

ARE SPANISH PUBLIC EMPLOYEES HAPPIER IN THEIR WORK PERFORMANCE IN THE INDUSTRY 4.0 ERA?

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Abstract: Several studies in the literature indicate the link between socio-psychological factors at work with the degree of satisfaction or perceived happiness. However, there are still few analyzes that expressly address this relationship in the public sector workers, compared to those in the private sector. This paper aims to find out if the public sector employees are happier than the private sector, by associating happiness to some of these factors in Spain. Results show that employees in the public sector are indeed happier than those in private one. In terms of pay, safety and perceived stress levels, there are association relationships to employee happiness. This research provides very useful information for those firm managers who are responsible for human resources policies related to these factors: salary, security and stress.

Keywords: Happiness, satisfaction, human resources, human resources policies, Industry 4.0, public sector, private sector.

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Introduction

Since the late 20th century, economists have been attracted to studying the Economics of Happiness (Singh & Alexandrova, 2020). The use of the term happiness characterizes an important volume of this bibliographical production as a synonym of the words satisfaction, well-being, or quality of life (Teixeira & Vasque, 2020; Carlquist et al., 2017). Under this umbrella, the Happiness Management culture teaches us that a management model oriented to the holistic search for happiness or job satisfaction of its employees is one of the most important axial pieces that organizations have applied to increase the commitment of their human capital (Hanif, Rakhman, Nurkholis, & Pirzada, 2019), and therefore, their productivity and business performance (Ravina et al., 2019). Public administration employees are not exempt from this reality, which is characterized

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by job stability compared to the private company employees (Husaini, Pirzada, Saiful 2020). This article is dedicated to them. The era of Industry 4.0 is a period that is characterized, among other things, by the high level of precariousness in employment that is caused by the implementation of management models based on product and service innovation (Arniati, Puspita, Amin, Pirzada, 2019). This phenomenon is derived from the technological perspective by the automation and massive robotization of the productive processes and the supply chain. Together with companies digitalization, both factors are very present in today's productive ecosystems (Bragazzi, 2020; Ghadge et al., 2020). Following the above, a more holistic examination of this issue seems likely to show a strong interest among people to enter into mainstream government work. In this way, such individuals can obtain an indefinite contract or tenure for their entire working life (Pirzada, Mustapha, & Alfán, 2017). As is well known, this fact is mainly accentuated in countries with high unemployment levels, such as Spain, where the unemployment rate is 20.1% in mid-2020 (INE, 2020). In the collective imagination of citizens, there is a conviction that this type of work constitutes ambrosia of eudaimonic happiness, job security, and quality of life, especially in times of crisis, such as the present one, amid the SARS-Cov2 virus pandemic (Fernández-Urbano & Kulic, 2020). In this sense, it should be noted that in the 21st century there has been a growing interest in researching the job satisfaction of public employees (eg. Ryu & Bae, 2020; Steijn & Van der Voet, 2019).

Literature Review

Most of the studies on this scientific topic to date empirically show that public sector workers are happier than individuals who practice their profession in the private sector. This is basically due to the intrinsic benefits (flexibility, vacations, or family conciliation, among others) offered by this type of governmental entity concerning for-profit organizations (Lahat & Ofek, 2020; Sánchez-Sánchez & Fernández-Puente, 2020). In relation to this approach, other studies have empirically demonstrated that the happiness of the people who make up the workforce is determined by the factors mentioned above and the sectoral difference (Bright, 2008). This makes individuals feel more attracted to working in one sector than in another in today's digital society. In many cases, this decision is basically caused by intrinsic motivations or simply by the type of leadership or management style that these organizations carry out (Qing et al., 2020; Lee, 2016).

From the perspectives of positive psychology and happiness management employees happiness, in the era of Industry 4.0, is influenced by the salary, job stability and stress (Chirumbolo et al., 2020; Chitchai et al., 2018; Khosrojerdi et al., 2018; Johnston et al., 2013). In this fact many scientific studies of multidisciplinary nature have arisen to explore how salary influences on the employees happiness or subjective well-being. Song and Gao (2020), Ryu (2016) and other authors show that employees with low salary are not satisfied in their

jobs (Mangundjaya, & Mufidah, 2018). In this sense, some recent studies argue that this effect is more evident when workers do not have job stability and a decent salary (Thompson & Bruk-Lee, 2020; Origo & Pagani, 2009), This circumstance have a negative effect not only on their individual happiness but also on their quality of life and social relationships (Drobnič, et al., 2010).

