20 = Low (L)

Description of the variables assessed

- **Autonomy (Aut):** the degree of worker autonomy or decision-making capacity (question 5).
- **Compensation (Com):** referring to the appreciation between colleagues and clients, status control, moral and economic recognition, assessment of effort and perceived competencies at work (questions 3 and 8).
- **Control (Con):** Control over work includes developing the skills, learning, and training to effectively respond to job demands and develop professionally (questions 5 and 12).
- **Demands (Dem):** are all the psychological demands of the job including the amount of work, the time available and interferences in carrying out the work, such as interruptions and external dependencies (questions 4, 7, 10 and 14).
- **Emotional (Emo):** is the degree of emotional involvement of the group in performing tasks and work projects; this includes human interaction skills, teamwork, customer relations and high involvement in the initial stages of projects (question 11).
- **Health (Hea):** an assessment of the perception of individual and collective mental and physical health (question 1).
- **Mental Load (MeL):** the degree of requirement and intellectual effort at work is related to the demands imposed, the amount of information, the attention required, and the complexity and subjective perception of the difficulty. It is the result of adding the values of Support, Control, and Compensation, and subtracting the value for Demands.
- **Mobbing (mob):** refers to the presence or absence of behaviours that may lead to situations of mobbing or harassment towards individuals who are part of the unit or group (questions 6 and 13).
- **Recognition (Rec):** is the assessment made by directors and/or managers of the tasks performed and the achievements of their subordinates (question 8).
- **Relations (Rel):** considers the human and work interactions between individuals that are part of a unit, together with the communication between them. This also includes relationships arising from interaction with clients, if any (questions 2, 11 and 15).
- **Rhythm (Rhy):** refers to the pace of work that workers have to follow individually and collectively while performing tasks; this in turn relates to the psychological demands of the work: time limitation, work volume and interruptions (questions 4 and 12).
- **Support (Sup):** is the degree of fundamental work support received from peers and superiors: a positive atmosphere, respect, and teamwork. It also involves help in resolving problems and technical doubts while carrying out the different work tasks. (questions 2 and 9).

1

Supplemental material

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APPENDIX 2-3. Sample Error.

The proposed sample size was "$n = \frac{N \cdot Z_a^2 \cdot p \cdot q}{d^2 \cdot (N-1) + Z_a^2 \cdot p \cdot q}$", where: p= is the expected frequency of the factor to study. If not known, use p=0.5 (50%) that maximizes the sample size; d= precision or error admitted; q= 1-p; N= total population; Za= 1.962 for a confidence level of 95%.

With values of d=5.0%, p=0.5 and a confidence level of 95%

$$n = \frac{54173 \cdot 1.962^2 \cdot 0.5 \cdot 0.5}{0.05^2 \cdot (54173 - 1) + 1.962^2 \cdot 0.5 \cdot 0.5} = 382.24$$

Thus, the workers to study will be 383. During the field work, 2,000 interviews were carried out, the response rate being 25.10%; that is, 502 questionnaires were completed. For this reason, the admitted error (d ') was less:

$$n = \frac{54173 \cdot 1.962^2 \cdot 0.5 \cdot 0.5}{d'^2 \cdot (54173 - 1) + 1.962^2 \cdot 0.5 \cdot 0.5} = 502$$

So, d'= 0.04358, which is equivalent to an accuracy of 4.36%.

