The Cross-Level Relationship Between Project Team Learning and Project Team
Identification: A System of Action Perspective

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Dedication

This dissertation is dedicated to my family:

— My wife Julie, whose endless support, encouragement, and love motivate and inspire me, always.

— My children, Alaina, Jude, and Alison, who fill me with pride and compel me to strive beyond what I imagined possible. I hope that my journey expands your vision of what is possible, whatever path you choose.

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Thank you to all the characters in my story that have made this experience gratifying, enjoyable, humbling, and challenging. I look forward to the sequel.

Abstract of Dissertation

The Cross-Level Relationship Between Project Team Learning and Project Team
Identification: A System of Action Perspective

This study examined the relationship between project team learning and project team

identification through the lens of a system of action. The basic research question guiding

this study was, "Do project team learning actions predict project team identification?"

This study used survey methodology to examine data from 1100 individuals in 72

independent project teams in a large technology and engineering company. Project team

identification was measured at the individual level of analysis and project team learning

actions were measured at the project team level of analysis. The project team learning

survey included separate measures for total project team learning and for each of four

subsystems of learning. Because the measurements were at separate levels of analysis,

hierarchical linear models were used to examine the relationships. Project team learning

was found to predict project team identification (coefficient = 0.28, $p < 0.01$). In

addition, all four of the project team learning subsystems were found to predict project

team identification as follows: memory and meaning learning actions (coefficient = 0.27,

$p < 0.01$), action and reflection learning actions (coefficient = 0.22, $p < 0.01$),

dissemination and diffusion learning actions (coefficient = 0.22, $p < 0.01$), and

environmental interface learning actions (coefficient = 0.24, $p < 0.01$). This study

contributes to the theoretical literature on organizational learning and organizational

identification because it reveals the cross-level nature of the relationship between

collective level learning actions and individual level identification. The relationships

found in this study strengthen and support theoretical propositions that organizational and

contextual factors relate to identification. The results of this study also have practical

implications for managers. It is more important than ever to understand the impact of

organizational actions on members. This study contributes to understanding the impact

of project team learning actions on project team identification and research has shown

that higher levels of identification result in positive outcomes for individuals and

organizations. Managers may be able to enhance project team learning capacity,

potentially leading to positive outcomes.

Table of Contents

List of Figures

List of Tables

Chapter 1 Introduction

Overview

Organizational identification is defined as an individual's "perceived oneness with an organization and the experience of the organization's successes and failures as one's own" (Mael & Ashforth, 1992, p. 103). Organizational identification can explain and predict attitudes and behaviors that result in "coordinated corporate action" (Edwards, 2005, p. 208) and can influence the "direction and persistence of…collective behaviors" (Albert, Ashforth, & Dutton, 2000). The extant identification literature has examined the association of identification with multiple targets such as organizations, departments, and work groups. In this study, the target of identification is the project team. Project teams are defined as subunits within organizations that execute projects that have a defined set of resources, goals, and time limits (Hobday, 2000). Previous theory and research has primarily focused on individual, psychological motives of identification (Cooper & Thatcher, 2010) without considering the organizational and contextual factors that influence identification (Whetten, 2007). There is a gap in the literature regarding these organizational and contextual factors and their relationship to project team identification because while studies of individual psychological motives may provide some understanding of identification, they ignore the more complex, cross-level relationship between individuals and collectives provided by a systems perspective.

Organizational learning is defined as a collective's "system of actions, actors, symbols, and processes that enables an organization to transform information into valued knowledge which in turn increases its long-run adaptive capacity" (Schwandt, 1997, p. 343). The collective in this study is the project team. Organizational identification, as

1

the focal construct of this study, has been examined in the literature for over 50 years. Groundbreaking work in the field occurred approximately 20 years ago with Ashforth and Mael's (1989) introduction of social identity theory as the primary theory underlying identification. Organizational learning, as the complementary construct in this study, has been of interest to organizational scholars for more than 60 years. This study draws on these works to extend theory in organizational identification by examining the relationship between project team learning and project team identification in a cross-level model.

Statement of the Problem

People have difficulty answering the question "Who am I?" in terms of their relationship with their organizations or work units because traditional, stable organizational environments have been replaced by ones that are more tenuous and uncertain (Albert, Ashforth, & Dutton, 2000; Ashforth, Harrison, & Corley, 2008). When this question remains unanswered, organizations and individuals can experience problems resulting from poor performance based on lower job satisfaction, higher turnover intentions, decreased job involvement, and weaker motivation (Van Knippenberg & Van Schie, 2000). Research has shown that when this question is answered, organizations enjoy improved cooperation, extra effort by employees on behalf of the organization, and loyal support for the organization (Edwards & Peccei, 2007).

