

## FACTORS AFFECTING JOB SATISFACTION IN TWO AUTOMOTIVE INDUSTRIES IN MALAYSIA

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**Abstract.** A survey was conducted to investigate the relationship between job satisfaction, job characteristics and environmental factors that affect work design in two automotive manufacturing companies in Malaysia. The aim of the study is to determine the factors that influence employees' perception towards their work. 170 male subjects between the ages of 18 to 40 years with the mean age of 26.8 and standard deviation (SD) of 5.3 years and mean work experience of 6.5 and SD of 4.9 years were involved. A set of multiple choice questionnaire was developed and data was collected by interviewing the employees at the production plants. The survey focused on job satisfaction, job characteristics and environmental factors. The results showed that job characteristics and environmental factors were significantly related to job satisfaction.

*Keywords:* Job satisfaction, job characteristic factors, environmental factors, work design, automotive industry

**Abstrak.** Satu tinjauan telah dijalankan untuk menyiasat perhubungan di antara kepuasan kerja, ciri-ciri tugas dan faktor suasana yang mempengaruhi reka bentuk kerja di dua buah syarikat pembuatan automotif di Malaysia. Matlamat utama kajian adalah untuk menentukan faktor-faktor yang mempengaruhi persepsi pekerja terhadap tugas mereka. 170 orang subjek lelaki berumur di antara 18 tahun hingga 40 tahun dengan purata umur 26.8 tahun dengan sisihan piawai (SP) 5.3 tahun dan purata pengalaman kerja 6.5 tahun dengan SP 4.9 tahun telah mengambil bahagian. Satu set soalan pelbagai pilihan telah dihasilkan dan maklumat dikumpulkan dengan cara menemuduga pekerja di kilang pengeluaran tersebut. Hasil tinjauan menyokong kajian dengan menunjukkan bahawa ciri-ciri tugas dan faktor-faktor suasana mempunyai hubungan yang signifikan dengan kepuasan kerja.

*Kata kunci:* Kepuasan kerja, ciri-ciri tugas, faktor-faktor suasana, reka bentuk kerja, industri automotif

### 1.0 INTRODUCTION

The concept of job satisfaction is defined as an individual's attitude about work roles and the relationship to worker motivation [1]. There could be no job satisfaction where there is no motivation [2]. The job satisfaction and job dissatisfaction theory of Herzberg, Mausner and Synderman [3] distinguished two separate groups of

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factors influencing individual job satisfaction and dissatisfaction. The first group called “motivators” that led to job satisfaction and the second group called “hygiene” led to job dissatisfaction.

The most important evidence that indicated the worsening conditions of an organization is the low rate of job satisfaction [2]. Thus job satisfaction is the key to establishing a healthy organizational environment in an organization. Nonetheless, factors related to job satisfaction are relevant in the prevention of employee frustration and low job satisfaction because employee would work harder and perform better if they are satisfied with their jobs [4–11]. Environmental factor is considered as one of the factors that could affect job satisfaction [12].

Although there have been numerous studies on the effects of environmental factors on human performance and satisfaction, findings were often specific to the particular investigation and to date mainly concern with the individual components of the physical environment [13]. With regards to the problem, this study aims to discover new insight into the important issues of job satisfaction in automotive industry in Malaysia as an integral part of ergonomics investigation. The primary objective of this research is to investigate the relationship between job satisfaction, job characteristics and environmental factors that affect work design. This is due to the fact that automotive industries are considered as one of the biggest contributor in developing Malaysian economics growth. The methodology is developed to address the objective that includes questionnaire survey, observation, measurements, data collection and statistical analysis.

## 2.0 METHODOLOGY

The job diagnostic survey (JDS) developed by Hackman and Oldham [14] was used as a tool to diagnose the characteristic of the job and environmental factors in the survey. The JDS was translated to Malay language to suit the Malaysian population. The questionnaires consisted of a set of Likert-type scales multiple-choice items [15]. To identify the relationship between job satisfaction, job characteristics and environmental factors, the data were analyzed using statistical methods to determine the means and correlations.

### 2.1 The Survey

The questionnaires were distributed to the subjects individually. Two automotive manufacturing industries were involved in the survey, which will be called Auto 1 and Auto 2 respectively. 170 male subjects between the ages of 18 to 40 years took part in the survey.

## 2.2 The Questionnaires

Basically, the questionnaires were designed in three sequential sections, covering:

- (i) General background data i.e. age, gender, years of employment, marital status and education levels.
- (ii) Job characteristics factors i.e. skill variety, task identity, task significance, autonomy and feedback from the work.
- (iii) Environmental factors i.e. air temperature, humidity, noise and light.