	F	ML	T1	T2	T3	S1	S2	S3	O1	O2	O3	O4	O5	O6	A1	A2	A3	P1	P2	P3	W0	W1	W2	W3	W4	Afr	EurE	His	Spa	R0	R1	Rhy-H	Rhy-L	Rhy-M	Mob-H	Mob-L	Mob-M	Rel-H	Rel-L	Rel-M	Hea-H	Hea-L	Hea-M	Rec-H	Rec-L	Rec-M	Aut-H	Aut-L	Aut-M	Emo-H	Emo-L	Emo-M	Sup-L	Sup-M	Com-H	Com-L	Com-M	Con-H	Con-L	Con-M	Dem-H	Dem-L	Dem-M	Mel-L	Mel-M
F	77	0	7	32	38	12	18	47	20	24	28	3	2	0	16	23	38	23	18	36	0	23	33	19	1	14	14	5	44	41	36	1	23	53	2	53	22	2	26	49	6	20	51	16	19	42	7	27	43	22	7	48	45	32	2	19	56	4	19	54	3	4	70	38	39
ML	0	425	45	200	180	96	57	272	118	124	158	10	9	6	28	148	249	107	139	179	1	141	203	68	12	99	72	21	233	201	224	9	136	280	18	298	109	6	143	276	32	129	264	53	149	223	28	179	218	134	22	269	250	175	11	160	254	20	130	275	41	16	368	238	187
T1	7	45	52	0	0	12	8	32	9	16	24	1	1	1	2	25	25	12	21	19	0	15	27	8	2	10	14	7	21	23	29	4	17	31	1	38	13	0	16	36	4	18	30	6	16	30	3	22	27	19	1	32	28	24	2	21	29	4	17	31	5	7	40	25	27
T2	32	200	0	232	0	54	28	150	73	66	78	6	9	0	21	77	134	45	60	113	2	86	105	34	5	61	53	8	110	107	125	3	84	145	9	159	64	4	80	148	14	68	150	40	79	113	15	101	116	79	14	139	134	98	6	85	141	12	77	143	22	7	203	129	103
T3	38	180	0	0	218	42	39	137	56	66	84	6	1	5	21	69	128	45	60	113	0	63	104	45	6	42	19	11	146	112	106	3	58	157	10	154	54	4	73	141	20	63	135	23	73	122	17	83	118	58	14	146	133	85	5	73	140	8	55	155	17	6	195	122	96
S1	12	96	12	54	42	108	0	0	50	39	17	0	0	2	13	41	54	25	38	45	0	30	57	17	4	25	16	5	62	69	39	3	34	71	3	75	30	1	37	70	6	40	62	18	40	50	11	46	51	30	5	73	65	43	4	41	63	6	33	69	10	5	93	62	46
S2	18	57	8	28	39	0	75	0	26	34	9	3	0	3	11	33	31	26	25	24	1	24	39	9	2	16	8	3	48	47	28	2	18	55	2	52	21	2	25	48	7	22	46	11	20	44	7	26	42	19	5	51	38	37	1	24	50	7	17	51	4	1	70	39	36
S3	47	272	32	150	137	0	0	319	62	75	160	10	11	1	20	97	202	79	94	146	1	110	140	61	7	72	62	18	167	126	193	5	107	207	15	224	80	5	107	207	25	87	207	40	108	171	17	134	168	107	19	193	192	127	8	114	197	11	99	209	30	14	275	175	144
O1	20	118	9	73	56	50	26	62	138	0	0	0	0	0	9	39	90	30	43	65	0	39	78	17	4	32	14	7	85	98	40	3	46	89	6	97	35	2	44	92	8	38	92	18	43	77	15	45	78	39	9	90	79	59	2	43	93	8	38	92	8	5	125	73	65
O2	24	124	16	66	66	39	34	75	0	148	0	0	0	0	11	58	79	37	48	63	1	41	76	24	6	21	26	7	94	81	67	2	43	103	5	100	43	2	52	94	12	46	90	26	45	77	15	60	73	48	7	93	79	69	5	51	94	12	43	96	12	7	129	78	70
O3	28	158	24	78	84	17	9	160	0	0	186	0	0	0	20	68	98	54	57	75	0	73	68	42	3	59	35	12	80	56	130	5	59	122	7	134	45	3	65	118	16	55	115	20	69	97	3	87	96	58	12	116	120	66	5	72	109	5	57	124	20	7	159	107	79
O4	3	10	1	6	6	0	3	10	0	0	0	13	0	0	3	2	8	3	3	7	0	1	8	4	0	1	2	0	10	3	10	0	7	6	1	7	5	1	1	11	2	4	7	2	5	6	1	5	7	5	1	7	5	7	1	3	9	3	1	9	3	1	9	7	6
