

# ROLE OF WORK ENVIRONMENT ON NEED SATISFACTION IN ASIA'S LARGEST TRANSPORT PUBLIC SECTOR ORGANISATION THE INDIAN RAILWAYS

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**Abstract** *A healthy work environment is important to create social relations at workplace and also to maintain the relationship between colleagues, supervisors, managers, and the organisation. And also, effective results & productivity for any organisation is confined in the level of satisfaction of employees and work environment in which they work. This research paper is an attempt to study the effects of multiple dimensions of work environment on need satisfaction in Asia's largest public sector organisation. Significant zero-order ( $p < .001$ ) correlation of perceived work environment with need satisfaction was observed. Robustness check to use OLS Multiple Regression Analysis was carried out and satisfied. Multiple regression analysis showed six critical predictors in perceived work environment of need satisfaction, explaining 50.09% of the variance. Cohen's  $f^2$  values showed effect size magnitude is real and is very large varying from 0.672 to 1.037. Implications for organisation are discussed.*

**Keywords:** Loco Pilot, Work environment, Public, Indian Railways

## INTRODUCTION

The success of Indian Railways is largely dependent on the performance of loco pilots. Indian Railways are investing a lot in procuring hardware, but unless adequate care is taken towards the human-ware, the Indian Railways will have problem. Recognising this, Indian Railways has started looking into the inner side of the workers' behaviour. A sick mind can never create healthy organisation. Various intervention programmes are being conducted to diagnose the prevailing ambiguity in some category of workers. For performance improvement, looking at the existing mind-set of workers and finding out ways to inculcate willingness for betterments from their inside appeared lucid. Field experience indicates that a rail engine driver alone rarely causes a railway accident. It is caused by more than one person, who commit error in their roles at same time. In a number of day-to-day happenings, it has been observed that a single person i.e. the driver can prevent accidents, if he is committed to the job and the organisation.

It has been constant endeavour of the Railways to pass on the benefits of the improved performance to the people and to national economy. The popular slogan of Indian Railways - *safety, security and punctuality* is catchy; it requires immense skills, alertness and, above all, devotion to duty to live up to the avowed principles. Although, there is no

dearth of skilled and dedicated workers, accidents do occur on Indian Railways, which tend to tarnish the image of this prestigious organisation. In the hierarchy of priorities, safety obviously ranks first. A transport system can never call itself efficient and reliable unless it is safe and secure. An accident not only throws the train services out of gear but also very often snatches away many precious lives and causes heavy loss to railway property and public goods. An accident undoubtedly tarnishes the image of the Railways, shakes its credibility, and destroys the confidence the public reposes in it. The quality and efficiency of service have assumed greater importance in a liberalized economy where the expectations of the traveling public and other rail users are very high. The performance of railwaymen must, therefore come up to their expectations.

Safety has been a management priority area and as in spite of relentless efforts aimed at enhancing safety in train operations, a number of accidents continue to occur. Safety research is also being undertaken to examine the human angle in details e.g. unfavourable working conditions, long duty hours, shortcoming in rules and regulations, etc. recommended by the Railway Reform Committee. Concurrently, action is being taken to use Accident Enquiry Reports more as a means of learning from mistakes and counseling staff rather than fault finding and punishing them.

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We use the term perceptions of the work environment broadly to refer to employees' observation, interpretations, and/or evaluations of their groups' working conditions, pattern of interaction, norms, climate, culture, outcomes, or external contacts and competitors. Measures of perceptions of the work environment are common in group-level, organisation-level, and multilevel studies. Thus, for example, Schmitt, Sacco, Ramey, Ramey and Chan (1999) used a measure of perceptions of the work environment i.e., teachers' perceptions of school climate - as a key independent variable in their recent longitudinal study of children's academic and social development. Shamir, Zakay, Breinin, and Popper (1998) assessed perceptions of the work environment in asking members of military units to rate their own unit's discipline and unit culture. Tesluk and Mathieu (1999) assessed perceptions of the work environment in asking work crewmembers to rate their crew's effectiveness, teamwork processes, self-management and internal leadership.

