CHAPTER III

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3.0 INTRODUCTION

Burns and Grove (2003) define a research design as “a blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings”.

This study focuses on the mediating role of organizational citizenship behavior on HRM practices and individual outcomes among production engineers with special reference to Coimbatore city.

3.1 OBJECTIVES OF THE STUDY

1. To explore the impact of HRM practices (Retention-Oriented Compensation, Formalized training, Empowerment and Rewards and Recognition) over OCB of production engineers.

2. To examine the influence of OCB on the production engineer’s engagement level and Turnover intention.

3. To analyze the association between the demographic profiles with the production engineer’s engagement level and turnover intention.

4. To investigate the possibilities of OCB as a behavioral mediator of the relationship between HRM practices and engagement level and turnover intention.

5. Propose a model to evaluate the mediating role of OCB on HRM practices and individual outcomes (Engagement level and Turnover intention) among production engineers.

3.2 HYPOTHESES FORMULATED

H1: Retention-oriented compensation practices have a significant relationship with organizational citizenship behavior.

H2: Formalized training practices have a significant relationship with organizational citizenship behavior.

H3: Empowerment practices have a significant relationship with organizational citizenship behavior.

H4: Rewards and Recognition practices have a significant relationship with organizational citizenship behavior.
H5: Organizational citizenship behaviors have a significant relationship with production engineer’s turnover intention.

H6: Organizational citizenship behaviors have a significant relationship with production engineer’s engagement level.

H7: Organizational citizenship behavior mediates the relationship between HRM practices and production engineer’s turnover intention.

H8: Organizational citizenship behavior mediates the relationship between HRM practices and production engineer’s engagement level.

3.3 SOURCES OF DATA

3.3.1 PRIMARY DATA

In order to fulfill the objectives set out, a sample study was undertaken using well-framed questionnaires and got it duly filled in by employees. Respondents of varying nature were selected based on the important aspects of their Age, Education, Type of manufacturing organization working, Department, Designation, Years of experience in the present organization, Total experience, Income and so forth. A structured questionnaire was pre-tested and suitable modifications were carried out later.

3.3.2 SECONDARY DATA

The primary data were supplemented by enough secondary source data. The secondary data pertaining to the study were gathered from books, journals, internet and by utilizing the well-equipped libraries at Coimbatore and Chidambaram. They were utilized to get the necessary and the latest information required for the study. A number of standard textbooks were studied to obtain the pertinent literature on organizational citizenship behavior.

3.4 DISCUSSION AND INFORMAL INTERVIEWS

In order to know about human resource management practices in production sectors, organizational citizenship behavior and individual outcomes, several rounds of discussions were held with the experts in the respective field. For this purpose, good rapport had been established with the HR managers of selected industries, subject experts and research supervisor.
VALIDITY TEST AND CONSTRUCT DEVELOPMENT

The questionnaire was subjected to face and content validity whose determination was judgmental. The items to measure each construct of the study were taken from previous researchers which have already tested the items for validity. But still the items were subjected to face and content validity tests. The test was conducted with HR managers of various production sectors in Coimbatore district and subject experts. The interview schedule has been divided into five parts. The first part of the interview schedule deals with the demographic profile of the respondents. The second part deals with HRM practices (i.e.) Retention-oriented compensation (7 variables) adopted from Janet and Christopher\textsuperscript{134} (2008) and Wing Lam\textsuperscript{100} et al (2009), Training (6 variables) adopted from Wing Lam\textsuperscript{100} et al (2009) and Solha\textsuperscript{135} et al (2012), Empowerment (6 variables) adopted from Jeannette Taylor\textsuperscript{136} (2013), Lee\textsuperscript{137} et al (2000), Asim mukhtar\textsuperscript{56} et al (2012) and Paula\textsuperscript{138} et al (1992) and Rewards and recognition (7 variables) adopted from Alan\textsuperscript{116} Saks (2006) and Yi-chun yung\textsuperscript{70} (2012). The third part deals with the OCB dimensions (i.e.) Conscientiousness (5 variables) adopted from solha\textsuperscript{135} et al (2012) and Asim mukhtar\textsuperscript{56} et al (2012), Altruism (5 variables) adopted from Solha\textsuperscript{135} et al (2102) and Asim mukhtar\textsuperscript{56} et al (2012), Team building (5 variables) adopted from solha\textsuperscript{135} et al (2012) and Piercy\textsuperscript{13} et al (2006) and Loyalty (5 variables) Caryl\textsuperscript{139} et al (1988) and Solha\textsuperscript{135} et al (2012). The fourth and fifth part of the questionnaire measured the production engineer’s engagement level (4 variables) Wilmar\textsuperscript{140} et al (2002) and Turnover intention (3 variables) Farh\textsuperscript{141} et al (1998). All the variables taken up for the consideration in this study were measured with 5 point likert scale with the range of 1 – Strongly disagree to 5 – Strongly agree.

