# CHAPTER III: METHOD

Chapter III describes the research design, including an overview of the procedures for participant selection, instruments and measures, data collection, and data analysis. The research questions that guided the design of the study are: (1) Within the organization, how does physical proximity to others in the workplace relate to the amount of communication received from and sent to others through the selected channels, for specified employment levels? (2) Within the organization, how does the amount of e-mail communication received from and sent to others, and the physical proximity to others, relate to organizational trust and psychological sense of community in the workplace for specified employment levels? (a) What is the relationship between e-mail communication and organizational trust? (b) What is the relationship between e-mail communication and psychological sense of community in the workplace? Of course, individual characteristics and organizational environment could be important too.

## III.1   Participants

Professional, white-collar employees from a large international organization were the population that met the criteria for this study. The selected organization is composed of approximately 12,000 employees located in offices on six continents. Client-service oriented, this organization serves both the public and private sectors. Approximately 80 percent (about 9,600 employees) of the employees work on public sector projects, while the remaining 20 percent (about 2,400) work primarily on projects within the private sector. Selected teams from the public sector business segment comprised the sample for this study.

The public sector business segment is divided into three operational teams. Employees have one designated "home team;" however, because of the matrix structure of the organization, employees may work on multiple projects across the various operational teams. Most of the projects are temporary in nature, requiring organizational members, who may or may not know each other and are selected based on the needed skill sets for each project, to work together for various time durations. Employees often work with organizational members from different locations, relying on electronic mail to communicate with other project team members. In addition, employees are often required to work at client locations for an extended period of time. During their tenure on remote assignments, employees are often physically separated from their

supervisors and colleagues. Typically, the primary vehicle for communicating with their immediate supervisor, and connecting with the larger organization, is through electronic mail.

This research focused on white-collar professionals within a networked organization. Given that all three operational teams within the selected organization function primarily in the same manner, responses were elicited from employees across the public sector business segment within selected teams. Participants were asked to complete survey instruments addressing organizational trust, psychological sense of community in the workplace, and the use of selected communication channels. A total of 812 questionnaires were distributed, and 351 were returned, a 43 percent return rate.

## III.2    Instrumentation

Three measures were selected for this study based on their relationship to the theoretical arena and the nature of the research questions (see Table III-1). Two additional questions were developed to obtain information on work location and physical proximity to others in the workplace. Two open-ended questions were added to the questionnaire to allow participants to share their personal experiences with e-mail communication and their perception of its influence on trust and psychological sense of community in the work environment. The two open-ended questions were used solely for observational interest and to identify future research opportunities. The responses from these items were not used to address the research questions.

The following subsections highlight the instruments that were used in the study.

### III.2.1        *Trust*

Based on the interpersonal relationships that influence organizational effectiveness within the work environment, Scott (1981) developed four trust measures: (a) trust in immediate supervisor, (b) trust in peer group or work unit, (c) trust in top management, and, (d) trust in the management development consultant. Adapting items from other trust scales, Scott developed items for each trust relationship. The original trust scale was reviewed by trust scholars, resulting in a 29-item questionnaire that was subjected to a factor analysis (varimax extraction and orthogonal rotation) to evaluate the four factor dimensionality and item structure.

Three times over a 6-month period, Scott administered the trust measures using the 29-item questionnaire for the initial administration of the trust measures. After the initial administration, several items were eliminated, resulting in a 17-item measure. The elimination of items altered the original Cronbach alpha by less than .3 percent, and a factor analysis revealed that items were appropriately assigned to one of the four measures. The revised questionnaire was administered two more times, and the results of t-tests from all three data sets revealed no significant differences between mean scores of trust in supervisor, peers, and management across time. These results indicate a strong reliability for the survey instrument. Scott (1981) found that the trust measures were "consistent with the conceptual framework of trust, internally consistent, identify different trust variables, and stable over time" (p. 108-109).

