Chapter 48

The Contribution of Neuroscience and Health Psychology to Macroergonomics:
Focusing on Workers as Active Agents

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ABSTRACT

When a work system is considered we must focus on people that are part of the system as an active agent that can participate and interact all along the working process. In this process, stress contributes to increasing the probability of diseases and accidents. Therefore, one of the main objectives, from a preventive perspective, is to reduce stress levels. Related to this, the characteristics of healthy organizations will be described as a model to promote health. The objective of this chapter is to offer a broad and multidisciplinary perspective of prevention risk in the workplace centered in the worker, taking the view of neuroscience and health psychology. For that purpose, stress interventions in the organizations and in the individuals will be outlined. Finally, this chapter would finish proposing a preventive intervention to improve healthier work environments, taking into account neurosciences and health psychology. This proposal will be based on improving lifestyle, education for health, and self-respect.

John Henry he hammered in the mountains
His hammer was striking fire
But he worked so hard;
it broke his heart
John Henry laid down his hammer
and died, Lord, Lord
John Henry (trad. Adapted by Pete Seeger)

GENERAL PERSPECTIVE

John Henry is a traditional character from the history of the United States of America that represents the fight between the man and the machine. The man, John Henry, fighting against the machine to prove that men can defeat the machine; at the end, John Henry wins but finally, due to the great effort, dies. From a humanistic point of view, the need to be superior to the machine is a good view to preserve the supremacy of men in front of the machines; but, this "romantic" view finishes with John Henry's dead. Is it worth it? It is worthwhile dying to demonstrate that one can be better in his job? Is it worthwhile dying/getting sick for a job? That's the point. Fatal injuries related to work are usual and it is necessary to take actions to reduce these fatal consequences.

Considering that macroergonomics is a subdiscipline of Ergonomics which is concerned with the analysis, design, and evaluation of work systems, it is necessary to consider that a new vision of work systems, analyses and evaluation should be done within a wide perspective, trying to avoid mistakes and difficulties from the "classic ergonomics". Recently, Thatcher, Waterson, Todd and Moray (2017) have asserted that "ergonomics should move beyond a Westernised view of worker-organization-technology fit, taking a multidisciplinary approach which engages with other social and biological sciences". From neuroscience, when a work system is considered researchers must focus on people that are part of the system, but not as a mere "mechanical and passive elements" but as an active agent that can participate and interact all along the working process. In this sense, when the authors of this chapter talk about healthy workplaces, they refer to these people that participate of an interactive system. Moreover, every day is increasingly the necessity of person-to-person interaction to increase productivity, due to an important part of the jobs are based on social relationships. Therefore, workers should be the focus to have healthy workplaces. Thus, from a macroergonomic perspective, environmental elements have been related to psychological characteristics and performance (Realyvásquez, Maldonado-Macías, García-Alcaraz, Cortés-Robles & Blanco-Fernández, 2016). Therefore, a new perspective seems necessary to have a more comprenhensive vision of sociotechnical systems and its relation to performance and health.

The main aim of Ergonomics is to find the harmony between efficiency and workers' well-being (health, security and satisfaction) by means of changing or improving working conditions. Considering that Ergonomics is a multidisciplinary discipline that gathers from other disciplines to address more efficiently the problems in workplace, it is surprising that despite taking knowledge from other disciplines there is a lack of addressing more comprehensive of psychosocial factors, especially stress (Serrano & Costa, 2018). Thus, it is considered that broaden the ergonomic perspective would help to cope with workplace issues. Therefore, a prospective view should be defended, not to beat the classical ergonomic perspective, but to contribute with a modern perspective gathering updated knowledge from the world of biopsychosocial sciences. It is well known that scientific knowledge and organizational practices are

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