The five job characteristics factors were tested and defined according to Hackman and Oldham [14] studies as the following;

### 2.2.1 Skill Variety

The degree to which a job requires a variety of different activities in carrying out the work, which involves the use of a number of different skills and talent of the employee.

### 2.2.2 Task Identity

The degree to which a job requires completion of a “whole” and identifiable piece of work i.e. doing a job from beginning to end with a visible outcome.

### 2.2.3 Task Significance

The degree to which a job has a substantial impact on the life or work of other people whether in the immediate organization or in the external environment.

### 2.2.4 Autonomy

The degree to which a job provides substantial freedom, independence and discretion of the employee in scheduling work and in determining procedures to be used in executing a particular job.

### 2.2.5 Feedback from Job

The degree to which carrying out the work activities required by the job results in the employee obtaining direct and clear information about the effectiveness of his or her performance.

Four environmental factors were also tested and defined as follows:

(i) Air temperature and humidity

An important consideration on the effects of thermal environment is psychological parameters such as level of arousal and motivation as well as other factors that contribute to individual differences [13]. The questionnaire developed on thermal comfort (temperature and humidity) adopts the ASHRAE [16] definitions as “the condition of mind which expresses satisfaction with the thermal environment”. The reference to “mind” indicates that it is essentially a subjective term. On the other hand, warmth discomfort has been shown to be related to the stickiness caused by un-evaporated sweat; for example trapped in clothing [13]. As a result, the enquiries on thermal comfort include satisfaction or comfort and discomfort on the condition explained above by ASHRAE [16] and Parson [13]. In addition, thermal environment measurements i.e. work place temperature and relative humidity were taken at each workstation.

(ii) Noise and light

The term comfort is not usually used when assessing the effect of noise on the occupants of the buildings. In practice, annoyance levels are the most useful criterion [13]. In this study, noise level was measured throughout the workstations and the average was taken using dB(A) values. Therefore, enquiries on noise include annoyance or comfort or discomfort on work place condition. Light can cause discomfort to the occupants of an environment as well as positive sensations such as pleasure and emotional sensations [13]. Enquiries on illuminant include satisfaction or comfort and discomfort to see the task during work. Illuminant was measured throughout the workstations in Lux.

## 2.3 The Analysis

The data were analyzed for correlations using Spearman’s rank order correlation technique. Reliability tests were obtained for all factors tested in the survey using Cronbach’s  $\alpha$  in order to test the reliability of the questions in the survey.

## 3.0 RESULTS

The results are divided into several sections, covering:

- (i) General background data
- (ii) Job characteristics and job satisfaction factors
- (iii) Environmental factors
- (iv) Reliability measures
- (v) Correlations of job satisfaction with job characteristics and environmental factors

### 3.1 General Background Data

Of the 170 male participants interviewed, 80% held SPM certificate (equivalent to “O” levels) in both companies while others held SPM certificate with other skill certificates. 69% of participants in Auto 1 were married and 31% were single. On the other hand, 87% of the participants in Auto 2 were single and 13% were married. The subjects were between the ages of 18 to 40 years with the mean age of 26.8 and SD of 5.3 years and mean work experience of 6.5 and SD of 4.9 years.

The age factor is normally distributed but work experience is not. Work experience for Auto 1 is negatively skewed while work experience for Auto 2 is positively skewed. The responses indicated that 85% of the workers in Auto 1 are 26 years and above while 90% of the workers in Auto 2 are below 26 years. Only 15% of workers in Auto 1 are 25 years and below while 10% of the workers in Auto 2 are 26 years and above.

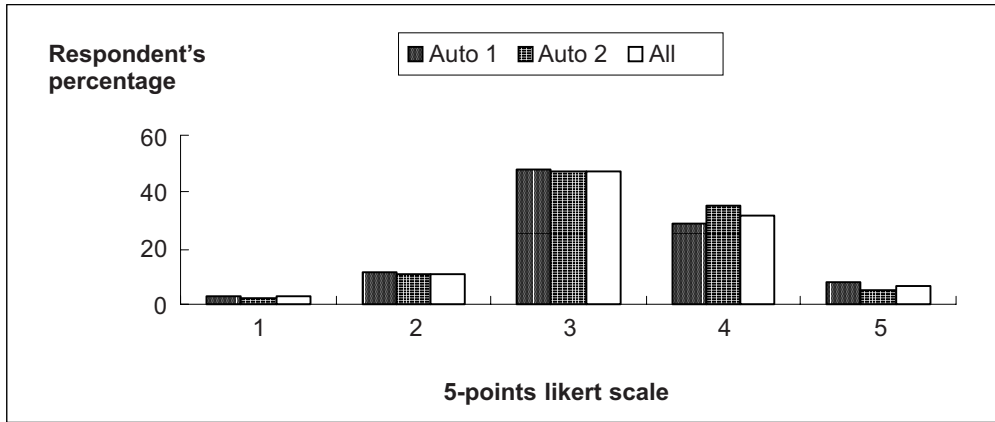
**Table 1** Relationship between respondents’ percentage and workers age

