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Research Article

A CAUSAL PARADIGM OF THE ANTECEDENTS OF ORGANIZATIONAL COMMITMENT – CASE OF LOCO PILOTS OF INDIAN RAILWAYS

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Abstract

Although several studies have examined organizational commitment in relation to needs satisfaction and work environment, none have investigated causal paradigm and antecedents of measured variables. Using path analysis modeling, this paper takes the first step at closing this literature gap. The direct effect of satisfaction of social needs, citizenship behaviour and recognition at work and work relations on organizational commitment was observed. The cumulative indirect effect of these variables on organizational commitment of Loco Pilots was significant. The results suggest that Indian Railways may need to focus more on these variables in spawning greater commitment among Loco Pilots. Organizational/managerial implications of casual paradigm of the antecedents of organizational commitment suggested.

Keywords: Loco Pilots; Shunter; Mail/Express; Indian Railways; Citizenship behavior; Work Relations.

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 until and unless adequate care is taken towards the human-ware, the Indian Railway will have problem. Recognizing this, Indian Railways have started looking into the inner side of the Loco Pilots' behaviour. A sick mind can never create healthy organization; various intervention programmes are being conducted to diagnose the prevailing ambiguity in some category of workers. Field experience indicates that a Loco Pilot alone rarely causes a railway accident. It is caused by more than one person, who commits the error in their roles at the same time. In a number of day-to-day happenings, it has been observed that a single person i.e. the Loco Pilot can prevent accidents, if he is committed to the job and the organization (Pandey & Khan, 2000).

Committed individuals' tend to confront organizational problems and issues, whereas the low-committed or those who have planned to leave the organization are more prone to sidetracking the organizations' main aims/goals in preference to their personal goals. It is likely that a high-committed workforce would try to solve organizational and personal problems differently from a low-committed workforce.

The main purpose of this piece of work was to develop a causal paradigm of need satisfaction and perceived work

environment as predictors having direct and indirect effect in predicting organizational commitment.

Organizational Commitment

According to the behaviorists, organizational commitment is demonstrated by "overt manifestations of commitment" (Mowday, Steers, and Porter, 1982) to the organization such as extra-role behaviors that link employees to their respective institution. Further, by remaining with the organization, employees accumulate "investments" or "side bets" that make leaving the organization very costly (Becker, 1960; Meyer and Allen, 1984).

In contrast, to the behavioral approach to organizational commitment, the attitudinal approach recognizes that "the identity of the person (is linked) to the organization" (Sheldon, 1971); and thus, the person develops an emotional or psychological attachment to his or her employer. Organizational commitment, as defined by Allen and Meyer, consisted of three components: affective, continuance and normative. Affective commitment is characterized as an emotional or psychological attachment to the organization. Continuance commitment is defined as a need to stay with the organization because one has accumulated too many investments and leaving would therefore be very costly. Normative commitment is characterized by the employee's belief that he or she is obligated to stay with a particular organization because of personal loyalty and/or allegiance.

Balogun et.al, (2013) in their study revealed significant joint and independent influence of job demands, job control, psychological climate, and affective commitment on turnover intention of employees. Furthermore, affective commitment directly and fully mediated the relationship between psychological climate and intention to quit.

Need Satisfaction

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 *et al.*, 1996). Nevertheless, extensive research by Smith *et al.*, (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 organizational behaviour in India (Ganesh, 1990; Khandewalla, 1988; Padaki, 1988; Sinha, 1981).

A person's behaviour is the result of several factors or needs/motives. Knowledge of the typical, primary needs/motivators of behaviour in a work setting can help managers/ employers to deal more effectively with employees. To predict behaviour, manager must know which needs or motives of people evoke a certain action at a particular time. Motives are the 'whys' of behaviour. They arouse and maintain activity and determine the general direction of the behaviour of an individual. In essence, motives or needs are the mainsprings of action. All individuals have many different hundreds of needs. All of these needs compete for their behaviour. What, then, determines which of these motives a person will attempt to satisfy through activity? According to Maslow (1943), when a need is satisfied, it is no longer a motivator of behaviour and other competing need becomes more potent. Maslow (1943) developed an interesting framework that helps in explaining the strength of certain needs. According to Maslow, there seems to be a hierarchy into which human needs arrange them as physiological, security, social, esteem and self-actualization. Khan and Mishra (2003) evolved order of need satisfaction in case of Loco Pilots as: social, self-accomplishment, compensation, autonomy and esteem.