The current challenge in organizations that this study addresses is increasing understanding of member identification in ways that can lead to positive outcomes for project teams and individuals. Trends in the characteristics of work environments are changing the relationship between people and organizations (Ashforth, Harrison, &

Corley, 2008). Trends such as globalization, flexible work arrangements, virtual work, technology, and nontraditional organizational structures can render membership in the organization difficult to define (Ashforth, Harrison, & Corley, 2008; Lipponen, Helkama, Olkkonen, & Juslin, 2005; Oldham & Hackman, 2010; Thatcher & Zhu, 2006). Diversity in organizations is increasing as social and political boundaries dissolve, and people with different backgrounds, expectations, and values become more common in organizations (Albert, Ashforth, & Dutton, 2000). New organizational forms and business models that include contract work, outsourcing, and the increased use of project teams are blurring the lines between organizations and their members (Child & Rodrigues, 2003; Hobday, 2000). These trends, while providing positive workplace conditions such as reduced bureaucracy, focus, and accountability, can also engender damaging outcomes such as employment and income insecurity, anxiety, and blurring of roles. These outcomes can undermine organizational operations (Child & Rodrigues, 2003).

Understanding the organizational factors that relate to how individuals answer the question "Who am I?" could help promote project team identification (Ashforth & Mael, 1989; Ullrich, Wieseke, Christ, Schulze, & Van Dick, 2007; Van Dick, Wagner, Stellmacher, & Christ, 2005; Van Knippenberg & Van Schie, 2000). Because identification occurs in a social context (Fiol & O'Connor, 2005) and the relationship between people and collectives is reflexive (Giddens, 1984; Kozlowski & Klein, 2000; Schwandt, 1997), identification is influenced by organizational actions (Whetten, 2007) that establish common goals, shared understanding, symbolic values, structures, practices, interpersonal interaction, and competition (Ashforth & Mael, 1989; Child & Rodrigues, 2003). Organizational actions can develop, strengthen, and maintain

perceptions of oneness or belongingness in members (Corley & Gioia, 2003) and studies of identification should control for or directly examine these influences (Whetten, 2007).

Ashmore, Deux, and McLaughlin-Volpe (2004) say that multiple, interwoven contextual elements can directly affect identification including material realities, social structures, patterns of interaction, and shared beliefs. Studies often acknowledge that norms, values, beliefs, missions, goals, structures, and knowledge of the environment become accessible to members through the actions of the collective, but do not directly examine this influence (e.g., Dutton, Dukerich, & Harquail, 1994; Cardador & Pratt, 2006; Hogg, Sherman, Dierselhuis, Maitner, & Moffitt, 2007).

By directly examining the relationship between project team learning and project team identification, this study can provide insight for managers seeking to help members understand who they are in relation to their project teams. Organizational learning is a multilevel construct that occurs at the organization, group, and individual levels and includes aspects of culture, strategy, structure, and interaction with the external environment (Bapuji & Crossan, 2004; Schwandt, 1997; Vera & Crossan, 2003). At the organizational and group levels, organizational learning takes the form of interrelated systems of action that are integrated and institutionalized through interaction. At the individual level, organizational learning is embedded in the intersubjective meanings developed by members of the collective as they make sense of the organization. An individual's understanding of the organization, based on intersubjective meanings, contributes organizationally relevant schemas for identification (Vough, 2011) associated with the salience of the collective as an entity, resolution of uncertainty regarding the collective, self-esteem, and self-verification.

Purpose and Research Question

The purpose of this research study is to examine project team identification using a multilevel approach that recognizes the relationship between project team actions and individual perceptions (Kozlowski & Klein, 2000). The basic research question guiding this study is, "Do project team learning actions predict project team identification?"

Statement of Potential Significance

According to Ashforth, Harrison, and Corley (2008), organizational identification encompasses who people are and why they do what they do in organizations, both positive and negative. It is central to choosing organizational membership, determining how work gets done, and developing relationships with others. As trends in work environments continue to move away from traditional, hierarchical structures toward less well-defined and fluid arrangements, organizations need to understand the organizational and psychological impacts of their actions on identification. This study helps to foster this understanding by using a cross-level design that is more robust than traditional designs because it addresses several limitations of other approaches. This study also aids understanding by using a comprehensive model of organizational learning actions that is grounded in sociological theory. This study has potential significance for both practice and theory in organizational learning and organizational identification as described in the following sections.

Contribution to Practice

This study contributes to practice by providing organizations with insight into how learning actions within project teams are related to identification, potentially resulting in lower turnover, higher satisfaction, and contributions beyond the assigned

tasks. A key question in identification research is, "Can identification be fostered in such a way that the positive outcomes are enhanced while mitigating the negative outcomes?" (Ashforth, Harrison, & Corley, 2008, p. 349). Kreiner and Ashforth (2004) highlighted the potential for disidentification, ambivalent identification, and neutral identification that can have negative outcomes for individuals and organizations. If the hypotheses of this study are supported, organizations and managers of project teams may be able to foster in members a sense of belonging that produces positive outcomes by focusing on and developing project team learning capacity.