Age (Years)	Respondents’ percentage	
	Auto 1	Auto 2
18 – 20	3	21
21 – 25	14	70
26 – 30	50	9
31 – 35	26	0
36 – 40	7	0

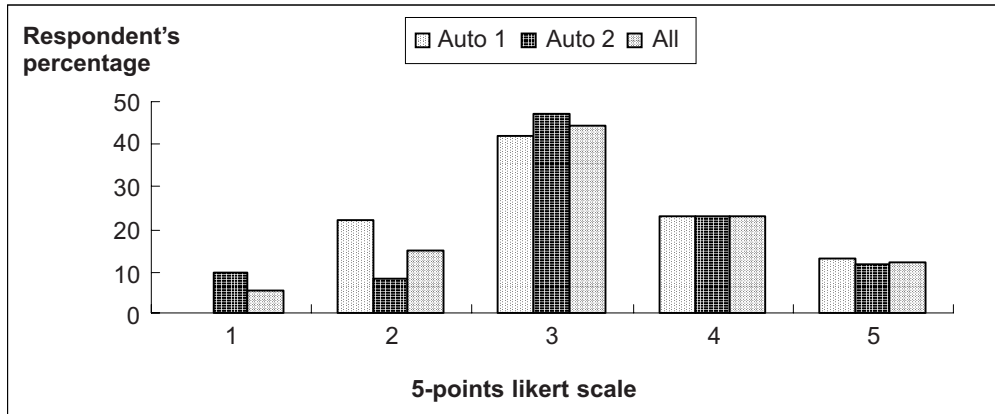
**Table 2** Relationship between respondents’ percentage and work experience

Work experience (Years)	Respondents’ percentage	
	Auto 1	Auto 2
1 – 2	5	48
3 – 4	3	42
5 – 6	20	4
7 – 8	44	6
9 & above	26	0

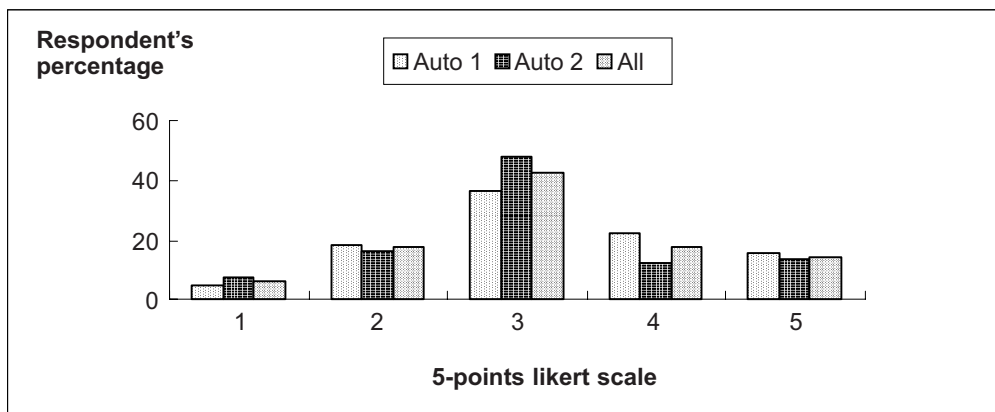
As for work experience, 85% of the workers in Auto 1 have work experience of more than five years. Another 15% have work experience of less than five years. Conversely, 90% of the workers in Auto 2 have work experience of 4 years and below. Only 10% have work experience of between five to eight years. Respondents in Auto 2 were younger and less experienced than respondents in Auto 1. The relationship between respondents’ percentage, workers age and work experience are shown in Tables 1 and 2 respectively.