In line with these studies, the literature shows that occupational stress is an important negative indicator of unhappiness (Udayar et al., 2020). Therefore, it is not surprising that people stressed in their work environment are less likely to achieve professional success, and have low levels of subjective well-being when they are working (Pan and Zhou, 2013). In this sense, organizations should undertake human resource management strategies in order to removed workers stress, not only for laboral health, but also because happier workers are more productive, innovative, creative, etc. (Yehya et al., 2020; Pecino et al., 2019; Oswald et al., 2015).

In accordance with the previous studies discussed in this section, and being aware that there is still much to be researched about these aspects in the public organizations context, especially in Spain (Núñez-Barriopedro et al, 2020), the following hypotheses are formulated:

H1: The type of organization directly and positively affects workers' happiness.

H2: Wages directly and positively affect the happiness of employees.

H3: Job stability directly and positively affects employees' happiness.

H4: Stress directly and negatively affects employees' happiness.

Research Methodology

For this academic work's methodological realization, an exploratory analysis has been carried out, of a correlational and inferential nature. The preliminary information has been extracted from the database offered by the study called "Citizens and the State (III)/Work Orientation (I)" which was carried out by the Centro de Investigaciones Sociológicas (CIS) of Spain, between April and June 2016 (CIS, 2018). The sample size is 1,834 people of both sexes. About the sampling procedure applied, it has been two-stage and stratified by clusters, with a selection of primary sampling units (municipalities) and secondary units (sections) at random and proportional, and of the later teams (individuals) by unexpected routes and sex and age quotas (Ahn & Mochón, 2010). Stratification has been formed by crossing the 17 autonomous communities and the two Spanish independent cities, with the size of the habitat divided into seven categories: less than or equal to 2,000 inhabitants; from 2,001 to 10,000; from 10,001 to 50,000; from 50,001 to 100,000; from 100,001 to 400,000; from 400,001 to 1,000,000, and more than 1,000,000 inhabitants. The sampling error for a 95.5% (two sigmas) confidence level, and $p = q$, the actual error is $\pm 2.3\%$ for the sample as a whole, and in the case of simple random sampling. Given the above, it is convenient to indicate, on the one hand, that the CIS survey was carried out by means of a

questionnaire that was developed in the homes of the people interviewed. This is the most common form used by large government research centers, precisely because it provides the most powerful communicative context to guarantee the quality of the information collected (French et al., 2014). On the other hand, this work took as a study of the salaried population that develops in Spain its professional activity in the Public Administration or the private company during the year 2016. As a result of this, the authors of the article consider the wage-earning population those individuals who have answered item P76B of the questionnaire: "Do you work the public administration, a public company, a private company? To measure the happiness or satisfaction dimension, item number P44 of the questionnaire was chosen, which states: "To what extent are you satisfied with your work", graduated using a Likert scale where value 1 means "totally satisfied" and weight 7 "totally dissatisfied". It should also be noted that the questionnaire provides a wealth of information on the characteristics of the jobs and how they are perceived by the people interviewed. Among them, and to complement the analysis, those related to salary, stability, and stress were taken, expressed through the questions below, and with values in a Likert scale, with five categories: from 1 (very agree) to 5 (very disagree):

"How much do you agree or disagree that your salary is high?" (P3302). This item, like all the questions below, answers a five-point Likert scale from 1 (strongly agree) to 5 (strongly disagree).

"To what extent do you agree or disagree that your employment is safe? (P3301).

"How much do you agree or disagree that your job is stressful?" (P3402).

Results

After cleaning data, the sample consists of 637 respondents. 143 of them work in the public sector and 494 work in the private one. 49.0% of them are men and 51.0% women. 29.0% are young (up to 35 years old), 59.3% are middle-aged (36 to 55), and 11.7% are elder (55 over). Firstly, and in terms of the degree of happiness in each sector, 69.3% of public workers are very or delighted, compared to 52% of the private sector workers. Chi-square test shows $\text{sig}=0.003$. Kolmogorov-Smirnov (K-S) and Shapiro-Wilk (S-W) tests show that the sector categories (P76B) have non-parametric distributions. Therefore, the contrast of the null hypothesis, concerning the possible association relation with P44, is measured by calculating the significance in Mann Whitney's U test, which turns out to be $\text{sig}=0.000$. Since the survey has many valid answers, t-Student test is also carried out, which gives $\text{sig}=0.000$ equally. Null hypothesis is rejected, and the association is confirmed. The averages are 2.15 in the public sector and 2.59 points in the private sector, confirming that public workers are more satisfied. Correlations of both, Spearman and Pearson, are positive, but weak (16.6% and 16.5%, respectively), with $\text{sig}=0.000$. In the second part, the possible association relations

between the worker's degree of satisfaction in each sector with certain working conditions are analyzed.