SAMPLING FRAME

The sampling frame was consisted of manufacturing companies registered in the registrar of companies (Roc), Coimbatore. There were 124 manufacturing companies which were further narrowed down to 55 companies based on the criteria that the company should have more than 200 employees and the annual turnover should be more than 15 crores.

SAMPLING PROCEDURE

The primary objective of this study is evaluating the mediating role of OCB on HRM practices and individual outcomes among production engineers especially working in research and development, product and design and quality checking departments from
various manufacturing industries such as auto components, textile machineries, home appliances and electric and motor pumps in Coimbatore district of Tamilnadu. A total of 430 respondents were considered and purposive sampling was used to assess the opinions of production engineers regarding HRM practices, OCB, Engagement level and Turnover intention. Out of the above, 408 questionnaires were returned and found to be in reusable level resulting in a response rate of 95%. Data collected through the questionnaire has been analyzed to fulfill the objectives of the study.

Table – 3.7.1

Classification of the respondents on the basis of type of industry

<table>
<thead>
<tr>
<th>SNO</th>
<th>TYPE OF INDUSTRY</th>
<th>NUMBER OF RESPONDENTS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Textile machine manufacturing sector</td>
<td>102</td>
<td>25%</td>
</tr>
<tr>
<td>2</td>
<td>Electric and motor pumps manufacturing sector</td>
<td>102</td>
<td>25%</td>
</tr>
<tr>
<td>3</td>
<td>Auto components manufacturing sector</td>
<td>102</td>
<td>25%</td>
</tr>
<tr>
<td>4</td>
<td>Home appliances manufacturing sector</td>
<td>102</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>408</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

3.8 PILOT STUDY

As the items were drawn from several scales, a pilot study was carried out to ensure that each subscale was internally consistent. For this purpose data collected from the sample of 100 production engineers were tested using cronbach’s alpha methods.

3.8.1 Cronbach’s Alpha

Cronbach's alpha is a measure of internal consistency and scale reliability. It can be written as a function of the number of test items and the average inter-correlation among the items.
Here N is equal to the number of items, c-bar is the average inter-item covariance among the items and v-bar equals the average variance.

3.8.2 Interpretation of Reliability Co-efficient

The reliability analysis showed that the internal consistency estimated (Cronbach’s Alpha) for the 10 scales of the study ranged from 0.67 to 0.86. The results of the same are reported in table 3.8.1.

<table>
<thead>
<tr>
<th>SNO</th>
<th>CONSTRUCTS</th>
<th>CRONBACH’S ALPHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Altruism</td>
<td>0.71</td>
</tr>
<tr>
<td>2</td>
<td>Conscientiousness</td>
<td>0.73</td>
</tr>
<tr>
<td>3</td>
<td>Team Building</td>
<td>0.71</td>
</tr>
<tr>
<td>4</td>
<td>Loyalty</td>
<td>0.72</td>
</tr>
<tr>
<td>5</td>
<td>Retention-oriented compensation</td>
<td>0.77</td>
</tr>
<tr>
<td>6</td>
<td>Formalized training</td>
<td>0.85</td>
</tr>
<tr>
<td>7</td>
<td>Empowerment</td>
<td>0.78</td>
</tr>
<tr>
<td>8</td>
<td>Rewards and Recognition</td>
<td>0.81</td>
</tr>
<tr>
<td>9</td>
<td>Employee engagement</td>
<td>0.67</td>
</tr>
<tr>
<td>10</td>
<td>Turnover intention</td>
<td>0.86</td>
</tr>
</tbody>
</table>

3.8.3 ITEM ANALYSIS

Item analysis is used by the researcher to determine the selection of items in the questionnaire. The objective of this analysis is to reveal the set of items having the strongest possible relationship to the construct. The inspection of the item-to-total correlation showed that all items were correlated highly with their own totals except 4 items which were dropped out for further analysis (1 item from each of training, empowerment, engagement and turnover intention).
3.9 FRAMEWORK OF ANALYSIS

In order to analyze the data collected from the production engineers, the appropriate statistical tools have been selected on the basis of the objectives of this study and the nature of data. The included statistical analyses are:

1. Simple percentage analysis
2. Analysis of Variance
3. Post-hoc method
4. Inter-correlation analysis
5. Hierarchical regression analysis
6. Baron and Kenney’s three step hierarchical regression model to test the mediation of organizational citizenship behavior.