Sinem and Baris (2011) in their study found positive relationship between job satisfaction and affective, continuance and normative organizational commitment and was confirmed by regression analysis. According to the regression analysis, it was found that there is a significant and positive relationship between affective commitment and internal - external job satisfaction.

Perceived Work Environment

When the going is Tough, only the Tough gets going'. Adverse/hostile environments dampen an ordinary man's spirit. Thus performance under adverse environment is difficult, painful yet a rewarding opportunity. Measures of

perceptions of the work environment are common in group-level, organization-level, and multilevel studies. Thus, for example, Schmittand *et al.* (1999) used as 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 *et al.*and(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. Faulty perception of job is reflected in bad performance. It also invites danger to public life and damage to public property, pollutes work place relations, invites strikes, absenteeism of workers and loss of production (Pandey and Khan, 2000). Faisal (2010) in her study showed that while the work environment may not be openly hostile, women employees were dissatisfied with arrangements to accommodate their personal and family needs. Significant differences were found in perceptions of women belonging to different categories of public sector organizations. Unmarried females working on contract were more satisfied with the working conditions than married women on permanent posts.

Output of a machine depends on machine-efficiency and machine-input. Likewise, human-output is related to human-efficiency and human-input. It may be pointed out in this respect that behaviour of a human is of much superior nature over that of a machine. Whereas, machine-efficiency is fixed by design, human-efficiency is not so limited, that is, much more response is obtainable from employees if the climate of organization is fine-tuned. It is possible to obtain human-output such as loyalty, devotion and sincerity etc. by ensuring a series of human inputs like employee morale, recognition, satisfaction, encouragement etc. and such intrinsic output is possible only through development of a congenial employee-friendly environment.

Objective

To study the causal relationship between facets of perceived work environment and need satisfaction in instilling organizational commitment.

Method

Loco Pilots of Indian Railways was the target population to study. The subjects were told in detail about the utility of the study. They were assured that the responses indicated by them should be used for research work only, which will help in having a thought-provoking look at various problems and human resource development programme/ interventions on Indian Railways.

Sample

A sample of 400 Loco Pilots was drawn from thirty-four divisions of Central, Eastern, Northern, North-Eastern, Southern, South Eastern and Western zones leaving only two zones unattended of the Indian Railways. The technique to select the sample was Stratified Random Sampling, as Indian Railways has unique identity number for each Loco Pilots and was possible to include in the target study. Twenty-nine (10.2%) respondents were Shunter, forty-five (15.8%) were Asst. Loco Pilots, one hundred eight (37.9%) were Loco Pilot (Goods), fifty-seven (20.0%) were Loco Pilot (Passengers) and forty-six (16.1%) were Loco Pilot (Mail/Express). The age of the respondents varied between 28 to 59 years, with mean age of 45 years. In education they varied between primary to post graduation, however, most of them were under or matriculate. Three hundred ninety one (97.8%) respondents were married; five (1.3%) were un-married and rest divorcee/widower. The working experience varied between 3 to 40 years, with a mean working experience of 23 years.

Measures

The Indian adaptation of Organizational Commitment Scale (Khan and Mishra, 2003), Porter's Need Satisfaction Scale (Khan and Mishra, 2002a) and Khan and Pandey, (2002) were used to collect data from Loco Pilots of Indian Railways. All the three scales were bilingual (Hindi/English) in nature and psychometric properties verified on the target population. Brief descriptions of measures along with psychometric properties are reported in forthcoming paragraphs.