O5	2	9	1	9	1	0	0	11	0	0	0	0	11	0	1	3	7	5	2	4	0	6	4	0	0	0	9	0	2	1	10	0	2	9	0	9	2	1	2	9	0	4	7	2	3	6	0	6	5	2	0	9	7	4	1	5	5	1	4	6	1	3	10	6	5
O6	0	6	1	0	5	2	3	1	0	0	0	0	0	6	0	1	5	1	4	1	0	0	2	0	0	0	0	0	6	3	3	0	2	4	0	4	1	0	5	1	0	2	4	1	3	2	1	3	2	4	0	2	5	1	1	2	4	0	6	5	1
A1	16	28	2	21	21	13	11	20	9	11	20	3	1	0	44	0	0	30	9	5	0	18	15	8	3	15	5	5	19	26	18	1	18	25	1	34	9	1	18	25	3	19	22	5	17	22	4	18	22	15	2	27	29	15	3	19	22	3	11	30	5	2	37	26	18
A2	23	148	25	77	69	41	33	97	39	58	68	2	3	1	0	171	0	67	66	38	0	57	79	33	2	33	36	11	91	85	86	4	53	114	4	116	51	5	52	114	17	53	101	26	52	93	11	65	95	44	14	113	99	72	3	56	112	9	49	113	16	8	147	89	82
A3	38	249	25	134	128	54	31	202	90	79	98	8	7	5	0	0	287	33	82	172	2	89	1422	46	8	65	45	10	167	131	156	5	88	194	15	201	71	2	99	186	18	77	192	38	99	150	20	123	144	97	13	177	167	120	7	104	176	12	89	186	23	10	254	161	126
P1	23	107	12	73	45	25	26	79	30	37	54	3	5	1	30	67	33	130	0	0	2	105	23	0	0	42	20	13	55	63	67	5	48	77	7	84	39	1	44	81	12	48	70	19	37	74	13	44	73	40	8	82	71	59	4	49	77	8	35	87	14	8	108	69	61
P2	18	139	21	76	60	38	25	94	43	48	57	3	2	4	9	66	82	0	157	0	1	51	96	10	0	31	35	6	85	74	83	2	53	102	3	115	39	1	53	103	8	46	103	21	60	76	11	74	72	49	11	97	96	61	2	54	101	4	52	104	13	4	140	93	64
P3	36	179	19	83	113	45	24	146	65	63	75	7	4	1	5	38	172	0	0	215	0	8	117	77	13	40	31	7	137	105	110	3	58	154	10	152	53	2	72	141	18	55	142	29	71	115	11	88	116	67	10	138	128	87	7	76	132	12	61	142	17	8	190	114	101
W0	1	1	0	2	0	0	1	1	0	1	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	2	1	0	1	0	0	2	1	0	0	1	2	0	0	2	1	0	2	1	1
W1	23	141	15	86	63	30	24	110	39	41	73	1	6	0	18	57	89	105	51	8	0	164	0	0	0	57	25	8	74	66	98	3	53	108	8	110	46	4	54	106	13	50	101	22	48	94	16	61	87	51	10	103	92	72	2	58	104	6	47	111	13	7	144	88	76
W2	33	203	27	105	104	57	39	140	78	76	68	8	4	2	15	79	142	23	96	117	0	0	236	0	0	35	45	13	143	126	110	6	72	158	7	166	63	3	81	152	15	71	150	33	79	124	14	102	120	74	13	149	139	97	8	81	147	14	71	151	24	7	202	131	105
W3	19	68	8	34	45	17	9	61	17	24	42	4	0	0	8	33	46	0	10	77	0	0	0	87	0	18	15	4	50	40	47	1	28	58	5	65	17	1	29	57	10	22	55	10	34	43	4	37	46	27	6	54	55	32	2	34	51	4	28	55	7	3	77	49	38
W4	1	12	2	5	6	4	2	7	1	6	3	0	0	0	3	2	8	0	0	13	0	0	0	0	13	0	0	0	9	5	8	0	9	4	0	5	8	0	5	8	0	5	7	3	2	9	8	5	1	5	7	3	0	13	0	7	7	0	3	10	0	0	13	7	6
Afr	14	99	10	61	42	25	16	72	32	21	59	1	0	0	15	33	65	42	31	40	2	57	35	18	3	113	0	0	0	44	69	3	39	71	4	77	32	3	48	62	12	35	66	12	44	57	7	49	57	42	6	65	67	46	2	46	65	5	33	75	11	6	96	62	51