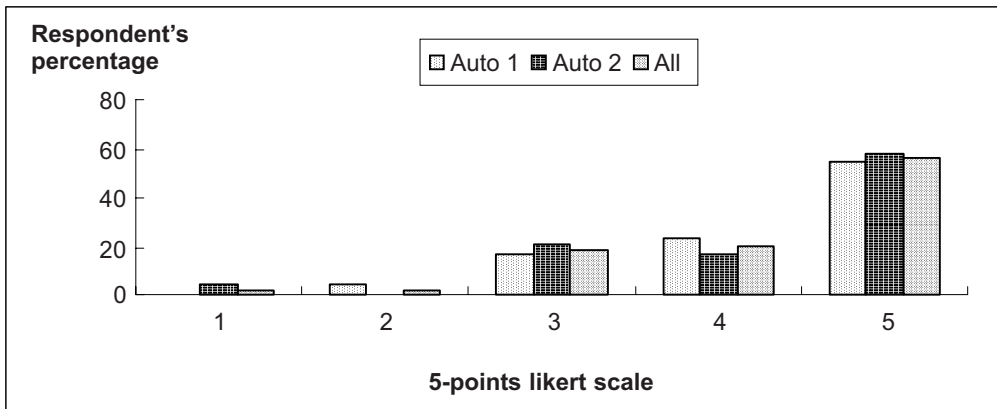
**Figure 1** Job satisfaction factor



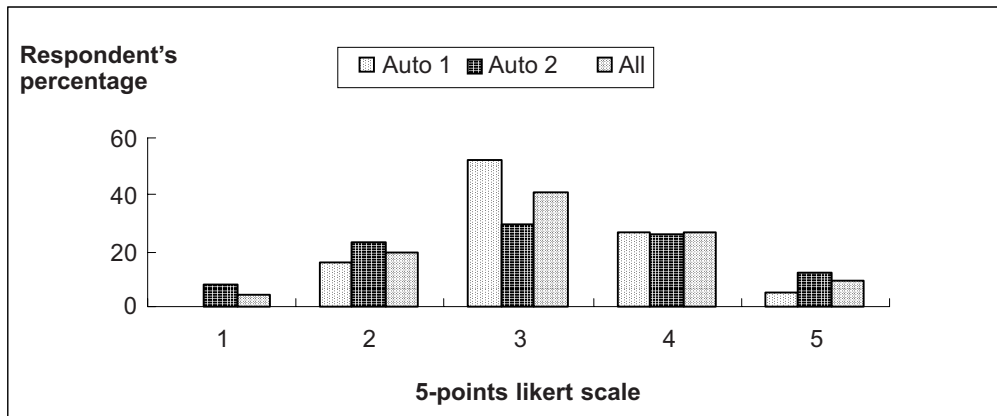
**Figure 2** Skill variety factor



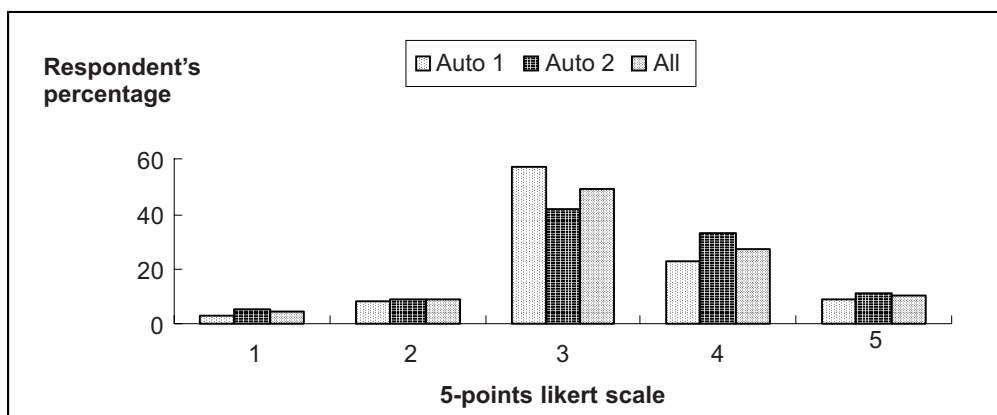
**Figure 3** Task identity factor



**Figure 4** Task significance factor



**Figure 5** Autonomy factor



**Figure 6** Feedback factor

### 3.2 Factors for Job Characteristics and Satisfaction

The summary of the responses for job satisfaction and job factors in these two companies are illustrated in Figures 1 to 6. Most factors are normally distributed except for task significance, which is negatively skewed. The five-point Likert-type scale ranged from 1 = very little, through 3 = moderate, and to 5 = very much, are presented in each figure.

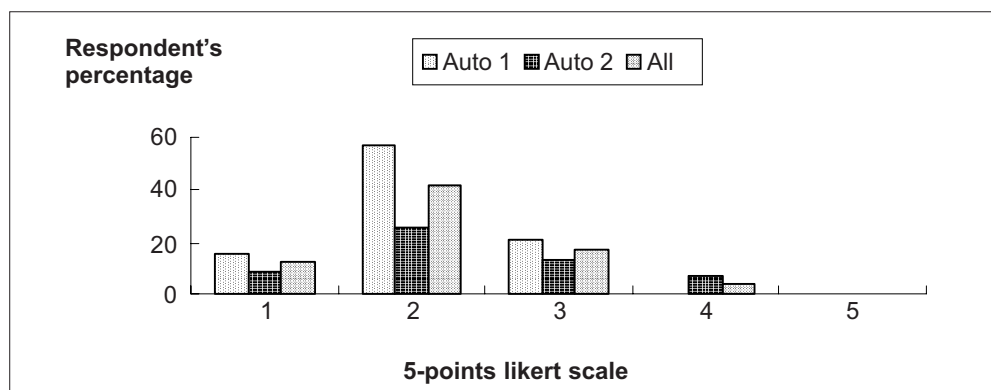
Obviously, respondents from both companies reported maximum score at moderate level of Likert-type scale for job satisfaction, skill variety, task identity, autonomy and feedback factors. On the other hand, only the task significance factor shows maximum score at high level of Likert-type scale for both companies.