Organizational Commitment Scale

Indian adaptation of the organizational commitment scale was used to study level of Loco Pilots (Khan and Mishra, 2003). The organizational commitment scale having 18 items measuring three dimensions (affective, continuance and normative) was identified to use. The psychometric properties of the scale were verified on the target sample. Estimation of median reliability for organizational commitment scale appeared rational and it was found to be 0.87 on the target sample. The coefficient was higher than as reported by (Allen and Meyer, 1996) and found significant at 0.001. Originally, the scale was on a 7 point Likert format. But, considering the literacy level of population being under or matriculate, the scaling was changed into 5-point Likert format (5= Fully satisfied, and 1= Not at all satisfied) in case of need satisfaction scale and (5= Strongly Agree, and 1= Strongly Disagree) for organizational commitment scale.

Need Satisfaction Scale

The modification of (Porter's, 1961) scale based on Maslow's theory of human motivation; Need Satisfaction Questionnaire (NSQ) was identified to study the needs of Loco Pilots in rail work settings. The scale contained 15 items designed to endow with the information about five

different motivational needs viz. security, social, esteem, autonomy and self-actualization. The scale was translated in Hindi and finally, Indian adaptation of Need satisfaction scale (Khan and Mishra, 2002a) was used. It was a bilingual scale. The need satisfaction scale having 15 items designed to provide information about five different motivational needs viz. compensation, social, autonomy, esteem and self-accomplishment. The needs were re-named after detailed job-analytic study of the Loco Pilots. In order to know as to how reliable the scale is, there is several different ways to measure reliability (Lord and Novick, 1968; Nunnally, 1978). One of the most commonly used reliability coefficient (Cronbach's Alpha) based on internal consistency of the scale was calculated and found 0.82, significant at 0.001 level. The factorial validity of the scale was established using confirmatory factor analysis and five factors emerged accounting 63.1% of total variance.

Perceived Work Environment Scale

Khan and Pandey (2002) Perceived Work Environment Scale was used sensitivity of Loco Pilots about work environment. The scale consists 46 items, measuring different eleven facets (effectiveness of supervision/management, working conditions, confidence in management, monetary gain, sociability and cooperation within employees, opportunity for growth and development, sense of belongingness with the organization, citizenship behaviour and recognition at work, work relations and employee benefit programmes) of work environment. The 5-point Likert format was used to indicate the extent of their agreement with each item anchors labeled (5= Strongly Agree and 1= Strongly Disagree). Thus, the minimum possible score of the scale was 46 and the maximum 230. Higher the score indicates high level of agreement and lower the score indicates low-level agreement on the work environment dimension. The psychometric properties of the scale were verified on the target sample. Cronbach's Alpha of the scale was 0.93, significant at 0.001 level. The internal consistency of the scale is quit high and this gives a support that the scale is reliable.

Good correspondence was found to exist between the scale results and the considered judgments of experienced observers. Using a more structured method, confirmatory factor analyses present evidence of the measures' convergent and discriminant validity. Eleven factors emerged in the factor analysis representing eleven different facets of perceived work environment. The percent of variance accounted by factors varied from 25.7 to 2.3%. In summing up all the eleven factors explained 56.0% of the total variance.

Procedure

The scales were administered in control conditions on a group of 40 to 50 Loco Pilots at the Zonal Training centers/Safety camps of the railways, where they used to

visit for training/refresher courses. They were asked not to write their name on the answer sheets.

Technique

Path analysis has become a popular form of data analysis in social science studies, because it provides possibilities for causal determination among sets of measured variables. A principal objective of science is to build theoretical explanations of social phenomenon. When the underlying assumptions of path analysis are met, theory and data may be related in situations where many variables are to be handled simultaneously. Path analysis is essentially a data-analytic technique using standardized multiple regression equations in examining the theoretical models.

Extravagant hopes for causal explanations should not be entertained- at least not yet. The inability to deal with all variables in a social system, to measure and plot their exact interactions, makes the results in most problems only first approximations to causality. But the power of the technique continues to challenge researchers, and its use is proliferating.

A researcher commonly wishes to discover the relationship of predictor variables to a criterion variable. Simple and multiple correlations are utilized and often yield important relationships, yet they never demonstrate causality. Six steps in the application of path analysis are listed below:

1. Develop a Causal Scheme
2. Establish a pattern of associations between the variables in the sequence
3. Depict a path diagram
4. Calculate path coefficients
5. Test for 'goodness of fit' with basic model
6. Interpret the result

The results of the study are being discussed in the forthcoming paragraphs.