Happiness according to salary conformity:

In the salary conformity variable, we find that the 37.8% of the public sector respondents say they are very much or fully agreed with the salary received. The same is not true of private-sector employees, who represent 20.9%, i.e., 16.9 percentage points less than the group under analysis. The respective averages for both groups are 2.96 and 3.31. From this information, non-parametric contrasts of Spearman and Pearson were carried out, which reveal at 14.3% the existence of a positive association at a level of statistical significance less than 0.1% error. In the light of these data, Mann Whitney's U, as well as t-Student test, were carried out, both giving a significance of 0.000. Null hypothesis is, therefore, rejected.

When we study the relationships of the degree of wage compliance (P3302) with the variable P44 within each sector, we find that, in both industries, as it moves to greater wage disagreement, less satisfaction is obtained. In the public sector, 81.90% of people surveyed say they are from pleased to delighted with their salary. And on the other hand, 45.5% of public employees who say they are very much in disagreement with their salary are very or delighted in their professional activity. Differences are even more evident in the private sector, with these percentages being 85.8% and 31.1%, respectively. Averages of the degree of satisfaction with each option in P3302 are 1.73; 1.91; 2.17; 2.32; and 2.82 in the public sector. In the private context, the average satisfaction per category of this variable is 1.76; 2.27; 2.33; 2.82, and 3.53. It is verified that all the averages reached by the employees of private companies are somewhat higher than the obtained by the public group. Null hypotheses are rejected in both sectors. Categories that show statistical differences in their averages are shown in Table1.

Happiness according to conformity with safety at work:

In the job stability variable, 79.7% of the public sector respondents reported being very or totally safe in their jobs. This figure is slightly higher than that expressed by private employees, whose record is 64.8%. The average security perceived was 1.83 points for public employees and 2.37 points for remote employees. Spearman (21%) and Pearson (18.5%) tests show a positive correlation between security at work and happiness, at a level of statistical significance less than 0.1% error. Mann Whitney's U and t-Student tests give a sig=0.000, showing an association relationship between both of these variables. Within each sector, as with wages, when the degree of security offered by the job decreases, the level of happiness in the job decreases. In the public sector, 78.9% of those who agree very much with their security declare that they are very or totally satisfied, compared with 25.0% of those who disagree very much with security (Nosita, Pirzada, Lestari, & Cahyono, 2020). For their part, in the private sector, these rates are 64.7% and 28.5%, respectively. For each level of protection, the average degrees of satisfaction are 2.01; 2.11; 2.40; 2.60, and 2.75. In the private sphere, the averages of happiness for each security category are 2.36; 2.48; 2.56; 2.92, and 3.50, respectively. Once

again, all means for the private sector are higher than those for the public one. That is, in the private sector happiness is lower. Null hypothesis is rejected in both sectors, confirming a relationship of association between both variables.

Happiness according to conformity with the perception of the degree of stress:

In both sectors analyzed in this section, we find that the highest proportion of respondents stated that they “sometimes” feel the tension in the course of their work (category numbered 3 in variable P3402); precisely 37.1% (public) and 34.4% (private). In the public group, 38.5% of workers report having stress frequently or always, while in private employees, the rate rises to 44%. In P3402 the higher the number assessed, the lower the stress. The average for public employees is 2.76 and for private employees, 2.63. Therefore, it seems that public administration workers show a lower degree of stress at work than private employees. Spearman's (-4;8%) and Pearson's (-4.6%) tests reveal a negative and very weak correlation, both of which are not statistically significant. Mann Whitney's U test (sig=0.228), and t-Student test (sig=0.249), reveal the absence of an association between the sector and stress parameters. As the degree of stress felt decreases in both sectors, job satisfaction generally increases (except for the case of "Hardly ever" in public sector).