EurE	14	72	14	53	19	16	8	62	14	26	35	2	9	0	5	36	45	20	35	31	0	25	45	15	1	0	86	0	0	33	53	0	28	58	3	62	21	0	27	59	6	33	47	17	28	41	8	39	39	30	1	55	54	32	2	35	49	5	30	51	13	2	71	43	43
His	5	21	7	8	11	5	3	18	7	7	12	0	0	0	5	11	10	13	6	7	0	8	13	4	1	0	0	26	0	22	4	1	13	12	0	22	4	0	9	17	3	13	10	2	11	13	3	13	10	11	0	15	17	9	1	12	13	2	6	18	1	1	24	18	8
Spa	44	233	21	110	146	62	48	167	85	94	80	10	2	6	19	91	167	55	85	137	2	74	143	50	8	0	0	0	277	143	134	6	79	192	13	190	74	5	85	187	17	68	192	38	85	154	17	105	155	73	22	182	157	120	8	86	183	12	80	185	19	11	247	153	124
R0	41	201	23	107	112	69	47	126	98	81	56	3	1	3	26	85	131	63	74	105	1	66	126	40	9	44	33	22	143	242	0	4	78	160	12	169	61	4	82	156	16	74	152	35	91	116	21	99	122	76	15	151	139	103	5	90	147	13	73	156	24	11	207	136	106
R1	36	224	29	125	106	39	28	193	40	67	130	10	10	3	18	86	156	67	83	110	1	98	110	47	4	69	53	4	134	0	260	6	81	173	8	182	70	4	87	169	22	75	163	34	77	149	14	107	139	80	14	156	158	104	8	89	163	11	76	173	20	9	231	140	120
Rhy-H	1	9	4	3	3	3	2	5	3	2	5	0	0	0	1	4	5	5	2	3	0	3	6	1	0	3	0	1	6	4	6	10	0	0	0	0	0	3	0	7	6	0	3	0	0	9	3	0	7	0	0	9	2	8	0	7	2	0	0	9	3	0	10	0	10
Rhy-L	23	136	17	84	58	34	18	107	46	43	59	7	2	2	18	53	88	48	53	58	0	53	72	28	9	39	28	13	79	78	81	0	159	0	6	118	35	0	95	64	7	101	51	4	110	45	9	94	56	87	6	66	122	37	0	110	49	0	91	68	40	0	119	137	22
Rhy-M	53	280	31	145	157	71	55	207	89	103	122	6	9	4	25	114	194	77	102	154	1	108	158	58	8	71	58	12	192	160	173	0	0	333	14	223	96	5	74	254	25	48	260	60	58	215	23	112	198	69	18	246	171	162	8	69	256	16	58	259	4	12	317	139	194
Mob-H	2	18	1	9	10	3	2	15	6	5	7	1	0	0	1	4	15	7	3	10	7	3	7	5	0	4	3	0	13	12	8	0	6	14	20	0	0	6	14	6	3	0	17	6	6	6	2	13	6	13	0	6	14	20	0	6	14	0	6	14	0	0	34	6	14
Mob-L	53	298	38	159	154	75	52	224	97	100	134	7	9	4	34	116	201	84	115	152	1	110	166	65	9	77	62	22	190	169	182	0	118	223	0	351	0	6	126	219	24	109	218	42	136	173	28	165	158	111	22	273	142	78	10	142	199	24	119	208	25	16	310	234	117
Mob-M	22	109	13	64	54	30	21	80	35	43	45	5	2	1	9	51	71	39	39	53	0	46	63	17	4	32	21	4	70	61	70	0	35	96	0	0	131	2	29	100	11	40	80	19	36	86	13	33	97	32	7	92	22	109	3	31	97	0	20	111	13	4	114	36	95
Rel-H	2	6	0	4	4	1	2	5	2	2	3	1	1	0	1	5	2	1	1	2	0	4	3	1	0	3	0	0	5	4	4	3	0	5	4	6	2	8	0	0	6	0	2	4	0	4	4	0	8	3	0	5	3	0	8	4	0	5	2	0	5	3	0	8
Rel-L	26	143	16	80	73	37	25	107	44	52	65	1	2	5	18	52	99	44	53	72	0	54	81	29	5	48	27	9	85	82	87	0	95	74	14	126	29	0	169	0	14	84	71	14	105	50	12	99	58	114	0	55	139	30	0	115	54	0	111	58	24	0	145	146	23