As was done by Ruder (2003), only two of the four trust measures were used in this study. These two measures of Scott's (1981) trust scale—trust in the immediate supervisor, hereafter referred to as "trust in supervisor," and trust in top management, hereafter referred to as "trust in organization"—focus on trust at an organizational level (Ruder, 2003) and were deemed appropriate for this study. Five-items measured the perceived trust an employee has regarding his or her supervisor, and four-items measured the perceived trust an employee has in his or her organization. Scott's factor analysis of the items in these two trust measures revealed two factors with an eigenvalue of approximately 1.0 or greater. Based on the three administrations of the trust measures, he found the Cronbach alphas were .91, .77, and .80 for trust in organization, and .82, .77, and .86 for trust in supervisor. Recent use of these two measures resulted in Cronbach alpha scores of .71 for trust in organization, and .93 for trust in supervisor (Ruder, 2003). As with Scott and Ruder, a five-point Likert-type scale (1 = strongly disagree to 5 = strongly agree) was employed for the trust measures. Trust items were written in a positive direction for analysis purposes.

### III.2.2    *Psychological Sense of Community in the Workplace*

Chipuer and Pretty (1999) reported that the Sense of Community Index (SCI) is the "most used and broadly validated measure of a Sense of Community (SOC)" (p. 646). The SCI consists of 12 true/false items measuring psychological sense of community in the neighborhood, but has been adapted in recent years to measure sense of community in the workplace (Pretty and

McCarthy, 1991). For this study, the original scale was modified from true/false to a five-point Likert-type response (1 = strongly disagree to 5 = strongly agree), to allow items related to community to be measured on the same ordinal scales as the trust items. As with the trust measures, all questions on the SCI were written in a positive direction for analysis purposes. The actual items on the SCI did not need to be altered to fit this modified scale.

The internal consistency of the total scale has been reported to range in Cronbach alphas from .71 to .80 (Chipuer and Pretty, 1999). The reliability coefficient from test-retest correlation has been reported as .71 and .80 (Pretty and McCarthy, 1991). A Kaiser-Meyer-Olkin (KMO) index (measure of sampling adequacy) of .83 emerged for the workplace data. Evidence of its construct validity was reported by Pretty (1990), McCarthy, Pretty, and Catano (1990), and Perkins, Florin, Wandersman, and Chavis (1990).

Pretty and McCarthy used the SCI to explore differences in SOC among men and women (managers and non-managers) in corporations. Their study revealed gender differences in the source of support and in the relative importance of each subscale. For instance, support from others was the primary predictor of sense of community for managers. However, the source of this support differed between men and women. Sense of community among men was related to peer cohesion, while women's related to supervisor support. Pretty and McCarthy also found that male managers had been employed at the company longer than their female colleagues and reported significantly higher sense of community. Male and female managers' perception of involvement was the second predictor of their sense of community. While the perception of work pressure was equal for male and female managers, it resulted in a negative relationship to women's sense of community and a positive relationship to men's. Their study resulted in a Cronbach alpha of .69.

### III.2.3 *Human Presence in Communication*

The International Communication Association Audit (ICA Audit) was developed to assess employees' perceptions of communication processes in their organization. The complete ICA Audit questionnaire contains 122 questions divided into eight major sections: (a) amount of information desired and actually received about a series of work related topics, (b) amount of information desired and actually sent about a series of work related topics, (c) amount of follow-

up by people now and amount needed, (d) amount of information received and desired from sources of information, (e) timeliness of information, (f) organizational communication relationship, (g) satisfaction with organizational outcomes, and (h) amount of information received and desired from channels of information. The audit has been used extensively in research and consulting in the years since its development.

The ICA Audit has consistently received high internal reliability scores. DeWine and Pearson (1985a) reported coefficient alphas for the relationship scale averaged .90 and those for the organizational outcomes scale averaged .76. The specific scales for the proposed study have equally strong reliability coefficient alphas (Information Received scale $\alpha$ = .89; Information Sent scale $\alpha$ = .81; and, Sources scale $\alpha$ = .79). The testing of the ICA Audit validity was conducted by measuring various scales against outcome variables. The correlation results of the communication variables reflect solid validity (Information Received = -.69; Information Sent = -.56; and, Sources = -.63).