Results

1. Develop a Causal Scheme

This technique allows us to state a theory in the form of a linear causal model. The most important variables on the basis of (zero-order correlations) are sought, and all others are regarded as 'residual'. This process assumed to be on the basis upon the results of past research and current theory.

Satisfaction of social (X2) needs, perception about citizenship behaviour and recognition at work (X14) and work relations (X15) are important predictor variables and will help in determining the subsequent organizational commitment (Y4) of Loco Pilots in their work settings. This is the linear statement or temporal order and may be written as follows:

$$(X2 \Rightarrow X14 \Rightarrow X15) \Rightarrow Y4$$

2. Establish a pattern of associations between the variables in the sequence

The conceptual framework now to be translated into quantitative estimates on the basis of pattern of association of the variables in the sequence. This will help to measure the gross magnitude of the effect of an antecedent variable upon the consequent variable.

3. Depict a path diagram

Path diagrams are generally illustrated, as in Fig. 1, by means of one headed arrow connecting some or all of the variables included in the basic model. Variables are distributed from right to left, depending upon their theoretical ordering. Inter-correlations between variables not influenced by other variables in the model are called *exogeneous* variables, which refer to all variables prior to and outside the model. The remaining subset of variables (which may consist of only one variable) is taken as dependent, and these are called *endogenous*. The lines running from one measured variable to another represent the direct influences of one variable upon another. There are also indirect influences. Variables recognised as effects of certain antecedent variables may, in turn, serve as a causes for subsequent variables. Finally, residual path showing vertical line has been drawn and are due to causes not recognised or measured, and departures of the true relationships from additivity and linearity, properties that are assumed throughout the analysis.

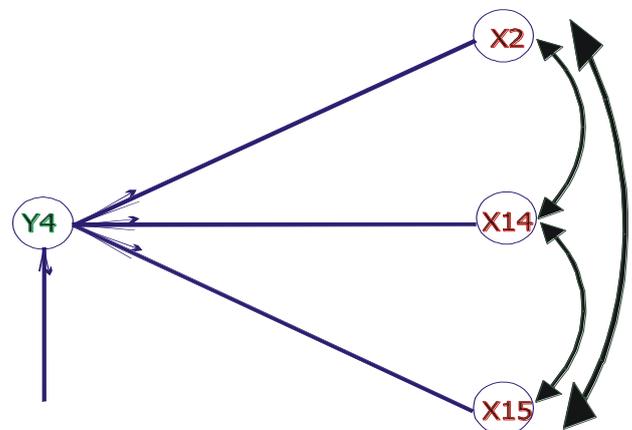


Fig. 1: Path Diagram Basic Model

4. Calculate Path coefficients

Path coefficients reflect the amount of direct contribution of a given variable on another when effects of other related variables are taken into account. Path coefficients are identical to partial regression coefficients (betas) when the variables are measured in standard form. Nygreen (1971) Interactive Path Analyzer (IPA) program was used to calculate the coefficients, direct/indirect effects, residual effects and coefficient of determination (goodness of fit model) and are given in Table 1.

Table 1: Direct (diagonal) and Indirect Effect of Perceived Work Environment and Need Satisfaction jointly on Organizational Commitment

Causal Variables	X2	X14	X15	Total (direct and indirect) effect
X2	0.142558	0.046764	0.035811	0.225133
X14	0.045191	0.147520	0.035811	0.228522
X15	0.043908	0.045436	0.116268	0.205612

X2 = Satisfaction of Social need, X14 = Citizenship behaviour and Recognition at work, X15 = Work Relations

Now enter the path coefficients on the path diagram with effect of antecedent variable. The final path diagram along with quantitative estimates is depicted in Fig. 2 and awaits evaluation.