### 3.3 Environmental Factors

Responses for the environmental factors are shown in Figures 7 to 10 respectively. Normality plots were examined and it was noted that most factors are normally distributed.

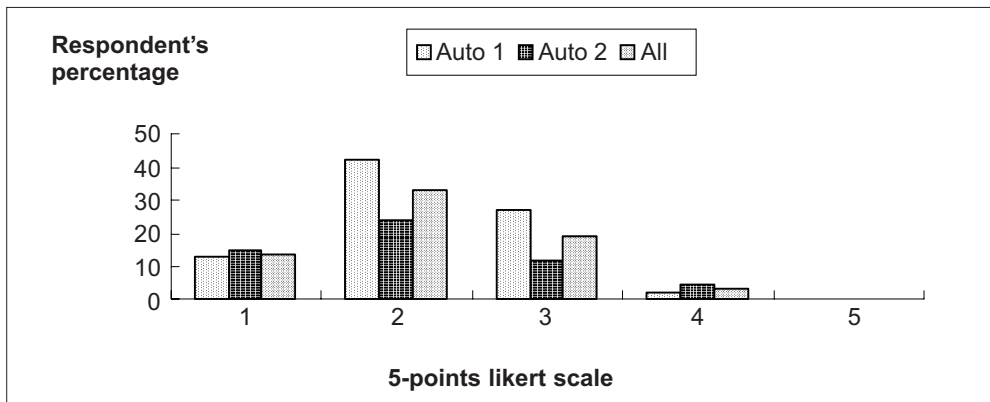
The five-point Likert-type scale ranged from 1 = very discomfort through 3 = moderate comfort, and to 5 = very comfortable, are presented in each figure. It can be seen that more than 50% of respondents from both companies have chosen a Likert-scale 2 for temperature, humidity and noise. As for light factor, more than 50% of the respondents from Auto 1 have chosen a Likert-scale 3 while more than 40% of the respondents from Auto 2 have chosen a Likert-scale 4.

The average value for lighting in Auto 1 is 567 lux while an average of 540 lux is observed in Auto 2. Relative humidity is higher in Auto 1 (69.1RH) than in Auto 2 (60.2 RH). On the other hand, the temperature is higher in Auto 2 (32.2°C) than Auto 1 (31.0°C). The average noise in Auto 1 is 69 – 90dBA while the average is 85 – 89 dBA for Auto 2.