The first two scales of the ICA Audit questionnaire, Information Received and Information Sent, were used to elicit responses regarding the amount of communication received and sent by organizational members from the four selected channels (i.e., face-to-face, telephone, paper, and e-mail). A five-point Likert-type scale (1 = very little to 5 = very great) was used. The fourth scale of the ICA Audit, Sources, was integrated with the first two scales to identify the various types of employees that received information from and sent information to others. Integrated with the communication channel items, the responses to these questions identified how specified levels in the organization (e.g., staff, management, and top management) communicate with others (i.e., colleagues, other colleagues, immediate supervisor, and top management) in the organization through the specified channels.

Two additional, open-ended questions were included in the questionnaire. These questions allowed participants to provide specific information regarding the use of e-mail communication and its relationship to trust and psychological sense of community. The responses from these questions were not used to answer the research questions—rather, the responses to these questions were used to pull key themes and observations from the data set.

### III.2.4  *Physical Proximity to Others and Work Location*

Two questions were developed to assess participants' primary work location and their physical proximity to others in the workplace. Participants were asked to identify their primary work location from six choices. These six choices were developed based on general knowledge of the work environment, and responses range from working at the organizational headquarters 5 days a week to 0 days per week. Using the same list of people in the organization as provided in the ICA Audit (i.e., colleagues, other colleagues, immediate supervisor, and top management), participants were asked to identified their physical proximity in relation to these individuals in the workplace on a five-point scale (1 = Very Close; 2 = Close; 3 = Some Close/Distant; 4 = Distant; 5 = Very Distant). A definition of each point on the scale was provided for participants responding to the questionnaire. These questions, in conjunction with the ICA Audit, provided insight into what channels employees use to communicate with one another given their physical proximity to others in the workplace.

Table III-1

*List of Measures in this Study*

| Author | Measure | Subscales | No.# of Items | Cronbach's alpha |
|---|---|---|---|---|
| Scott (1981) | Trust | Supervisor | 5 | $\alpha = .71$ |
| | | Organization | 4 | $\alpha = .93$ |
| McMillan and Chavis (1986) | Psychological Sense of Community | Subscales were not used to analyze the data for this research | 12 | $\alpha = .69$ |

### III.2.5  *Demographic Data*

Demographic data was collected on the last page of the questionnaire. These data elicited information such as gender, age, time with organization, organization level, and education. The demographic data helped develop a general composition of the population.

Most responses were numerically coded for further analysis and comparison of the data gathered for the study. The gender categorical variable was treated as if it were intervals by numerically coding male as 1 and female as 2. Respondents typed in their age information in years. Information regarding time in the organization was gathered by asking respondents to type in the number of years and months they had worked in the organization. Level in the organization was obtained by asking respondents to identify their position in the organization. These data were recoded and placed into three categories for analysis purposes: staff = 1, management = 2, and top management = 3. Information regarding education was gathered by asking respondents to identify the highest level of education achieved to date from high school to doctorate. These data were numerically coded and later recoded into two categories.

### III.3 Data Collection Procedures

Study participants were professional, white-collar employees from any one of the three operational teams within the public sector business segment of the selected organization. Respondents included staff, management, and top management positions. Because of the work environment and the dispersed population, the data was collected through an electronic questionnaire. Participants received an introductory e-mail from each of the operational team leaders that explained the intent of the study, use of the data collected, and the confidentiality agreement. The introductory e-mail also provided participants with an approximate date for distribution of the questionnaire and a specific deadline for completion. Several days following their receipt of the introductory e-mail, participants received another e-mail message from their respective organizational leadership with a link to the dissertation questionnaire. The link contained an introductory letter with specific information about the study, an informed consent document that explained participant's rights and responsibilities, and the dissertation questionnaire. Participants were given 3 weeks to complete the questionnaire. Approximately mid-way through the time period to complete the questionnaire, a reminder e-mail message was sent out to participants. Each participant freely elected to provide responses for this study, and participants were able to end their involvement at any time during the study without penalty.

