



A manufacturing-oriented model for evaluating the satisfaction of workers – Evidence from Turkey



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ABSTRACT

Job satisfaction, in terms of worker's satisfaction, is one of the intensively studied areas in human resource and management. However, there is little information available on how ergonomics and the manufacturing environment affect job satisfaction. This study analyzes the extent of the relationship between job satisfaction and work and workplace related conditions. A conceptual model is proposed to evaluate job satisfaction that considers 34 elements in four categories: manufacturing systems, facility design, safety and ergonomics, and human resources and management. A survey of 169 blue-collar workers working in the automotive industry was conducted to investigate the applicability of the model. A comprehensive exploratory factor analysis was used to determine inter-related elements, their underlying factors and their effects on job satisfaction. The analysis revealed 6 factors with 18 related elements. From a multi linear regression analysis, we develop a job satisfaction model built on factors of human resource policies, safety, ergonomics, air quality, thermal comfort and disturbing equipment. The results reveal that ergonomics plays the most important role in workers' satisfaction for the respondent Turkish automotive workers. In contrast, human resource policies seem not play a critical role in job satisfaction because of higher standards in automotive industry compared to other industries in Turkey.

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1. Introduction

Job satisfaction is described as a person's overall effective reaction to the set of work and work-related elements (Cranny et al., 1992). Because job satisfaction is one of the determinants of employee turnover (Mobley et al., 1979; Griffeth et al., 2000), it has been of interest for decades to industrial managers and researchers. Employee turnover is a problem for companies not only because they incur high costs (replacement, hiring, training costs, etc.) but also because of loss of institutional knowledge. Nowadays, companies are also dealing with the high costs of turnover of Gen-Y workers because, it is claimed, 70% of them quit their first job within two years of joining the organization (Schawbel, 2011). Several previous studies have also demonstrated a negative correlation between job satisfaction and intention to quit the job

(MacIntosh and Doherty, 2010; Egan et al., 2004). Thus, job satisfaction, in the context of employee retention and turnover, is important for companies aiming to gain a competitive advantage in the market.

Various factors affect job satisfaction. The main factors considered in the literature are psychological, human resources, physical workplace and physical risk. Because psychological factors are hard to analyze, requiring specialist psychological knowledge and research methods, they are not considered within the scope of this study.

Human resources and management policies are an extensively studied field in job satisfaction. Many job satisfaction elements related to such policies have been defined, analyzed and classified since early studies. Smith et al. (1969) was a pioneering study focusing on job satisfaction elements related to human resource policies. The authors introduced the Job Descriptive Index (JDI) to develop a structure for job satisfaction evaluation. This index consists of five scales related to worker satisfaction, such as work, pay, promotion, co-workers and supervision. Sims et al. (1976) developed a six-dimensional model of variety, autonomy, feedback, dealing with others, task identity and friendship opportunities.

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Røssberg et al., (2004) introduced the ten-item working environment scale (WES-10), including workload, conflict, self-realization and nervousness, and investigated the relationship of WES-10 scores with job satisfaction.

Other key elements related to human resource management are job complexity and pay (Gerhart, 1987), regular payment (Bilgiç, 1998), teamwork and supervisor support (Griffin et al., 2001), job specificity, routineness, feedback, and human resource development (Wright and Davis, 2003), flexible workplace practices (Bauer, 2004), pay, continuing education, professional growth and work environment (Randolph, 2004), payment, supervision, promotion, working hours and co-workership (Abdullah et al., 2007).

Job satisfaction is related to elements concerning the physical work place and physical risk, such as physical conditions or availability of tools, equipment and furnishings. Cleanliness of the workplace, the condition and availability of furnishings and office equipment, basic facilities and even the color of the work place are a few examples of this category. Physical risk elements include all potential factors related to occupational health and safety, and ergonomics. The most commonly studied elements in these two categories are listed in Table 1. The effects of the elements in Table 1 on job satisfaction are discussed briefly below.

Dawal and Taha (2006) surveyed automotive industry workers to investigate the effects of several environmental factors and job characteristics on job satisfaction, such as skill variety, autonomy and feedback. They concluded that there is a positive correlation between job satisfaction and environmental factors. Abdullah et al. (2007) conducted factor and regression analyses to determine the significance of the relationship between work environment elements and job satisfaction, finding that cleanliness, communication, use of equipment and basic facilities each have a significant impact on job satisfaction. Lee and Guerin (2009) introduced seven indoor environment quality (IEQ) criteria in relation to job satisfaction and work performance. They found that, while furnishing quality has a significant impact on job satisfaction and work performance, indoor air quality only affects work performance. Similarly, Newsham et al. (2009) explored the relationship between environmental elements and job satisfaction, finding that lighting has a major impact on job satisfaction. Ardakani et al. (2013) presented a strong relationship between job satisfaction and physical conditions in a manufacturing industry while Fairbrother and Warn (2003) reported that the physical aspects of workplace did not

predict job satisfaction in a navy warship.