The work environment refers to the relationship between a worker and his environment that can be broken down into different dimensions like the social, technical and economic in which the work is normally viewed and designed. Stephen P. Robbins (2005) advocates that working conditions will influence job satisfaction, as employees are concerned with a comfortable physical work environment. In turn this will render a more positive level of job satisfaction.

Kozlowski and Klein (2000) found that group member social interaction and work inter dependents were significantly positively related to within group agreement, regarding perception of the work environment.

A positive work environment is not only important for our physical, mental, and emotional health, but is also important for the product or service we produce for the company. The better we feel at work, the more likely we will take pride in our work functions and be loyal toward our place of employment.

Need satisfaction for many years was viewed as a single, unified concept, but it is now widely recognized as a more complex cluster of attitudes towards different aspects of job, arising from a person's expectations of work and his or her actual experiences (Clark, 1996). Nevertheless, extensive research by Smith, Balzer, Josephson, Lovell, Paul, Reilly, Reilly, and Whalen (1989) suggests that there are five major dimensions viz. work itself, pay, promotion, supervision, and co-workers. Employee's satisfaction is one of the most researched topics of organisational behaviour in India (Ganesh, 1990; Khandwalla, 1988; Padaki, 1988; Sinha, 1981).

Shyam (1999) conducted a study on jailors to ascertain the relationship between needs and job involvement. She found significant positive relationship between the two. Likert (1961) suggested that relationship between satisfaction and

performance would be more positive with the increase in the level of skill required by a job.

Different factors within the working environment such as wages, working hours, autonomy given to employees, organisational structure and communication between employees & management may affect job satisfaction (Lane, Esser, Holte, & Anne, 2010). Arnetz (1999) argues that it can be observed in organizations that employees mostly have problems with their supervisor who does not give them the respect they deserve. Supervisors also show harsh behaviour to employees due to which they are not comfortable to share good and innovative ideas with their supervisors. Furthermore, he describes that top management limits employees to their tasks rather than creating a sense of responsibility in employees by making them work in teams to attain high performance. Petterson (1998) argues that the interaction between employees within a business is crucial for accomplishing the organisational goals.

The main purpose of this piece of work is to identify predictors of need satisfaction among facets of perceived work environment. On concluding, the result will enable the railway management to analyze the problems relating to safety and the human element with the assumption that by taking care of the human side, it may be possible to reduce the human failure in train operation to significance level.

## METHODOLOGY

The zonal training centres, diesel/electric workers' training schools, and safety camps of the Indian Railways were contacted about availability of workers. The venue was selected keeping in consideration the control conditions for workers and away from monotonous and routine challenging job prevailing in railway working environment. The well-behaved rapport formation and communication was ensured between researcher and the subjects. The subjects were told about the utility of the study and their cooperation was solicited for success of the study. They were made sure that their identity would not be disclosed at any stage.

## Sample

The study was carried out on 400 loco pilots and the sample was spread in 34 divisions of Central, Eastern, Northern, North-Eastern, Southern, South Eastern, and Western zones of the Indian Railways. A purposive sample was selected from each zone to make findings representative to the population. Forty-two (10.5%) respondents were shunters, 65 (16.3%) were assistant loco pilots, 145 (36.3%) were loco pilots (goods train), 80 (20.0%) were loco pilots (passenger train) and 68

(17.0%) were loco pilots (mail/express train). The age of the respondents varied between 28 to 59 years, with mean age of 46 years. In education they varied between primary to post graduation, however, most of them were matriculates. 391 (97.8%) respondents were married, five (1.3%) were unmarried and rest divorcee/widower. The working experience varied between 3 to 41 years, with a mean experience of 23 years. The monthly income of the respondents varied between Rs. 21000 and 60000, with a mean income of Rs. 33780.