3.9.1 Simple Percentage Analysis

It refers to a ratio with the help of the absolute figures. It will be difficult to interpret any meaning from the collected data, but when percentage are found out then it becomes easy to find the relative difference between two or more attributes.

\[
Percentage = \frac{No\ of\ Respondents}{Total\ No\ of\ Respondents} \times 100
\]

The simple percentage analysis is generally used in the study relating to the social science researches which are helpful to assess the distribution of the respondents under each classification. As it is expressed in percentage it facilitates comparison. The various demographic variables used in this analysis are

- Age
- Gender
- Marital Status
- Educational Background
- Type of manufacturing organization working
- Number of Years of Experience in the present organization
- Total experience
- Monthly Salary
3.9.2 Analysis of Variance

Analysis of variance (ANOVA) is a collection of statistical models used to analyze the differences between group means and their associated procedures (such as "variation" among and between groups), developed by R.A. Fisher. In the ANOVA setting, the observed variance in a particular variable is partitioned into components attributable to different sources of variation. In its simplest form, ANOVA provides a statistical test of whether or not the means of several groups are equal, and therefore generalizes the t-test to more than two groups.

• Notation in one-way ANOVA:

\( k = \text{number of populations} \)
\( n = \text{total number of observations} \)
\( x = \text{mean of all } n \text{ observations} \)
\( n_j = \text{size of sample from Population } j \)
\( x_j = \text{mean of sample from Population } j \)
\( s^2_j = \text{variance of sample from Population } j \)
\( T_j = \text{sum of sample data from Population } j \)

• Defining formulas for sums of squares in one-way ANOVA:

\( \text{SST} = (x - x)^2 \)
\( \text{SSTR} = n_j (x_j - x)^2 \)
\( \text{SSE} = (n_j - 1)s^2_j \)

• One-way ANOVA identity:

\( \text{SST} = \text{SSTR} + \text{SSE} \)

• Computing formulas for sums of squares in one-way ANOVA:

\( \text{SST} = x^2 - (x)^2/n \)
\( \text{SSTR} = (T^2_j / n_j) - (x)^2/n \)
SSE = SST - SSTR

• Mean squares in one-way ANOVA:

\[
\text{MSTR} = \frac{\text{SSTR}}{k - 1}
\]

\[
\text{MSE} = \frac{\text{SSE}}{n - k}
\]

• Test statistic for one-way ANOVA (independent samples, normal populations, and equal population standard deviations):

\[
F = \frac{\text{MSTR}}{\text{MSE}}
\]

with df = (k - 1, n - k).

The various variables used in this analysis are

- Age
- Education
- Income
- Number of years of experience in the current organization
- Total experience
- Employee engagement
- Turnover intention

3.9.3 Post-Hoc Method

Tukey's post-hoc test is a method that is used to determine which groups among the sample have significant differences. This method calculates the difference between the means of all the groups. Tukey's HSD test values are number which acts as a distance between the groups. It works by defining a value known as Honest Significant Difference.

Formula:

\[
\frac{M_1 - M_2}{\sqrt{M \cdot \frac{1}{n}}}
\]
3.9.4 Inter-correlation Analysis

The inter-correlations among the predictors are useful for identifying multi-collinearity in the regression. Variables that are highly correlated will lead to unstable regression estimates. However, due to their high correlation, omitting one of them from the model only minimally affects prediction. The variance in the response that can be explained by the omitted variable is still explained by the remaining correlated variable. However, zero-order correlations are sensitive to outliers and also cannot identify multi-collinearity due to a high correlation between a predictor and a combination of other predictors.

The various variables used in this analysis are

- Retention – oriented compensation
- Formalized training
- Empowerment
- Rewards and recognition
- Altruism
- Conscientiousness
- Team building
- Loyalty
- Employee engagement
- Turnover intention

3.9.5 Hierarchical Regression Analysis

Hierarchical regression is used to evaluate the relationship between a set of independent variables and the dependent variable, controlling for or taking into account the impact of a different set of independent variables on the dependent variable. In hierarchical regression, the independent variables are entered into the analysis in a sequence of blocks, or groups that may contain one or more variables.

\[ Y_{ij} = \beta_0 + \beta_1(X_{ij}) + \epsilon_{ij} \]
Yij refers to the score on the dependent variable for an individual observation at Level 1 (subscript i refers to individual case, subscript j refers to the group).

Xij refers to the Level 1 predictor.

β0j refers to the intercept of the dependent variable in group j (Level 2).