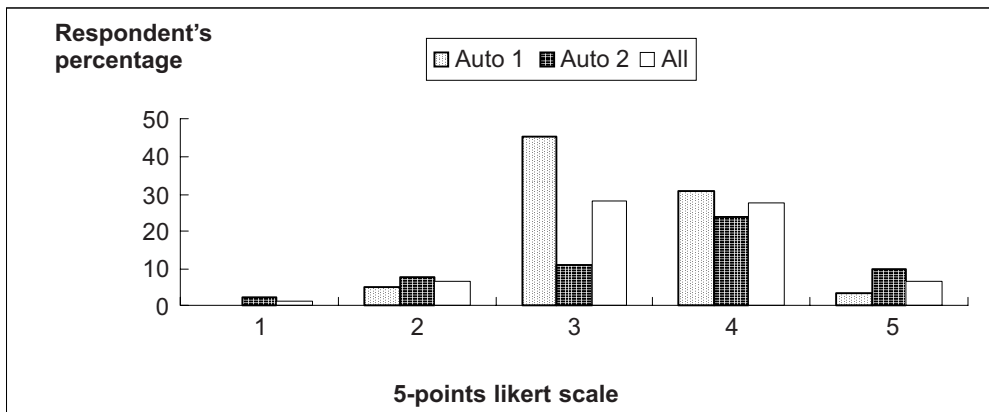


**Figure 7** Perception on temperature

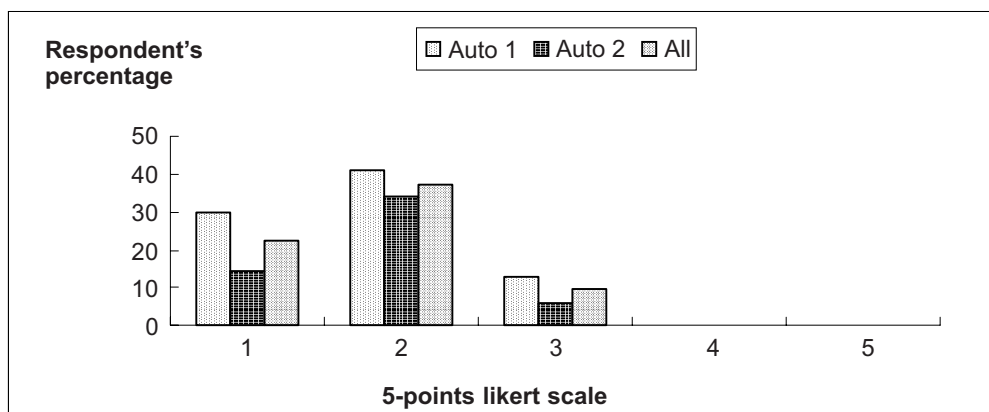




**Figure 8** Perception on humidity



**Figure 9** Perception on light

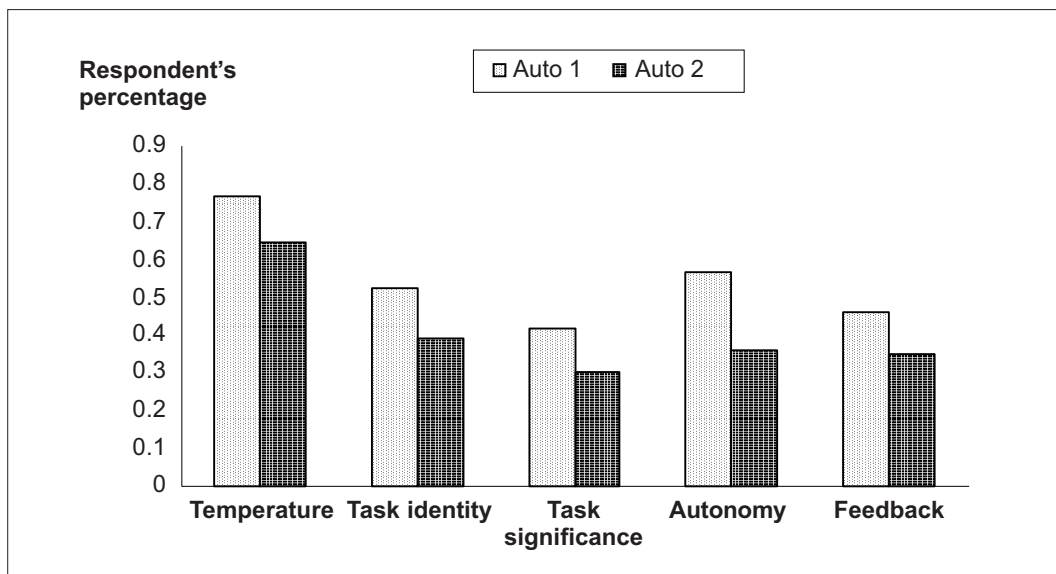


**Figure 10** Perception on noise

### 3.4 Reliability Measures

Reliability of questionnaire was tested using Cronbach alpha ( $\alpha$ ). Cronbach alpha is derived from the average correlations of all the items on the scale [15]. Out of twenty-two reliability measures in both companies, twelve have reliabilities above 0.7. Nine items have reliability measures around 0.6 and one item has reliability measures of at least 0.5. The results indicate that the reliabilities measure are high for job factors in both companies especially for skill, task identity, autonomy and feedback with values from 0.69 to 0.88.

