3. METHODOLOGY

3.1 Measures

Established scales were used for capturing the variables as they provide advantages of validity. The following scales were chosen because they were the most frequently used scales used for capturing the relevant constructs in recent studies. The variables of psychological meaningfulness and perceived organisational support were captured using the six-item scales developed by May et al. (2004) and Eisenberger et al. (1986) respectively. The variable of workplace ostracism was captured by the ten-item scale developed by Ferris et al. (2008). The moderating variable of role ambiguity was captured by the eight-item scale developed by Rizzo et al. (1970). The other moderating variable was work experience at the current workplace.

The dependent variable of work engagement was captured by the seventeen-item Utrecht Work Engagement Scale (UWES) developed by Schaufeli and Bakker (2003). These scales were used as they were the most frequently used scales in the recent studies concerning the relevant variables.

The gender and age of the individuals were used as control variables. They were used as control variables as they may have a confounding influence on work engagement. Previous studies have noted the positive association of age and gender with work engagement. Schaufeli and Salanova (2007) found that age had a positive relationship with work engagement, while gender was found to be related to higher work engagement (Kinnunen, Feldt, & Mäkikangas, 2008).

3.2 Pilot Study

The importance of a pilot study was heightened by De Vaus (1993). He advised “Do not take the risk. Pilot study first” (De Vaus, 1993, p. 54). Conducting a pilot study confers some advantages on the researcher. Pilot study is helpful in testing the adequacy of the research
instrument and in assessing the feasibility of a full scale study. It also gives advance warning as to whether the proposed methods are inappropriate or too complicated (van Teijlingen & Hundley, 2002).

A pilot study was done before the main study. The respondents for the study were university teachers and Ph.D. scholars. The sample was comprised of teachers as the study of their work engagement is very significant for the society (Furrer, Skinner, & Pitzer, 2014). The total number of respondents was 50, out of these the number of male respondents was 27. The range of age of the respondents was from 22 years to 63 years and the range of their experience in their current workplace was from 2.5 months to 43 years.

The pilot study was helpful in the preparation for the main study in many ways. It provided an opportunity to check whether the items on the questionnaire were worded in a way so as to convey the correct and clear meaning. Some (difficult) words were replaced in consultation with the subject experts and some sentences were restructured to increase their clarity. It was found that a seven point Likert scale may be preferable to a five point Likert scale. The pilot study was instrumental in testing the reliability of the scales, simplifying the instrument wherever required, and checking the time required to fill the questionnaire.

**Cover letter**

The instrument i.e. the questionnaire was accompanied by a cover letter. It introduced the researcher and the purpose of the data collection. The cover letter assured the potential respondents of their responses being kept confidential and anonymous. It also informed them that the collective data (not the individual data) might be used in research publications. The expected time required to fill the questionnaire was specified. The contact details of the researcher were shared within the cover letter so that any concerns (if any) of the respondents might be assuaged.
The scales used for the pilot study and their reliabilities are shown in the following table.

**Table 3.1 Scales used and their reliabilities**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Construct</th>
<th>Scale</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Work Engagement</td>
<td>Schaufeli and Bakker (2003)</td>
<td>0.96</td>
</tr>
<tr>
<td>2.</td>
<td>Workplace Ostracism</td>
<td>Ferris <em>et al.</em> (2008)</td>
<td>0.83</td>
</tr>
<tr>
<td>3.</td>
<td>Psychological Meaningfulness</td>
<td>May <em>et al.</em> (2004)</td>
<td>0.96</td>
</tr>
<tr>
<td>4.</td>
<td>Perceived Organizational Support</td>
<td>Eisenberger <em>et al.</em> (1986)</td>
<td>0.91</td>
</tr>
<tr>
<td>5.</td>
<td>Role Ambiguity</td>
<td>Rizzo <em>et al.</em> (1970)</td>
<td>0.92</td>
</tr>
</tbody>
</table>