Among the public sector respondents, 56.0% of those who always feel stress say they are very to satisfied, and among those who say they never feel stress, 81.8% have that level of satisfaction. In the private sector, the respective percentages are 44.8% and 69.4%. In the public sector, each stress category's average satisfaction is 2.40; 2.10; 2.13; 2.13, and 1.82. In the private sector, the average degree of satisfaction for each stress option is 2.73; 2.83; 2.58; 2.21; 2.25. All these records are higher than those in the public sector. For public employees, null hypothesis must be maintained. However, in the group of private employees, it has to be rejected. There is an association between the level of felt stress and the degree of perceived happiness at work, at 0.1% error level.

Table 1. Association relationship satisfaction (happiness) to working factors

Factors	Measures	Public Sector	Private Sector
Salary (P3302)	Spearman	24.8%***	32.6%***
	Pearson	28.1%***	33.5%***
	<i>p</i> (K-W/ANOVA/Welch) ^a	0.001/ 0.016	0.000/ 0.000/ 0.000
Security (P3301)	Spearman/ Pearson	22.1%***	22.2%***
		22.4%***	23.4%***
	<i>p</i> (K-W/ANOVA/Welch)	0.008/ 0.112	0.000/ 0.000/ 0.000
Stress (P3402)	Spearman/ Pearson	-10.8% ^{††}	-15.9%***
		-12.3% [†]	-16.0%***
	<i>p</i> (K-W/ANOVA/Welch)	0.201/ 0.522	0.000/ 0.002/ 0.002
^{††} <i>p</i> < 0.30; [†] <i>p</i> < 0.20; * <i>p</i> < 0.05; ** <i>p</i> < 0.01; *** <i>p</i> < 0.001. a. When Levene test reveals non-similar variances, robustness tests are used (Welch and Forsythe tests).			

Given that the distributions are non-parametric for the three variables studied: salary, security and stress, the contrast of the respective null hypotheses is carried out using Kruskal-Wallis (K-W) test. However, due to the *Law of Large Numbers*, and given that the sample has hundreds of elements, distributions can be considered to behave as normal. For this reason, ANOVA contrast is also used. In the case in which Levene test confirms the non-similarity of the variances, Welch robustness test will be used (table 1). In those cases in which table 1 indicates statistical significance, whether it is more intense (error <0.1%) or with less force (error <5%), the appropriate post-hoc test is performed to show which are the categories of the variables whose means differ statistically.

In the public sector the statistical differences ($p < 5\%$) occur for: Strongly agree-Strongly disagree (desv= -2.412) and Agree-Strongly disagree (desv= -2.419). For the private sector measures are indicated in table 2 and figure 1.

Table 2. Pair comparisons. Private sector. Salary and Security (only comparisons with adjusted $p < 5\%$ are indicated)

Sample 1-Sample 2	Salary		Security	
	Statistic desv. Test	Adjusted p^a	Statistic desv. Test	Adjusted p^a
Strongly agree-Disagree	-4.428	0.000	-3.799	0.001
Strongly agree-Strongly disagree	-5.445	0.000	-4.195	0.000
Agree-Disagree	-3.754	0.002	-2.747	0.060
Agree-Strongly disagree	-4.943	0.000	-3.473	0.005
Neither agree nor disagree-Disagree	-4.266	0.000	-1.487	1.000
Neither agree nor disagree-Strongly disagree	-5.212	0.000	-2.601	0.093

a. Significance values have been adjusted using the Bonferroni correction for various tests.

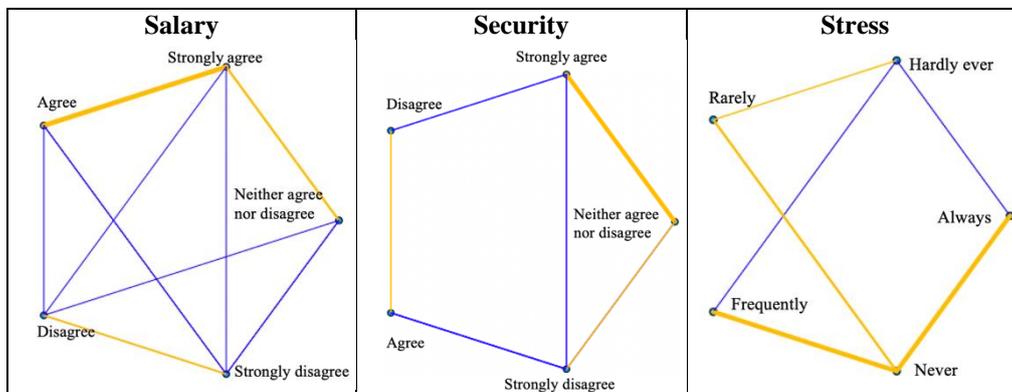


Figure 1: Pair comparisons (Salary, Security and Stress). Private sector.