Ergonomics, human factors and physical risk elements have been found to affect labor performance, labor productivity and worker satisfaction (Shikdar and Sawaqued, 2003). A lack of ergonomic and safety principles are two main sources of risks in a manufacturing environment that may cause injuries, emotional or physical stress, reduced motivation and dissatisfaction, and low productivity (<http://www.sciencedirect.com/science/article/pii/S0360835203000743> Ayoub, 1990a, 1990b <http://www.sciencedirect.com/science/article/pii/S0360835203000743>). The 5th European Working Conditions Survey classified physical risks as vibrations, noise, high temperatures, low temperatures, dust, chemical substances, tiring or painful positions, heavy loads, and repetitive hand or arm movements (Eurofound, 2012). Kittusamy and Buchholz (2004) also concluded that whole body-vibration and non-neutral body postures are two important risk elements for operating engineers. From examining the relationship between physical work environment and long-term sickness absence among Danish employees, Lund et al. (2006) reported that uncomfortable working positions, lifting or carrying loads, and pushing or pulling loads increase the risk of long-term sickness absence among both female and male employees. For female employees, the negative effects of poor physical work conditions increase as psychosocial work conditions get worse. Kahya (2007) also found that poor workplace conditions, such as physical effort, environmental conditions and hazards, had a negative impact on employee performance.

From an in-depth analysis of previous research, this study develops a comprehensive list of job satisfaction elements, aiming to present a holistic view of the job satisfaction problem in contrast to the literature, in which most studies focused only on a few major aspects. As well as considering many previously emphasized job satisfaction elements, we introduce additional elements focusing on ergonomics, safety and manufacturing environment, which have been ignored in previous studies. We aim to offer insights to industry by explaining the importance of the relationships between these elements and job satisfaction. We especially emphasize ergonomics and safety in our analysis because Eurofound (2012) revealed that European workers have seen no reduction in their levels of exposure to physical risks since 1991. Indeed, levels of “tiring and painful positions” and “repetitive hand or arm movements” risks have increased. According to these survey results,

Table 1
Comprehensive list of job satisfaction elements.

Environmental job satisfaction elements	Author(s)
Basic facilities: toilet/restroom, canteen, prayer room, daycare, parking, etc.	Martel and Dupuis (2006), Abdullah et al. (2007)
Equipment usage/ergonomics/posture	Abdullah et al. (2007); Martel and Dupuis (2006); Synwoldt and Gellerstedt (2003); Kittusamy and Buchholz (2004); Lund et al. (2006); Marras et al. (2000)
Physical effort and risk factors (lifting, pushing, pulling, bending, etc.)	Kahya (2007); Lund et al. (2006); Marras et al. (2000)
Dust	Kahya (2007); Shikdar and Sawaqued (2003)
Heat/temperature/thermal comfort	Kahya (2007); Dawal and Taha (2006); Shikdar and Sawaqued (2003); Lee and Guerin (2009); Turcotte (1988)
Noise	Abdullah et al. (2007); Kahya (2007); Dawal and Taha (2006); Shikdar and Sawaqued (2003); Martel and Dupuis (2006); Synwoldt and Gellerstedt (2003); Turcotte (1988)
Smell	Kahya (2007)
Light	Kahya (2007); Dawal and Taha (2006); Shikdar and Sawaqued (2003); Martel and Dupuis (2006); Synwoldt and Gellerstedt (2003); Lee and Guerin (2009); Newsham et al. (2009); Turcotte (1988)
Humidity	Kahya (2007); Dawal and Taha (2006); Turcotte (1988)
Air quality/ventilation	Abdullah et al. (2007); Lee and Guerin (2009); Newsham et al. (2009)
Maintenance	Lee and Guerin (2009)
Vibration	Synwoldt and Gellerstedt (2003); Kittusamy and Buchholz (2004); Turcotte (1988)
Acoustics	Lee and Guerin (2009); Newsham et al. (2009)
Cleanliness	Abdullah et al. (2007); Lee and Guerin (2009); Martel and Dupuis (2006)
Office furnishings	Lee and Guerin (2009); Carlopio and Gardner (1992); Newsham et al. (2009); Synwoldt and Gellerstedt (2003)
Office layout	Lee and Guerin (2009)

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