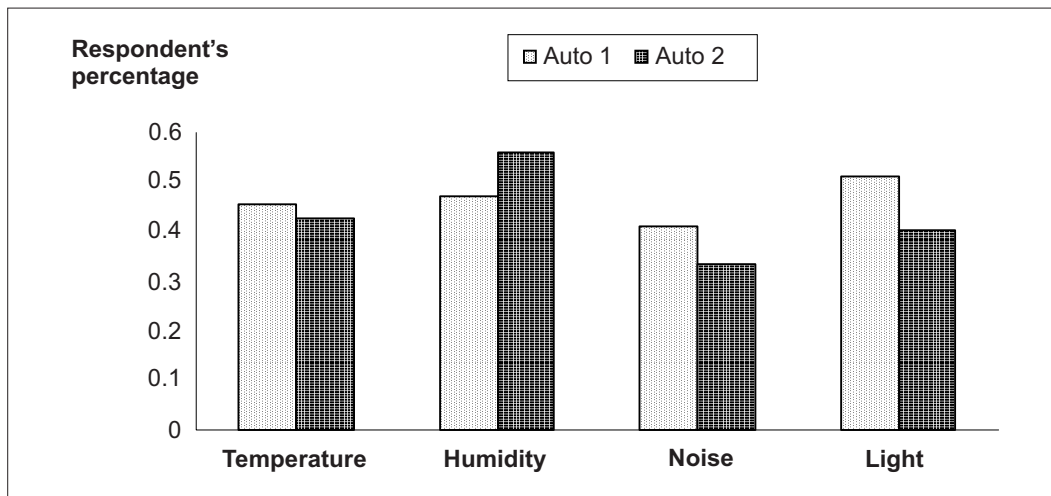
As for environmental factors, the reliabilities are high in Auto 1 for temperature, noise and light. However, temperature and humidity showed high reliabilities in Auto 2. Humidity for Auto 1 and light for Auto 2 showed moderate reliabilities. Assumptions on reliability were based on statistical reasoning [15] since no references were found except for job factors [17]. Here, the value of 0.65 and above is considered high and that between 0.65 to 0.3 are considered intermediate. Factors with reliabilities less than 0.5 were not considered for further analysis.



**Figure 11** Correlations of job satisfaction with five job factors

### 3.5 The Correlation Coefficient

In summary, the results indicate that there are significant correlations between job satisfaction, job characteristics and environmental factors (see Figure 11). There are several factors that strongly support the studies. Four factors that contributed to significant correlation in Auto 1 are skill variety, task identity, autonomy and light.



**Figure 12** Correlations of job satisfaction with four environmental factors

Meanwhile, two factors that have strong significant correlation in Auto 2 are skill variety and humidity (see Figure 12). The results are discussed in Section 4.

## 4.0 DISCUSSION

### 4.1 Factors for Job Characteristics and Satisfaction

The results of the study indicate that there is a significant positive correlation between job satisfaction and job characteristics factors (see Figure 11). This is in agreement with empirical studies by Hackman and Oldham [14] and Umstod *et al.* [18]. It can be seen that the correlation of job satisfaction with job characteristics are stronger in Auto 1 and Auto 2 than as found by Hackman and Oldham [14]. This could be due to emphasis on one particular industry in the study, e.g. automotive industries.

An outstanding factor revealed from the results is skill variety which appears to be strongly correlated in both companies. Generally, more than 80% of respondents agree that they utilized moderate to very high skill. Based on the findings, it seems that workers tend to find skill variety as an outstanding factor and has major impact on job satisfaction than other job factors. Hackman and Oldham [14,19] stated that skill, task identity and task significance are psychological factors contributing to workers experiencing meaningfulness in their work. However, results from this study suggest skill variety have greater impact on that matter than others.

More than 60% of the respondents from both companies have chosen Likert-scale 5 for task significant factor. This is expected as findings by Hackman and Oldham [14] showed that workers who tightens nuts on aircraft brakes assemblies are more likely to perceive his work as significant than the workers who fills small boxes with

paper clips even though the skill levels may be comparable. However, a low correlation with job satisfaction could mean that most workers are uneasy with the high responsibilities perception of the end products in this case vehicles that has a substantial impact on the lives of other people or external environment. This could be the reason why skill variety which is related to meaningfulness of the work [14] appears strongly correlated to job satisfaction as compared with task significance.

Generally with task identity, feedback and autonomy, more than 70% agreed that their jobs are identifiable and provide clear information about the effectiveness of their performance and autonomy. The correlations of the above factors indicate that Auto 1 are higher than Auto 2. This matter is discussed further in Section 4.3 relating to age, work experience and marital status.

Das [12], Hackman and Oldham [14,19] and Umstod *et al.* [18] stated that job satisfaction was one of the outputs in work design model that could be determined by job factors. Results from the study support this statement, suggesting that job factors are predictors of job satisfaction in work design. Therefore, the design of future work should emphasis on job enrichment to support those factors. In addition, the emphasis on job enlargement is also important to support other job factors in order to obtain the level of job satisfaction needed.

## 4.2 Environmental Factors and Job Satisfaction

The correlations of four environmental factors with job satisfaction are illustrated in Figure 12. There are significant positive correlations between job satisfaction and perception of all environmental factors. The values are from low to intermediate. The outstanding correlation for Auto 1 is perception on light and for Auto 2 is perception on humidity.