For the Stress factor, the adjusted $p < 5\%$ occurs only in the couples: Hardly ever-Frequently ($p=0.007$; $desv=3.402$) and Hardly ever-Always ($p = 0.017$; $desv=3.146$).

Discussion

The statistical analysis elaborated here suggests that public employees are more satisfied with their professional performance than private sector employees in the era of Industry 4.0. Therefore, belonging to one sector or another influences employee satisfaction. Depending on the correlation level, this factor has a weight of approximately 17% in satisfaction variance and is significant at 0.1% error. As far as wages are concerned, almost 40% of public sector employees are significantly or very agree with the wages they receive, while in the private sector, this is not even 21%. Workers in both sectors agree that the greater the dissatisfaction with the salary received, the less general satisfaction they receive (Mousa et al., 2020; Pecino et al., 2019). It is most evident in the private sector, where, for each level of wages received, happiness is always lower than that achieved by public employees. The correlation between the private sector variables is around 33%, with an error at 0.1%. In other words, dissatisfaction with the salary received affects all employees, diminishing their overall satisfaction, but this effect is more pronounced in the private sector (Pirzada, Mustapha, & Alfán, 2016). In this sense, the most significant difference in satisfaction levels within the private sector is between those who strongly disagree and those who strongly agree with their salary (Saragih, Prasetio, 2020). The lowest is between those who disagree and those who agree. Nearly 80.0% of public employees said they were very or totally safe in their jobs. This rate was reduced by 15 percentage points in private employees. The employment stability variable is positively related to the happiness of any employee. It is more significant in the private sector (contrast tests indicate an error at 0.1%). The correlation is around 22.0%, with an error at 0.1%, in both sectors (Hernández-García de Velazco et al., 2020). Satisfaction or happiness is lower in private than in public workers for all levels of security. The most statistical difference in satisfaction levels within the private sector is between those who strongly disagree and strongly agree with their work safety (Chumaceiro-Hernández et al., 2020). The lowest is between those who strongly disagree and those who agree with their safety at work (Park, 2020; Thant & Chang, 2020). The remaining pairwise comparisons are not significant, with an error of less than 5%. About 40% of employees said they often feel stress in their jobs in both sectors, but this rate is below 40% in the public sector (38.5%) and higher in the private sector (44.0%) (Salas-Vallina et al., 2017). Contrast tests revealed no association between job satisfaction and perceived job stress in the public sector. The null hypothesis is rejected in the private sector because these tests show an association with an error level of less than 1%. However, statistically, significant differences are only

between those who frequently feel stress at work and those who hardly ever touch it, and those who always feel stress and those between who hardly ever feel stressed.

Therefore, hypotheses H1, H2, and H3 are accepted, and hypothesis H4 is rejected for the public sector and only partially accepted for the private sector.

Conclusions

Results referred above are supported by theoretical framework. It is not difficult to find abundant literature on the well-being and job satisfaction of public employees in the era of Industry 4.0. In particular, one line of research on this issue has focused, on the one hand, on empirically assessing whether working in public administration or private enterprise has a direct influence on the level of happiness of this particular workforce. And on the other hand, to find out which are the socio-demographic, psychological, and managerial factors which have a positive impact on the job satisfaction of people who carry out their professional activity in public organizations in the digital society. This work is not without its limitations. Firstly, the data covered in this academic work are based on a secondary source of information. This means that some aspects associated with this study do not appear in the questionnaire. Secondly, this article, of an exploratory nature, was born to be one of the first bibliographical productions, which quantitatively explores the happiness of Spanish public employees. Under this approach, this work may encourage future specialists in the economics of happiness to continue studying this particular topic of Happiness Management in greater depth. Thirdly, it should be noted that one of the limitations of this work is its temporal transversality. Therefore, it was advisable to carry out an exhaustive analysis of the sample to enjoy a clearer picture of Spanish public employees' job satisfaction and their comparison with private employees. Finally, it would be interesting to transfer this type of study to other countries to increase the robustness of our statistical analysis and its conclusions. It should be borne in mind that the outbreak of the SARS-Cov2 coronavirus has come into our lives to teach us that citizens' collective happiness will come mainly from the quality of the services offered by public administrations (health, education, etc.). It requires that their human capital understands that their job satisfaction contributes to cultivating strong social welfare networks that can cushion the economic collapse brought about by this terrible pandemic. This academic debate will be welcome as long as we know that we need more data and numerical analysis on this little known academic issue of the Economics of Happiness.

