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## The relationship between working conditions and musculoskeletal / ergonomic disorders in a manufacturing facility – a longitudinal research study

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### Abstract

This research investigates the relationship between working conditions and musculoskeletal / ergonomic disorders in a manufacturing facility. I believe that the biomechanical and psychosocial aspects of work have a significant influence on the individual worker's health and well-being. The work organization at which I have evaluated the employee's health and well-being and collected a large amount of data was at a large manufacturing facility. This research is based upon the Balance Theory Model of Smith & Carayon-Sainfort [1, 2]. The overall purpose of this research study was to identify the stressful working conditions and control them. The overall aim of this research is to improve the long term health and well-being of workers in a manufacturing facility.

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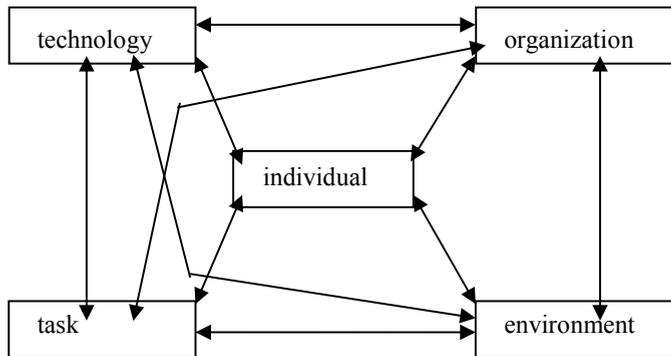


Fig. 1. The Balance Theory Model of Smith & Carayon-Sainfort [1, 2].

## 1. Introduction

I have done research on the relationship between working conditions and musculoskeletal disorders in a manufacturing assembly facility. I believe that the physical and psychosocial aspects of work have a significant influence on the individual worker's health and well-being. The work organization at which I evaluated the employee's health and well-being was at a large manufacturing assembly facility. This research is based upon the Balance Theory Model of Smith & Carayon-Sainfort [1, 2]. This model specifies that the working conditions and other factors outside of work, can create a stress on the individual. This stress can have physiological and psychological consequences. If the stress exceeds the individual's capacity, the stress can produce a negative effect on the individual which could result in a strain. This is a bad fit between the individual resources and the work demands. If the stressful exposure continues for a prolonged time period, then this can result in serious musculoskeletal disorders.

The Balance Theory Model of Smith & Carayon-Sainfort [1, 2] is as follows (see Figure 1).

The Balance Theory Model is a system view concept for the various elements of work. The Balance Theory Model shows the stress that working conditions can exert on the individual. These five elements of the Balance Theory Model all interact to define how work will be performed. The individual is in the center of the Balance Theory Model. The individual has physical attributes and characteristics, previous experiences and knowledge, individual attitude and personality, and learned behaviors from which to draw from in order to cope with the working condition stress. The elements of task, technology, organization, and environment all influence the job content of work, the physical effort required of the individual, and the level of stress placed upon the individual [1].

The overall purpose of my research is to try to identify the stressful working condition and attempt to control them. Therefore the purpose of an intervention is to try to control the various musculoskeletal disorders in the work environment. By trying to control the various musculoskeletal disorders in the work environment, you should also attempt to reduce or eliminate the level of stress, and to try to reduce or eliminate the level of strain. There are a wide variety of things that can be attempted in the work environment in order to try to reduce or eliminate the existence of musculoskeletal disorders. These include engineering redesign, work method changes, administrative control, worker training, work hardening, and management organizational work rules to reduce exposures [3].

## 2. The research questions

Based on my objective to do research on the relationship over time between working conditions and musculoskeletal disorders in a manufacturing assembly facility, the following research hypotheses were explored:

- H1: Self reports of physical aspects of work influence worker's musculoskeletal pain or discomfort. It is anticipated that the relationship will be stable over time.

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