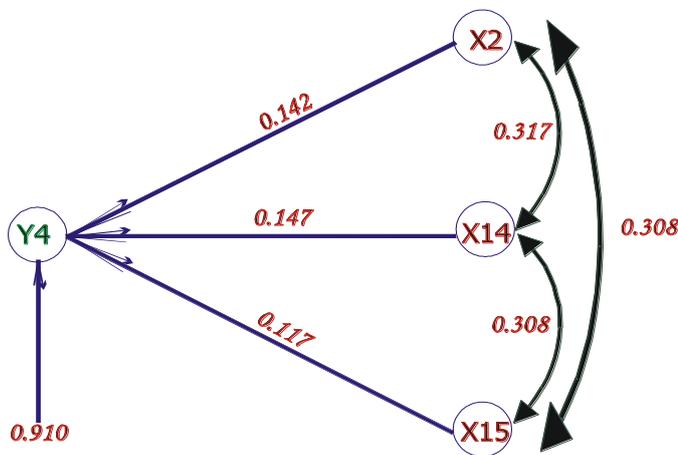


Fig. 2: The Path Model for the Causal Scheme

5. Test for ‘goodness of fit’ with basic model

The crux of the analysis is the test for goodness of fit between the observed data and the basic model. The partial regression coefficients in standard form and the coefficients of determination for specified combination of variables are essential for applying the goodness-of-fit criterion and are exhibited in Table 2 .

Table 2: Coefficient of determination and Partial Regression Coefficients in standard form for different combination of variables

Causal Variables	X2	X14	X15	Coefficient of Determination (R ²)
X2	0.228495			0.05221
X14	0.169770	0.174638		0.07813
X15	0.142558	0.147520	0.116268	0.08971

X2 = Satisfaction of Social need, X14 = Citizenship behaviour and Recognition at work, X15 = Work Relations

Table 2 shows the coefficient of determination for organizational commitment and for satisfaction of Social needs was 0.052, which is to say that 5.2% of the variation in the organizational commitment was accounted by satisfaction of social needs. Similarly, 7.8% of the variation in organizational commitment may be accounted for together by satisfaction of Social needs and Citizenship behaviour and Recognition at work . Finally, 8.9% of the variation in organizational commitment was explained jointly by satisfaction of Social needs, Citizenship behaviour and recognition at work and Work relations. Note that satisfaction of Social needs, Citizenship behaviour and recognition at work and Work relations were not helpful in explaining the much variance. The unexplained variation was $1 - R^2_{4,123} = 0.91029$. The model left unexplained 91% of the variance in organizational commitment. This is not satisfactory as might be hoped. The ‘unexplained’ variation is due to variables or measurement error not included in the model. As ‘residual’ path is large, it must not be assumed that the size of the coefficient is necessarily a measure of success in explaining the phenomenon under study. “The relevant question about the residual is not really its size at all, but whether the unobserved variables it stands for are properly represented as being uncorrelated with the measures of antecedent variables”.

6. Interpret the result

The variables in the causal scheme may be studied directly for their direct and indirect effects. The direct effect of satisfaction of Social needs, Citizenship behaviour and recognition at work and Work relations on organizational commitment were shown by path coefficients 0.142558, 0.147520 and 0.116268 respectively. None of them was particularly large. Nevertheless, the cumulative indirect effects were significant. Satisfaction of Social needs, Citizenship behaviour and recognition at work and Work relations individually and inconjunction with influences the organizational commitment of Loco Pilots. At the same time, many other factors/variables of even greater influence are clearly operating to determine the organizational commitment and are beyond the scope of the study.

Discussion

The result of covariance structural analysis with maximum likelihood estimation gives squared multiple correlations giving an idea of model fit social need accounts for 14.26% variance, Citizenship behaviour and recognition at work and Work relations accounts for 14.75% in organizational commitment.

The assessment of model and model fit is the basis forming either accepting or rejecting the model and towards accepting one competing model over another. The results of model fit conclude the satisfaction of social needs, citizenship behaviour and recognition at work and Work relations individually and inconjunction with influences the organizational commitment of Loco Pilots. Also the

dependent variable error estimated for organizational commitment while considering social needs, citizenship behaviour and recognition at work and Work relations as critical predictors and are quite large indicating that cumulative indirect effects being significant.