Rel-M	49	276	36	148	141	70	48	207	92	94	118	11	9	1	25	114	186	81	103	141	2	106	152	57	8	62	59	17	187	156	169	7	64	254	6	219	100	0	0	325	18	65	242	51	63	211	19	107	199	42	25	258	156	169	10	64	251	20	38	267	20	15	290	130	195
Hea-H	6	32	4	14	20	6	7	25	4	12	16	2	0	0	3	17	18	12	8	18	0	13	15	10	0	12	6	3	17	16	22	6	7	25	3	24	11	6	14	18	64	0	0	13	11	14	5	14	18	5	1	27	10	14	5	11	21	5	13	18	7	0	64	7	27
Hea-L	20	129	18	68	63	40	22	87	38	46	55	7	4	2	19	53	77	48	46	55	1	50	71	22	5	35	33	13	70	74	75	0	101	48	0	109	40	0	84	65	0	149	0	4	94	31	9	83	37	31	0	170	128	31	0	104	45	0	72	31	0	118	128	21
Hea-M	51	264	30	150	135	62	46	207	92	90	115	7	4	7	22	101	192	70	103	142	1	101	150	55	8	66	47	10	192	152	163	4	51	260	17	218	80	2	71	242	0	0	315	52	63	200	21	101	193	76	24	243	152	161	8	64	243	15	69	231	6	9	300	135	180
Rec-H	16	53	6	40	23	18	11	40	18	12	16	2	2	1	5	26	38	19	21	29	1	22	33	10	3	12	17	3	35	35	34	5	4	60	8	42	19	4	14	51	13	4	52	60	0	0	9	42	16	14	1	54	33	12	3	15	36	13	0	56	11	7	51	3	13
Rec-L	19	149	16	79	73	40	20	108	43	45	69	5	3	3	17	52	99	37	60	71	1	48	79	34	6	44	28	11	85	91	77	0	110	58	6	136	26	0	105	63	11	94	63	0	168	0	15	111	51	83	6	111	79	50	13	144	50	0	143	25	0	96	72	31	13
Rec-M	42	223	30	113	122	50	44	171	77	77	97	6	6	2	22	93	150	74	76	115	0	94	124	43	7	49	41	13	154	116	149	5	45	215	6	173	86	4	50	211	14	51	200	0	0	265	14	77	174	50	11	204	132	133	0	36	229	13	46	206	10	7	248	110	155
Aut-H	7	28	3	15	17	11	7	17	15	15	3	1	0	1	4	11	20	13	11	11	0	16	14	4	1	7	8	3	21	21	14	3	9	23	2	28	13	1	12	19	5	9	21	9	15	14	35	0	0	12	5	18	17	18	4	3	28	8	3	24	0	0	29	9	26
Aut-L	27	179	22	101	83	46	26	134	45	60	87	5	6	3	18	65	123	44	74	88	1	61	102	37	5	49	39	13	105	99	107	0	94	112	13	165	33	0	107	94	11	91	101	18	111	77	0	206	0	86	10	110	154	52	0	126	80	0	127	79	38	0	168	172	34
Aut-M	43	218	27	116	118	51	42	168	78	73	96	7	5	2	22	95	144	73	72	116	1	87	120	46	7	57	39	10	155	122	139	7	56	198	6	158	97	4	58	199	19	49	193	36	51	174	0	0	261	58	14	189	124	147	9	60	202	16	19	226	6	14	241	95	166
Emo-H	22	134	19	79	58	30	19	107	39	48	58	5	2	4	15	44	97	40	49	67	1	51	74	27	4	42	30	11	76	78	80	0	87	69	13	111	32	0	114	42	9	71	76	24	14	131	114	42	42	156	0	0	112	44	1	89	66	1	81	74	24	1	131	114	42
Emo-L	22	89	12	54	42	19	11	77	18	23	69	5	1	0	2	14	13	8	11	18	0	10	13	6	1	6	1	0	22	16	22	5	6	18	1	22	7	1	0	25	1	0	24	1	15	11	1	14	14	0	112	0	17	5	7	11	14	1	5	20	2	2	54	11	11
Emo-M	48	269	32	139	146	73	51	193	90	93	116	9	7	2	27	113	177	82	97	138	2	103	149	54	9	65	55	15	182	151	166	5	66	246	7	218	92	4	55	258	23	75	219	34	77	149	14	107	139	80	17	317	171	146	6	90	221	18	64	235	20	14	283	154	163