## OBJECTIVES

1. To study inter-correlation between need satisfaction and perceived work environment.
2. To identify significant predictors of need satisfaction among facets of perceived work environment.

## Hypothesis

**H1:** There would be a relationship between perceived work environment and need satisfaction.

**H2:** Regression coefficients ( $\beta$ ) are other than zero.

## MEASURES

Two standardized tools were used to study the level of need satisfaction and perceived work environment of copilots in rail work settings.

### Need Satisfaction Scale

Indian adaptation of Need Satisfaction scale (Khan & Mishra, 2002) was used. It was a bilingual scale. The psychometric properties of the scale were verified on the target population i.e. loco pilots under study. The number of items for each need varied. The five factors emerged in 15 items confirming five needs and renamed in the light of Maslow's need hierarchy. The responses of the identified items were added to generate individual need satisfaction score and on summing-up, all 15 items to generate overall need satisfaction score. Thus, the minimum possible score will be 15 and the maximum 75 for need satisfaction scale. High score indicates high level of need satisfaction and low score indicates low level of need satisfaction of loco pilots in rail work settings. One of the most commonly used reliability coefficient i.e. Cronbach's Alpha was determined. It was 0.82, significant at 0.001 levels of

significance. The internal consistency of the scale was quit high and this gives a support that the scale is reliable.

Content (face and logical) validity of the Hindi version of the scale was authenticated by professional psychologists/academic psychologists/technical instructors (about 10 experts) of Psycho-Technical Directorate, RDSO (Ministry of Railways), Department of Psychology, University of Lucknow, and zonal training centres of Indian Railways. In three of the railway zones (Central, Northern and Western) at a sample of 275 Workers, validity was established by conducting nondirective interviews. Using more structured method, confirmatory factor analyses present evidence of the measure's convergent and discriminant validity. Five factors emerged in the factor analysis. It is remarkable to mention that Porter reported five needs in the scale. In our case, factor analysis has clearly demarcated those five factors. The percent of variance accounted by factors varies from 28.7 to 7.6%. In summing up all the five factors explained 63.1% of the total variance. The factorial validity of the scale is clearly established.

### Perceived Work Environment Scale

Khan & Pandey's (2002) bilingual scale was used in this study. The responses of the identified items were added to generate individual perceived work environment dimension scores and summing-up all 46 items to generate overall perceived work environment score. Thus, the minimum possible score will be 46 and the maximum 230 for perceived work environment scale. Higher the score indicates high degree of agreement with the work environment facet and lower the score indicates high degree of disagreement with the work environment facet. One of the most commonly used reliability coefficient i.e. Cronbach's Alpha was calculated and was 0.93, significant at 0.001 levels. The internal consistency of the scale is quit high and this gives a support that the scale is reliable.

In Exploratory Factor Analysis, eleven factors emerged representing eleven different facets of perceived work environment. The percent of variance accounted by each factors varied from 25.7 to 2.3%. In summing up all the eleven factors explained 56.0% of the total variance.

## RESULTS & DISCUSSION

Zero order correlation of predictors with the criterion was calculated and results are showed in Table 1.

**Table 1: Zero Order Correlation of Predictors with the Criterion**

| Vabs | X1   | X2   | X3   | X4   | X5   | X6   | X7   | X8   | X9   | X10  | X11  |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Y    | 0.63 | 0.54 | 0.44 | 0.49 | 0.49 | 0.43 | 0.27 | 0.46 | 0.38 | 0.37 | 0.35 |

*r-value: 0.10 ( $p < .05$ ), 0.12 ( $p < .01$ ), 0.17 ( $p < .001$ )*

X1= Effectiveness of supervision/management, X2=Working Conditions, X3=Confidence in Management, X4=Monetary Gain, X5= Sociability & Co-operation within employees, X6=Opportunity for growth & development, X7=Sense of belongingness with the organisation, X8=Citizenship behaviour& recognition at work, X9= Work Relations, X10= Employee benefit programmes, X11=Job Stress, Y= Overall Need satisfaction