### 3.3 Main Study

#### 3.3.1 Data and Sample

For the main study, the data was collected from teachers of universities and colleges located in north and central India. The types of universities and colleges were private, government as well as autonomous. The designations of the respondents were Lecturer, Assistant Professor, Associate Professor, and Professor. Out of the final sample of 326 respondents, 140 were male and the rest 186 were female. The range of age of the respondents was from 25 years to 67 years. The range of the work experience in the current workplace was from 0.5 years to 40 years. We focused on teachers for a specific reason. Engagement of teachers with their work is very significant for the society. This is so because the teachers are responsible to a large extent for shaping minds of the youth of the society (Furrer, Skinner, & Pitzer, 2014). Their engagement is thus immensely significant in a developing country like India. Analysing the factors that may influence their engagement assumes a great significance in view of this perspective.

In order to reduce the common method bias in the collection of data, a temporal gap was given between collection of independent and the dependent variables (Podsakoff, Mackenzie, Lee, & Podsakoff, 2003). Wu, Yim, Kwan, and Zhang (2012) gave a temporal gap of four months. Liu *et al.* (2013) gave a temporal gap of three months. Fiset, Al Hajj, and
Vongas (2015) gave a temporal gap of one week while Wu, Kwan, Liu, and Lee (2015) gave a temporal gap of one and a half years. After consultation with experts, we decided to give a temporal gap of about a month. We used the thumb rule of 1:6 for calculating the minimum sample size i.e. the sample size should be 6 times the number of items in the questionnaire.

The data was collected in two phases; in the first phase data on workplace ostracism, role ambiguity, psychological meaningfulness, perceived organizational support and work experience in the current workplace was collected. After a gap of 35 days data pertaining to work engagement, gender and age of the participants was collected. In the first phase data was collected from 510 individuals, however only 326 individuals out of these gave data for the second phase. Out of the final sample of 326, 140 participants were male and the rest were female.

Same source bias is a problem in data collection when the data on the independent and the dependent variable is collected from the same person at the same instant of time. This is a major cause of concern in cross-sectional research. The implication of the same source bias is that we may find some spurious covariance between the predictor and criterion variable which is produced by the fact that the respondent providing the measure of these variables is the same.

However, the same source bias did not affect the data collected for this study as a temporal gap of 35 days was given between the collection of the independent and the dependent variables (Podsakoff et al., 2012).

The data was collected during the months of August and September. The same academic session was going on during these months and no significant event happened during the intervening period which could have affected the dependent variable.
3.3.2 Rationale for using structural equation modeling

Correlations, regressions, or difference of means tests (e.g., ANOVA or t-tests) are 1G (first generation) statistical techniques. They cannot handle latent variables and indirect effects (mediation). Structural Equation Modeling (SEM) is 2G (second generation) statistical techniques which can be used for modeling causal networks of effects in one go rather than doing them one at a time as in the case of 1G techniques. 2G techniques do not, however, invalidate the need for 1G techniques.

SEM has the ability to handle latent (unobserved) variables. SEM permits the estimation of the complete model at the same time. In contrast, the 1G techniques enable the estimation of only one proposed relation at a time. Thus, it becomes impossible to test for mediation directly with the help of 1G techniques. Testing the relationships, one at a time, may lead to inflated t-statistics thereby increasing the chances of Type I error (false positives). Further, this piecemeal testing increases the chances of Type II error (false negative) by decreasing the potential of the R² statistic to accurately account for the overall variation in the model. “It is possible in regression, for example, to misinterpret the underlying causality in that no single run can parse out all the variance in complex research models” (Gefen, Straub, & Boudreau, 2000, p. 17).

In SEM the proposed relations between the independent and the dependent variables are symbolized through paths. There is a path for every proposed relation; a path being depicted as an arrow in the proposed direction of causation (Hair, Black, Babin, Anderson, & Tatham, 2006). The technique enables the researcher to estimate the relationship between latent variables which are unobservable (Chin, 1998). These characteristics are significant as these help in constructing theories depicting real-life situations which are often multi-stage relationships. These phenomena of interest often “occur in a complex network of causal links” (Hage & Meeker, 1987, p. 33).
3.3.3 Rationale for using PLS-SEM

Covariance based (CB-SEM) and least squares based (PLS-SEM) are the two forms of SEM. PLS-SEM is beneficial as compared to 1G techniques and CB-SEM techniques for theory building, whereas CB-SEM scores over PLS for model validation.