The correlations of job satisfaction with perception on temperature are about the same for both companies. Conversely, correlation of job satisfaction with perception on humidity factor is high in Auto 2 as compared with Auto 1. The measurements indicate that the average temperature and humidity is slightly higher in Auto 1 i.e. Auto 1: 31°C and 69.1 RH while Auto 2: 32.2°C and 60.2 RH. Further analysis using heat index [20] on the average temperature and humidity measurements taken from both companies showed that the average temperature and humidity of Auto 1 fell in the “very hot” band while average temperature and humidity for Auto 2 fell in the transition of “hot to very hot” band. The location of the assembly line in Auto 2 was in the middle of the factory compared with Auto 1, which was located near openings (doors and windows), which allowed additional heat from forklifts and vehicles activities affecting the work environment nearby. The above results show that workers perception on environment corresponds to the measurements. The results are consistent with ASHRAE [16] definition that thermal comfort is the condition of mind which expresses satisfaction with the thermal environment.

The correlation between job satisfaction and perception of light is higher in Auto 1 compared to Auto 2. Average measurement for lights is also higher in Auto 1 than in Auto 2. The high correlation in Auto 1 could be due to high average measurement value in lighting as light would cause discomfort or positive sensation such as pleasure and emotional sensation [13] that could affect respondents' perception. The study indicated that lighting condition in both companies were within the standard of Illuminating Engineering Society [21] i.e. 500-1000 lux for medium assembly. The results are consistent with workers' perception on lights as 90% are happy with the lighting in both companies.

The correlation of job satisfaction with perception on noise factor is slightly higher in Auto 1 than in Auto 2. Average measurements for the noise indicated that it is higher in Auto 2 compared to Auto 1 which suggested that Auto 1 has higher correlation than Auto 2. Psychological responses to noise could somehow affect mental health and emotional state, especially if the noise contribute to an already stressful environment [13].

The results indicate that environmental condition especially temperature, humidity, noise and lighting can affect job satisfaction in automotive industries. More than 60% of the respondents are not satisfied with temperature, humidity and noise conditions in both companies. On the other hand, 90% felt comfortable with lighting condition in both companies. This was supported by the illuminance measurement taken that was within the standard of Illuminating Engineering Society [21]. The management of both companies should put emphasis on temperature, humidity and noise as these measurements are outside the comfortable boundary. Dissatisfaction with environmental conditions could reduce job satisfaction hence productivity. It is suggested that standard environmental conditions (temperature, humidity, noise, light etc) be revised for automotive industries in Malaysia in order to improve workers' health physically and mentally, for productivity, job satisfaction and performance.

#### **4.3 The Effect of Job Satisfaction on Age, Work Experience and Marital Status**

It is obvious from Figure 11 that the correlation between job satisfaction and job characteristics factors are higher in Auto 1 than in Auto 2. It is observed that older, married and more experienced workers in Auto 1 are highly satisfied with their work than the younger, single and less experienced workers in Auto 2.

Age is one of the factors affecting job satisfaction. Studies in five different countries proved that elder workers are more satisfied than their younger counterparts [2]. The results also supported findings by Janson and Martin [22] and McCaslin and Mwangi [9] who found that older employees have higher job satisfaction. Lee and Wilbur [23] suggested that job satisfaction increased with age. One explanation for such a finding was that the older employees are more capable of adjusting their expectations to the returns of their work [24].

The lack of job satisfaction amongst younger workers might cause them to be more mobile and seek greener pastures elsewhere. If this goes unchecked, Auto 2 will have a shortage of skilled and experienced workers in the future.

Work experience is only one of the many aspects related to the length of employment that can be correlated with perceived job satisfaction. However, there is no literature supporting relationship between job satisfaction and years of experience [25,26]. Research done by Bowen *et al.* [6], McCaslin and Mwangi [9], Manthe [8], Boltes *et al.* [5] and Bertz and Judge [27] found that overall job satisfaction increased as the years of experience increased.

Research on relationships between work satisfaction and marital characteristics in particular is extensive. It is primarily found in literature on marital satisfaction, work identity and satisfaction and dual career couples [28-30]. These studies suggest that career and family lives are related with one another and that to understand strain in one domain it is essential to have information on both facets of an individual's life [31]. Therefore, further research to resolve the above matter is necessary.

## 5.0 CONCLUSIONS

The results of the study indicate that there is a significant correlation between job characteristics factors, environmental factors and job satisfaction. In summary, the conclusions derived from this investigation are:

- (i) The results highlight that skill variety is an outstanding factor in the study of job satisfaction for automotive industries.
- (ii) The strength of the correlation between job factors and job satisfaction is influenced by age, work experience and marital status.
- (iii) There is significant correlation between job satisfaction and environmental factors.
- (iv) The environmental factors affect job satisfaction and the strength of correlation is influenced by surrounding, context depending and function of the building.

The above conclusion supports our proposed study of work design particularly for the automotive industries. Implicitly automotive industries may benefit from the methodology as it can diagnose job satisfaction to maintain performance and productivity. Further study may be conducted to determine the validity of the methodology in other industries as well as taking into consideration job organization and social factors.

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