The zero order correlation of need satisfaction with all eleven facets of perceived work environment was determined and they all were positively highly correlated at 0.001 level of significance. Alternate hypothesis 1 is supported as probability to not support the hypothesis was ( $p < 0.001$ ). It can be inferred that if perceived work environment is increasing, so as the level of need satisfaction increases. In the next paragraph, multiple linear regression analysis is carried out in order to determine critical predictors of need satisfaction.

Multiple linear regression analysis was used to summarize the data as well as to study relationship between a single criterion variable and many predictor variables. Stepwise method for selecting the predictor variables for the regression model was considered suitable, as it is probably the most commonly used method. If the variable fails to meet entry requirements (either FIN: F-to-enter or PIN: Probability of F-to-enter), the procedure terminates with no predictor variable in the equation. If it passes the decisive factor, the second variable is selected based on the highest partial correlation. If it passes entry criteria, it also enters the equation. If it passes entry criteria, it also enters the equation.

The Task Force on Statistical Inference of the American Psychological Association recommended that researchers “should *always* provide some ES estimate when reporting

a *p* value” (italics added, Wilkinson and APA Task Force on Statistical Inference, 1999, p. 599) and further emphasized that “... reporting and interpreting ESs in the context of previously reported effects is essential to good research” (p. 599). The fifth edition of the APA (2001) *Publication Manual* also stressed the importance of ESs by stating “For the reader to fully understand the importance of your findings. Further, an effect size for each significant predictor variable was computed to estimate the magnitude, or size, of an effect of predictor variable to criterion variable. Cohen’s  $f^2$  is one of effect size measures to use in the context of multiple regression analysis as suggested by Cohen (1988). The  $f^2$  effect size measure for multiple regression is computed as:

$$f^2 = \frac{R^2}{1 - R^2}$$

where,  $R^2$  is the squared multiple correlation. If value of the effect size higher than 0.35 then it is high effect size.

### Robustness Check

Before performing the analysis, the variables were scatter plotted to look into the nature of data for variables under study. When plot indicate that linearity is missing, than other methods of analysis, including transforming the data to achieve linearity was used. Other fulfillment of the assumptions (normality, linearity, equality of variance and independence) was ensured. Summary of the robustness checks is shown in Table 2.

**Table 2: Summary of Robustness Checks for OLS Regression**

| Test of Robustness  |   |                         |   | Whether robustness verified |
|---|---|-------------------------|---|-----------------------------|
| Multicollinearity Tolerance & VIF<br>(Range: Tol – 0-1, VIF- 1-9) | Heteroscedasticity White Test<br>(Range: $p < 0.05$ ) | Normality PP & QQ Plots | Independence Durbin – Watson<br>(Range: DW<3) |                             |
| (1)   | (2)   | (3)                     | (4)   |                             |
| Tol: 0.35 to 0.81<br>VIF: 1.24 to 2.83                            | $\chi^2=19.94$ ,<br>$p < 0.02$                        | Satisfied               | DW = 1.978                                    | Yes all 4                   |

Robustness check confirms that variables under study are confirming all four requisite assumptions and multiple linear regression analysis can be carried out.

In the regression equation, slop ( $\beta$ ) is the standardized coefficients and change in fitting predictor variable for a change in criterion variable. The hypothesis under test was

that, there is no linear relationship between criterion variable (Y) and predictor variables (X’s) and slope of the population regression line is zero. Table 3 shows the regression analysis outputs for the Need satisfaction as the criterion.