β1j refers to the slope for the relationship in group j (Level 2) between the Level 1 predictor and the dependent variable.

eij refers to the random errors of prediction for the Level 1 equation (it is also sometimes referred to as rij). At Level 1, both the intercepts and slopes in the groups can be either fixed (meaning that all groups have the same values, although in the real world this would be a rare occurrence), non-randomly varying (meaning that the intercepts and/or slopes are predictable from an independent variable at Level 2), or randomly varying (meaning that the intercepts and/or slopes are different in the different groups, and that each have their own overall mean and variance).

The dependent variables are the intercepts and the slopes for the independent variables at Level 1 in the groups of Level 2.

\[
\begin{align*}
\beta_0j &= \gamma_{00} + \gamma_{01}W_j + u_{0j} \\
\beta_1j &= \gamma_{10} + u_{1j}
\end{align*}
\]

γ00 refers to the overall intercept. This is the grand mean of the scores on the dependent variable across all the groups when all the predictors are equal to 0.

Wj refers to the Level 2 predictor.

γ01 refers to the overall regression coefficient, or the slope, between the dependent variable and the Level 2 predictor.

u0j refers to the random error component for the deviation of the intercept of a group from the overall intercept.

γ10 refers to the overall regression coefficient, or the slope, between the dependent variable and the Level 1 predictor.

u1j refers to the error component for the slope (meaning the deviation of the group slopes from the overall slope).
3.9.6 Baron and Kenney’s Three Step Hierarchical Regression Model

In statistics, a mediation model is one that seeks to identify and explicate the mechanism or process that underlies an observed relationship between an independent variable and a dependent variable via the inclusion of a third explanatory variable, known as a mediator variable. Rather than hypothesizing a direct causal relationship between the independent variable and the dependent variable, a meditational model hypothesizes that the independent variable influences the mediator variable, which in turn influences the dependent variable. Thus, the mediator variable serves to clarify the nature of the relationship between the independent and dependent variables. In other words, mediating relationships occur when a third variable plays an important role in governing the relationship between the other two variables.

Baron and Kenny laid out several requirements that must be met to form a true mediation relationship. They are outlined below using a real world example. Diagram 3.9.1 is a visual representation of the overall mediating relationship to be explained.

**Diagram 3.9.1: Three step regression model of Baron and Kenney.**

Baron and Kenny laid out several requirements that must be met to form a true mediation relationship. They are outlined below using a real world example. Diagram 3.9.1 is a visual representation of the overall mediating relationship to be explained.

**Step 1:**

Regress the dependent variable on the independent variable. In other words, confirm that the independent variable is a significant predictor of the dependent variable.

\[ Y = \beta_{10} + \beta_{11} X + \epsilon_1 \]

\[ \beta_{11} \text{ is significant} \]
Step 2:

Regress the mediator on the independent variable. In other words, confirm that the independent variable is a significant predictor of the mediator. If the mediator is not associated with the independent variable, then it couldn’t possibly mediate anything.

\[
M_e = \beta_{20} + \beta_{21}X + \epsilon_2
\]

\(\beta_{21}\) is significant

Step 3:

Regress the dependent variable on both the mediator and independent variable. In other words, confirm that the mediator is a significant predictor of the dependent variable, while controlling for the independent variable.

This step involves demonstrating that when the mediator and the independent variable are used simultaneously to predict the dependent variable, the previously significant path between the independent and dependent variable (Step #1) is now greatly reduced, if not not significant.

\[
Y = \beta_{30} + \beta_{31}X + \beta_{32}M_e + \epsilon_3
\]

\(\beta_{32}\) is significant and \(\beta_{31}\) should be smaller in absolute value than the original mediation effect (\(\beta_{11}\) above).

3.10 PERIOD OF THE STUDY

The study was conducted for the period of three years from 2011 to 2014. Initially, the related research information was collected and to frame the relevant questionnaire, it had taken fifteen months. Then, the pilot study was conducted and altered questionnaire based on the pretest results had taken two month. Third, the primary data was collected for seven months. Followed by the primary information through questionnaire, the secondary information were collected from websites, academic books, previous research thesis, journals, university libraries and magazines for a period of five months. Then the collected primary
information was processed and the data analysis work had taken five months. With the complete interpretation the entire study has been finalized within three months.

3.11 LIMITATIONS OF THE STUDY

The present study has three major limitations which should be focused in future study. First, the study was limited to production engineers along with relatively small sample size which was preferred through purposive sampling method confined with small geographic region. Second, since the data was collected from a few production sectors located in Coimbatore District, we may not know the generalizability of the findings. Bias on the part of employees while answering to the question is yet another limitation.