The model conveys the causal assumptions as theoretically predicted but at times not necessarily one that produces validated causal conclusions which directs the scope for subsequent replications and need for future study, further originating from finding of this study.

The correlation coefficients between causal factors and the effect are approximately equal to its direct effect, then correlation explains the true relationship and a direct prediction through these facets will be effective. Some other important results of the study are:

1. Perceived work environment is positively and significantly related with normative and overall organizational commitment. The relationship divulges that '*positive perception about work environment will engender commitment*'.
2. Need satisfaction is positively and significantly related with affective, normative and overall organizational commitment. The relationship divulges that '*satisfaction causes commitment*'.
3. Effectiveness of supervision/management is positively and significantly related with overall organizational commitment and found to help in molding the positive perception about work environment and consequently feeling of loyalty.
4. While developing the prediction model social need, citizenship behaviour and recognition at work and work relations emerged as significant predictors. The percent of variance explained by social need satisfaction (65.11%) and citizenship behaviour and recognition at work and work relations (64.56%) in organizational commitment.

Based on findings, the following steps are being suggested to improve organizational commitment of Loco Pilots.

1. Favourable working conditions at work places act as a positive catalytic force in enhancing level of job-perfection which in turn upgrade physical outputs of employees. Satisfaction of Loco Pilots about working conditions is just average. Hence, improvement in this regard is necessary to boost up employee-outputs.
2. In a large organization like Indian Railways there may be many Loco Pilots having negative mind-sets. Loco Pilots mind set about working environment can be identified with the help of suitable psychometric tool, some of them have been discussed here. These people are required to be counseled by professional psychologists available at zonal railways with an effort to mould their attitude in positive directions. People at

higher/supervisor level need to review their own attitude about subordinates and work environment. Otherwise, the exercise of attitude molding of others would be futile.

3. A human touch in management is very much desirable, who is dealing with these Loco Pilots, they should feel that management is looking after them. Loco Pilots 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.*
4. Research on the basis of non-directive interview signifies that factors as mentioned here may enhance organizational commitment: Moderate level of freedom/independence/autonomy at work, Citizenship behaviour and recognition at work, work relations and satisfaction of social needs, Continuous review of employees' salaries to ensure that a fair and competitive pay is guaranteed by the organization at all times, Work tenure, length of service, Employee satisfaction with personal performance, perceived fair appraisals, fair dispersal of their dues, advances, etc., resources and equipment that employees need to be effective on their jobs, investment in training and development, high quality, supportive and friendly supervision, high level of responsibility at all levels, broad task design and teamwork, high employee morale, based on a climate of trust and co-operation, effective reward management, effective channel of communication, selection based on merit, not mediocrity or nepotism, career progress or job advancement with specific time frame, employee satisfaction derived from the non-work environment and activities, including health and physical condition

Organizational and Managerial Implications

While interpreting the path model, it should be taken into consideration that path analysis is not a method of discovering causal laws but a procedure for giving a quantitative interpretation of an assumed causal system as it operates within a given population.

These findings have practical implications for managers. Loco Pilots that have low intensity of organizational commitment, social needs satisfaction, citizenship behaviour and recognition at work and work relations may require different management styles and motivational strategies for optimum organizational effectiveness. The causal paradigm of variables may also be instructive for

human resource managers to study the organizational commitment of most critical workforce of Indian Railways. While this research has produced interesting results, predominantly all participants are the regular employees and had been with the organization for a long time. The present study gives the causal paradigm in predicting organizational commitment. An argument could be made to suggest that it was the multivariate technique discernment, which was applied in establishing the causal schema.

Limitations and Directions for Future Research

The limitation is that we only sampled India's first and Asian's second largest public sector transport organization. Therefore, our findings may not be generalizable to other transport sectors. To enhance external validity, future research efforts should obtain a representative sample from several transport sectors, ideally using a longitudinal research design to establish causal relationships among the variables.

Despite these limitations, our findings contribute to the extant literature by providing causal paradigm that organizational commitment is antecedent to need satisfaction and work environment, thereby supporting the findings of previous scholars (Bateman and Strasser, 1984). Therefore, our efforts represent the first attempt to study the organizational commitment in transport sector.

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