**Table 3: Multiple Linear Regression Analysis****Criterion Variable:** Need Satisfaction**Predictor Variables:** Perceived Work Environment and dimensions

| Predictor variables in the model  | $\beta$ | Multiple R | R square | F-value | p    | Cohen's $f^2$ |
|---|---------|------------|----------|---------|------|---------------|
| <b>(ModelY1= a + <math>\beta_7X_7</math> + <math>\beta_{14}X_{14}</math> + <math>\beta_{12}X_{12}</math> + <math>\beta_9X_9</math> + <math>\beta_{10}X_{10}</math> + <math>\beta_8X_8</math>)</b> |         |            |          |         |      |               |
| X7  | .227    | .634       | .402     | 267.426 | .000 | 0.672         |
| X14   | .189    | .662       | .438     | 25.401  | .000 | 0.779         |
| X12   | .175    | .682       | .465     | 19.913  | .000 | 0.869         |
| X9  | .168    | .699       | .489     | 18.726  | .000 | 0.957         |
| X10   | .137    | .709       | .503     | 10.740  | .001 | 1.012         |
| X8  | .115    | .714       | .509     | 5.475   | .020 | 1.037         |
| Constant  | 9.710   |            |          |         |      |               |

X7= Effectiveness of Supervision/Management, X8=Working Conditions, X9=Confidence in Management, X10=Monetary Gain, X12=Opportunity for Growth & Development, X14=Citizenship Behaviour&Recognition at Work

In Table 3, six variables of perceived work environment (Effectiveness of Supervision / Management, Working Conditions, Confidence in Management, Monetary Gain, Opportunity for Growth & Development, and Citizenship Behaviour, & Recognition at Work) entered into the model with need satisfaction after passing the criteria (probability of F-to-enter = 0.05). Statistic effect size helps us in determining if the difference is real or if it is due to a change of factors. In hypothesis testing, effect size, power, sample size, and critical significance level are related to each other. The dimensions of the perceived work environment are shown in terms to increasing order of the standardized regression coefficients.

It can be inferred that when one unit is increasing in Effectiveness of Supervision/ Management, Working Conditions, Confidence in Management, Monetary Gain, Opportunity for Growth & Development, and Citizenship Behaviour & Recognition at Work, so as the increase is in need satisfaction. Effectiveness of Supervision/Management emerged as first and Citizenship Behaviour & Recognition at Work as last significant predictors.

### Goodness of Fit of Model

A commonly used measure of the goodness of fit of a linear model is  $R^2$ , or the coefficients of determination. If all the observation falls on the regression line,  $R^2$  is 1. If there is no linear relationship between the criterion and predictor variable,  $R^2$  is zero.  $R^2$  of zero does not necessary mean that there is no association between the variables. Instead, it indicates that there is no linear relationship.

Table 3 shows that 50.9% of the variance is explained in need satisfaction by six facets of perceived work environment. Cohen's  $f^2$  values showed effect size magnitude is real and is very large varying from 0.672 to 1.037. The regression

model is explaining large amount of variation in need satisfaction and can be assumed that it is a good fit model. Alternate hypothesis 2 is supported as regression coefficients for at least six predictors were other than zero.

### DISCUSSION

In this research, we examined the correlates and predictors of need satisfaction. From the time McGregor (1960) applied Maslow's (1943) needs-hierarchy theory to the field of management, considerable research has explored the relation of human needs to job attitudes and work motivation. Some of the studies have utilized needs-hierarchy theories (Alderfer, 1972; Maslow, 1943), some have used other needs theories (e.g. McClelland, 1985; Murray, 1938), and some have been a theoretical in their points of departure. Aspects of the environment likely to allow need satisfaction are predicted to yield positive outcomes, whereas those likely to thwart need satisfaction are predicted to yield negative outcomes.

The first issue that was investigated concerns the relationship of intrinsic need satisfaction to the outcome variables of perceived work environment. As assessed, all dimensions of perceived work environment are positively and significantly ( $p < 0.01$ ) related with need satisfaction. Cohen's  $f^2$  values for effect sizes showed magnitude is real and is not due to chance.