As PLS-SEM is more adept at handling measurement error in comparison with CB-SEM, it is more sensitive to moderator effects, consequently decreasing the required sample size (Chin, Marcolin, & Newsted, 2003). Another characteristic problem that one may encounter while using CB-SEM is that it cannot handle the complexity that arises with the increased number of indicators while using interaction variables as moderators.

Whether one uses CB-SEM or PLS-SEM depends on the kind of research being undertaken. If one is carrying out confirmatory research the CB-SEM technique used while PLS-SEM is a technique used for exploratory research. Since we are doing an exploratory work (exploring the possible mediation effects of workplace ostracism), we chose PLS-SEM.

3.4 Mediation Analysis

Mediation focuses on a theoretically established direct path relationship (i.e. path $p_{13}$ in the figure below) between $Y_1$ and $Y_3$, as well as on an additional theoretically relevant component $Y_2$, which indirectly provides information on the direct effect via its indirect effect (i.e. $p_{12} p_{23}$) from $Y_1$ to $Y_3$ though $Y_2$ (figure below). Thereby, the direct relationship from $Y_1$ to $Y_3$ in the mediator model is affected by the indirect relationship via the $Y_2$ mediator.
Technically, a variable functions as a mediator when it fulfils the conditions mentioned below (Baron & Kenny, 1986):

1. A significant amount of variance in the presumed mediator is accounted for by the variance in the independent variable (i.e. path $p_{12}$ in the above figure).
2. A significant amount of variance in the dependent variable is accounted for by the variance in the mediator (i.e. path $p_{23}$ in the above figure).
3. On controlling for the paths $p_{12}$ and $p_{23}$, the relation between the independent and dependent variables (i.e. path $p_{13}$ in the above figure) which was found to be significant before the introduction of mediator, undergoes a significant change.

Consequently, empirical tests must answer the following questions:

1. Is $p_{13}$ (direct effect) significant when the mediator is excluded?
2. Is the path $p_{12}.p_{23}$ (indirect effect) significant?
3. What is the amount of the direct effect captured by the indirect effect?

For testing mediation effects, we follow the approach suggested by Preacher and Hayes (2004, 2008). To begin with, path $p_{13}$ (direct effect) should be significant, when the mediator is not taken into consideration. Even though this is not a necessary condition (Zhao, Lynch, & Chen, 2010), this kind of situation makes the mediator analysis much easier to
understand and interpret. The significance test is conducted by carrying out the bootstrapping procedure. If this relationship is significant, this effect or the entire effect may be absorbed by the mediator. Hence, we continue the mediator analysis if there is a significant direct path relationship between the exogenous and endogenous latent variables and include the mediator construct in the PLS path model.

When including the mediator, the indirect effect (i.e. $p_{12}.p_{23}$) must be significant. A pre-requisite for this condition is that each of the individual paths $p_{12}$ and $p_{23}$ are themselves significant. Only if the paths turn out to be significant after the bootstrapping procedure has been run can we assess if their product, which represents the indirect effect, is significant. The mediator captures some of the direct effect when the indirect effect is significant. For example, in a PLS path model without the mediator variable, a positive direct effect (i.e. path $p_{13}$) would become smaller after the inclusion of the mediator variable. The point to be considered is the extent to which the mediator variable absorbs it.

The variance accounted for (VAF) is the proportion of the indirect effect in relation to the total effect (i.e. direct effect + indirect effect): $VAF = (p_{12}.p_{23}) / (p_{12}.p_{23} + p_{13})$. Thereby, we can determine the variance in the dependent variable accounted for directly by the independent variable vis-à-vis the variance accounted for indirectly by the mediator. The rules linking the value of VAF to the level of mediation (Hair et al., 2014) are:

- $VAF < 20\% \rightarrow$ No mediation
- $20\% < VAF < 80\% \rightarrow$ Partial mediation
- $VAF > 80\% \rightarrow$ Full mediation