Sup-L	24	250	28	134	133	65	38	192	79	79	120	5	7	5	15	99	167	71	96	128	1	92	139	55	8	67	34	17	157	139	156	2	122	171	0	273	22	0	139	156	19	122	154	14	144	132	17	154	124	112	12	171	295	0	3	148	144	8	121	166	29	5	261	239	56
Sup-M	32	175	24	98	85	43	37	127	59	69	66	8	4	1	15	72	120	59	61	87	1	72	97	32	5	46	32	9	120	103	104	8	37	162	20	78	109	8	30	169	19	27	161	16	44	133	18	52	147	44	17	146	0	207	10	31	166	16	28	163	15	15	177	37	170
Com-H	2	11	2	6	5	4	1	8	2	5	3	1	1	1	3	3	7	4	2	7	0	2	8	2	0	2	2	1	5	5	8	8	0	8	0	10	3	8	0	10	5	0	8	3	13	0	4	0	9	1	7	6	3	10	13	0	0	0	0	13	0	0	5	3	13
Com-L	19	160	21	85	73	41	24	114	43	51	72	4	1	2	19	56	104	49	54	76	1	58	81	34	5	46	35	12	86	90	89	0	110	69	6	142	31	0	115	64	11	104	64	0	143	36	3	126	50	89	0	90	148	31	0	179	0	0	109	70	38	0	141	173	6
Com-M	56	254	29	141	140	63	50	197	93	92	109	9	5	2	22	112	176	77	101	132	1	104	147	51	7	65	45	13	183	147	163	5	49	256	14	199	97	5	54	251	22	45	243	56	25	229	28	80	202	66	23	221	144	166	0	0	310	20	40	250	6	15	289	103	207
Con-H	4	20	4	12	8	6	7	11	8	9	5	1	0	0	3	9	12	8	4	12	0	6	14	4	0	5	5	2	13	13	11	0	9	16	0	24	0	0	11	8	5	0	15	13	0	14	8	0	16	1	0	18	8	16	0	0	20	24	0	0	8	7	9	0	13
Con-L	19	130	17	77	55	33	17	99	38	43	57	3	1	6	11	49	89	35	53	61	0	47	71	28	3	33	30	6	76	73	76	0	91	58	10	119	20	0	111	38	10	70	78	0	103	36	12	80	127	19	16	163	121	28	0	109	70	0	238	0	13	0	148	140	9
Con-M	54	275	31	143	155	69	51	209	92	96	124	9	6	2	30	113	186	87	100	142	2	111	151	55	10	75	51	18	185	156	173	2	68	259	10	208	111	4	58	267	19	79	231	51	72	206	24	79	226	74	20	235	166	163	9	0	329	13	11	305	136	193
Dem-H	3	41	5	22	17	10	4	30	8	12	20	3	1	0	5	16	23	14	13	17	1	13	24	7	0	11	13	1	24	24	20	8	0	40	4	25	13	0	24	0	4	0	20	0	0	14	0	38	6	0	31	13	44	0	0	32	0	13	0	29	9	26	44	20	20
Dem-L	4	16	7	7	1	5	1	14	5	7	7	1	3	1	2	8	10	8	4	12	1	7	7	3	2	6	2	1	11	11	9	5	0	16	4	5	0	5	0	15	5	0	9	7	1	10	0	34	14	2	2	20	5	15	7	0	11	0	0	13	0	0	22	0	20
Dem-M	70	368	40	203	195	93	70	275	125	129	159	9	10	6	37	147	254	108	140	190	2	144	202	77	13	96	71	24	247	207	231	2	119	317	14	310	114	3	145	290	20	118	300	53	137	248	29	168	241	131	24	283	261	177	8	141	289	15	118	305	0	0	438	244	194
Mel-L	38	238	25	129	122	62	39	175	73	78	107	7	6	5	26	89	161	69	93	114	1	88	131	49	7	62	43	18	153	136	140	0	137	139	6	234	36	0	146	130	7	128	135	3	160	110	9	172	95	114	8	154	239	37	0	173	103	0	140	136	32	0	244	276	0
Mel-M	39	187	27	103	96	46	36	144	65	70	79	6	5	1	18	82	126	61	64	101	1	76	105	38	6	51	43	8	124	106	120	10	22	194	14	117	95	8	23	195	25	21	180	63	8	155	26	34	166	42	21	163	56	170	13	6	207	24	9	193	12	20	194	0	226

Appendix 3-3