### CONCLUSION

The purpose of the study was to investigate the relationship between work environment and job satisfaction of employees in Asia's largest transport system, Indian Railways. Review of literature provided a strong evidence of the relationship between the studied variables. Analysis and interpretation

of the data have empirically demonstrated that inefficient supervision, unfavourable working conditions, uncertainty in management approach, lack of opportunity for growth & development and subordination behaviour at work place are some factors to enlarge job dissatisfaction.

On the other hand, good working condition, refreshment & recreation facility, health & safety facility, fun at workplace increase the degree of job satisfaction. Effectual human resource management and preserving progressive work environment would consequences the job satisfaction and performance of organisation as well as entire economy. Hence, for the success of organisation it is vital to accomplish HRM successfully and maintain healthy work environment which will satisfy the employees.

## IMPLICATIONS

The implications of this research may be summarised as follows:

1. Favourable working conditions at work places act as a positive catalytic force in enhancing level of job-perfection which in turn upgrades physical outputs of employees.
2. In a large organisation like Railways there may be many workers having negative mind-sets. Employees' mindset about working environment can be identified with the help of suitable psychometric tool, some of them have been discussed in above paragraphs. These people are required to be counselled by professional psychologists available at zonal railways with an effort to mold their attitude in positive directions. People at higher/supervisor level needs to review their own attitude about subordinates and work environment. Otherwise, the exercise of attitude molding of others would be futile.
3. Supervisors are the backbones of any organisation. It is very easy to brand them bad for their lapses but no proper system is available to upgrade their quality and skill. Sermons, rebuke, or even punitive measures are no means to improve their quality. Training courses available for supervisors are mostly of routine nature and such courses can hardly bring about changes in their behaviour.
4. As managers to up, the ladder of service they tend to forget or disown the constraints, difficulties and problems faced earlier and they seem to live in a "make-believe" world of "everything-is-alright". This is further aggravated by the attitude of "top-is-right-bottom-is-wrong". Such attitude needs to be discarded and managers should be encouraged to brave the ground reality and undertake system-management and system development in right direction.
5. A human touch in management is very much desirable, who is dealing with these workers, and they should feel that management is looking after them. Workers grievances are to be redressed much faster to remove their main worries in order to enable them to devote their mind peacefully at work. People who are working honestly are to be encouraged and those not doing so should be discouraged. Officers and supervisors should inculcate a habit of appreciating good work done by these people.
6. Trust and confidence in the organisation can open up employees emotionally and raise concern for the organisations' well-being. Going back on the organisation or violating someone's trust becomes subject to disapproval by the individual or his/her reference group. The individual gains strength from such trust and remains committed to work practices and normative behaviour expected from employees.
7. A caring approach towards employees and consistency in the managements' thought and action affect employee interest and inspire trust and confidence in the decision-making body of the organisation. Mature interactions between employees and decision-making bodies nurture greater confidence and mutual trust if the employees perceive themselves to be part of the decision-making process. Once this process is set into motion the inner dynamics are continuously re-tuned and charged to maintain the level of trust and confidence in the organisation.
8. Working environment influences mind-functioning, mental efficiency and mental output. It is feasible to improve working environment as under –
  - Development of positive climate of understanding, faith and trust.
  - Improvement in inner-personal relation between employees, supervisors and officers embracing social relation.
  - Maintenance of healthy industrial relation and introduction of public relation exercise amongst railway men.
  - Maintenance of high employee-morale.
  - Improvement in discipline-culture, work-culture, management-culture and trade-union culture.
  - Maintenance of transparency along with equality in justice in dealing with employees.
  - Efficient functioning of staff grievance redressal machinery.
  - Encouragement to creative ideas, constructive suggestions and good work.
  - Practice of human touch in man-management.

- Provision of employee-care facilities such as health-care, canteen, etc.
- Development of a climate of togetherness, team-spirit and family feeling.

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