Limitations and Future Directions

This study has some limitations. First of all, it was published in 2018, so it seems that it would be useful to study whether there has been an evolution of thinking about climate change in recent years. Secondly, it refers only to Spain, so it would

be interesting to analyze the same items in other countries, whether within the European Union or in third countries, and check the degree of similarity or difference between the perceptions of the citizens (Pecino et al., 2019; Linz and Semykina, 2012).

The literature consulted for the development of this research reveals the scarcity of bibliographic productions that quantitatively analyze public employees' happiness, especially in Spain, an economy characterized by high youth unemployment levels (Núñez-Barriopedro et al., 2020). To better understand this scientific casuistry, it is appropriate to undertake more research approaches. Its results may be of great use in the future for the implementation of public policies aimed at significantly promoting the subjective well-being of citizens under the happiness management approach (Ravina-Ripoll et al., 2019) or to carry this management concept to private companies in order to increase the motivation of their employees (Foncubierta-Rodríguez & Sánchez-Montero, 2019).

This research approach highlights the need to continue developing future scientific studies that allow further understanding of the psychological and organizational factors that make public employees happier than private employees (Brauner et al., 2020). A large number of the articles published in recent decades reveal the existence of a direct association between the variables: commitment, organizational climate, and salary with the happiness parameter in the public sector in the era of Industry 4.0 (Meynhardt et al., 2020; Park et al., 2020; Salas-Vallina et al., 2017). One of the elements that explain this phenomenon is that the public sector's job security conditions significantly satisfy its human capital's subjective well-being, and therefore, lower levels of stress.

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CZY PRACOWNIKÓW PUBLICZNYCH W HISZPANII ZADOWAŁA PRACA W ERZE PRZEMYSŁU 4.0?

Streszczenie: Liczne badania w literaturze wskazują na związek między czynnikami społeczno-psychologicznymi w pracy a stopniem satysfakcji lub postrzeganego szczęścia. Jednak nadal istnieje niewiele analiz, które wyraźnie odnoszą się do tej relacji w przypadku pracowników sektora publicznego w porównaniu z pracownikami sektora prywatnego. Celem tego artykułu jest ustalenie, czy pracownicy sektora publicznego są szczęśliwsi niż sektor prywatny, łącząc szczęście z niektórymi z tych czynników w Hiszpanii. Wyniki pokazują, że pracownicy sektora publicznego są rzeczywiście szczęśliwsi niż ci w sektorze prywatnym. Jeśli chodzi o płace, bezpieczeństwo i odczuwany poziom stresu, istnieją powiązania ze szczęściem pracowników. Badanie to dostarcza bardzo przydatnych informacji dla menedżerów firm, którzy są odpowiedzialni za politykę kadrową związaną z tymi czynnikami: wynagrodzeniem, bezpieczeństwem i stresem.

Słowa kluczowe: szczęście, satysfakcja, zasoby ludzkie, polityka kadrowa, Przemysł 4.0, sektor publiczny, sektor prywatny.

西班牙公众员工在工业4.0时代的工作绩效是否更高？

摘要: 文献中的一些研究表明，工作中的社会心理因素与满意度或感知的幸福感之间存在联系。但是，与私营部门相比，很少有分析能够明确解决这种关系。本文旨在通过将幸福与西班牙的某些因素相关联，找出公共部门雇员是否比私营部门更快乐。结果表明，公共部门的雇员确实比私人部门的雇员快乐。在薪酬，安全性和可感知的压力水平方面，与员工幸福感之间存在关联关系。这项研究为那些负责与以下因素相关的人力资源政策的公司经理提供了非常有用的信息：工资，安全性和压力。

关键字: 幸福，满意度，人力资源，人力资源政策，工业4.0，公共部门，私营部门。