The questionnaire data was collected and automatically entered into a Microsoft EXCEL spreadsheet. The spreadsheet was transferred to a data set for use in Statistical Package for the

Social Sciences (SPSS) for Windows, Version 11.5 to conduct the analyses for this research. Confidentiality was maintained because no information was revealed about the identity of participants and their responses. After transferring the data, the data set was printed and examined manually for completeness. No questionnaires had to be eliminated from this study.

### III.4    Data Analyses

The data analyses for this study were comprised of three stages. First, descriptive statistics and frequencies distributions were performed to gain insight into the make-up of the sample. Second, bi-variate analyses were conducted to examine the relationship between physical proximity and the use of specified communication channels for specific employee types. Third, regression analyses were performed and General Linear Models were developed to learn more about the relationships between e-mail communication, physical proximity, and important demographic variables. The next several paragraphs provide a more detailed description of the steps performed in the analysis of the data.

In the first stage of the data analysis, frequency distributions were performed on selected demographic data. Frequency distributions for gender, age, education level, time in organization, level in organization, team in organization, and work location were conducted. Descriptive statistics were conducted to determine the Cronbach alpha scores and standard deviation for the three scales used in this study. The same descriptive analyses were performed for the physical proximity to others and communication channel items. However, for these items, percentages were also identified.

In the second stage, bi-variate analyses were performed to examine the relationship between physical proximity to others and communication channels. Gammas were used to determine the amount of communication received from and sent to others in the workplace for specified employment levels. The same analyses were run to examine this relationship based on work location, education level, and other important variables. The trust and psychological sense of community in the workplace items were averaged to create the three scale scores. Correlation analyses were performed with the three scales and selected demographic data. Based on these preliminary results, the data for several demographic variables (i.e., age, time in organization, and education level) were grouped to create more useful measures. Several gammas were re-run

using the recoded variables to examine their relationship to the use of the four selected communication channels (i.e., face-to-face, telephone, paper, and e-mail).

Given that there was minimal difference between scores for communication received from and sent to others, these two items were combined to obtain a total communication score for each communication channel. Descriptive statistics were run to obtain the new means and standard deviations. Correlation analyses were conducted for each of the selected employment levels to examine the three scales and the total communication across the four channels. Then, a series of one-way Analyses of Variance (ANOVA) were performed to examine the total communication volume by physical proximity, work location, gender, age, time in organization, employment level, team in organization, and education level. The mean differences for the significant relationships of these items were examined using Tukey's HSD post-hoc. One-way ANOVAs with the three scales and selected demographic items were performed and the mean differences examined for the significant relationships of these items. Tests for linear trends were performed where appropriate.

Because the focus of this research was to learn more about e-mail communication and its relationship to trust and sense of community, communication ratios for each employment level were developed. These ratios determined the amount of e-mail used versus the remaining three communication channels. Once the communication ratios were created, descriptive statistics were run to obtain means and standard deviations. Correlation analyses were performed using the communication ratio for each of the selected employment levels and the three scales. Then, one-way ANOVAs with the communication ratios and selected demographic data were conducted. The mean differences using HSD post-hoc were run for the significant relationships among these items.

The General Linear Model (GLM) was selected to perform the analyses of multiple variables in this study. This model underlies most of the statistical analyses used in applied and social research like t-tests, ANOVA, Analyses of Covariance, and regression analysis. This model, unlike multiple regression analysis, allows for the simultaneous presentation of results for continuous and categorically independent variables. The purpose of using the GLM was to draw inferences about which independent variables were related to the communication ratios as well as trust and psychological sense of community in the workplace.

The development and determination of the final models for this study consisted of an extensive three-phased approach. First, based on the relationships identified in the initial analyses of the data, GLMs were created with important independent variables. These initial models were performed to investigate and determine the independent variables that were related to the communication patterns of respondents as measured by the communication ratios. The data was screened to identify significant relationships. Many of the independent variables used in the original GLMs because of their lack of significance, resulting in a reduced set of independent variables for the communication ratios and scales. Second, the reduced set of independent variables was used to perform an additional screening of the independent variables and their relationship to the communication ratios. Again, several independent variables were eliminated based on their lack of significance to the communication ratios. Third, these reduced sets of independent variables were used to create the final models.

### III. 5   Chapter Summary

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