Organizations that are experiencing high turnover rates, low job satisfaction, and other symptoms of low levels of identification may be able to use the results of this study as a guide to improve the effectiveness of their efforts to increase identification. For example, managers of project teams who perceive negative or neutral identification in team members could examine the robustness of project team learning based on the decisions they make regarding structure, culture, external information, and reflection. By assessing the effectiveness of project team learning and making appropriate changes to improve it, managers could potentially influence identification in project team members.

Finally, this study could contribute to practical issues related to negative effects of identification within organizations. For example, Glynn, Kazanjian, and Drazin (2010) found that high levels of team identification lead to decreased innovation intentions when inter-team interdependence is required because other teams are viewed as a threat. In this situation, the level of team identification is so high that team members are unwilling to collaborate across teams to innovate. By understanding that project team learning actions predict project team identification, managers may be able to make decisions related to

project team learning factors that lead to increased cross-team collaboration. For example, in organizations in which project teams are organized for product development and identification with the product team is inhibiting cross-product innovation, managers could reorganize by functional teams to change patterns of dissemination and diffusion across teams and redistribute members into different team configurations to potentially reduce perceived threats and improve cross-team innovation.

Contribution to Theory

This study contributes to theory in organizational identification by examining the relationship between project team learning actions and project team identification, which is significant because, as Whetten (2007) points out, organizations are highly complex social systems that use elaborate social structures to accomplish goals and purposes through action. By directly examining the relationship between project team learning actions and individual identification, this study answers recent calls for researchers and theorists to pay more attention to the organizational and contextual factors that influence identification (Ashmore, Deaux, & McLaughlin-Volpe, 2004; Haslam, Jetten, Postmes, & Haslam, 2009; Whetten, 2007).

This study also contributes to theory in organizational learning by examining the cross-level effects of project team learning on individuals. Organizational learning is a multilevel construct in which individual-level cognition, affect, and behavior influence the development of higher-level phenomena and higher-level phenomena affect lower levels of analysis (Bapuji & Crossan, 2004; Berends & Lemmers, 2010; Casey, 2005; Crossan, Lane, & White, 1999; Crossan, Maurer, & White, 2011; Karataş-Özkan & Murphy, 2010; Schwandt, 1997). Only a few recent studies have explicitly examined the

multilevel nature of organizational learning (Crossan, Maurer, & White, 2011). This

study adds to the literature by investigating the cross-level effect of project team learning

on individual identification using hierarchical linear modeling, an approach that has been

proposed for examining relationships that cross levels of analysis because it is more

robust than traditional techniques (Hofmann, Griffin, & Gavin, 2000).

Conceptual Framework

The theoretical constructs that are the foundations for this study are organizational

identification and organizational learning. The following sections provide a brief

summary of these constructs and propose the theoretical foundation for the relationship

between these constructs.

Organizational Identification

Organizational identification is defined as an individual's "perceived oneness

with an organization and the experience of the organization's successes and failures as

one's own" (Mael & Ashforth, 1992, p. 103). In their seminal work, Ashforth and Mael

(1989) applied social identity theory (SIT) to the study of organizational identification.

This new perspective introduced perceptions of classification in various social categories

that are abstracted from individuals. They say that identification "credits a collectivity

with a psychological reality beyond its membership" (Ashforth & Mael, 1989, p. 26).

Edwards (2005) describes organizational identification as a key psychological state that

links the employee to the organization. Organizational identification contributes to

understanding of the organization and the way to act within it, and the learning of

policies, role expectations, behavioral norms, and power. This understanding occurs

through symbolic interaction that helps to resolve ambiguities and creates a framework

for organizational experience. Shared values, beliefs, mission, structure, processes, and climate, among other factors, predict organizational identification (Ashforth & Mael, 1989).

Identity theory is another foundational theory that has influenced the study of organizational identification. This perspective is concerned with the relationship between individuals and social structures (Stets & Burke, 2003) and focuses on the multiple roles that people possess based on the competing demands and expectations of society (Pratt & Kratz, 2009). These roles have a significant impact on the way people perceive themselves in social environments.

Organizational identification has appeared in the literature with increasing frequency since the 1990s (Olkkonen & Lipponen, 2006). It has been associated with positive outcomes and benefits to individuals and organizations such as increased extra-role behavior (Dukerich, Golden, & Shortell, 2002), increased job satisfaction (Van Knippenberg & Van Schie, 2000), and reduced absenteeism (Cooper & Thatcher, 2010). Scholars have also addressed differences in attitudes and behavior as outcomes of identification (Van Dick, Knippenberg, Kerschreiter, Hertel, & Wieseke, 2008).

Fewer scholars have addressed antecedents of organizational identification (Schrodt, 2002). Antecedents examined in the literature include satisfaction, tenure, and role (Ekmekci & Casey, 2009), organizational identity (Dukerich, Golden, & Shortell, 2002), and construed external image (Dutton, Dukerich, & Harquail, 1994). Bullis and Bach (1991) examined multiplex network relationships and concluded that the presence of social interaction influences organizational identification. Myers and Kassing (1998) found that supervisor communication was a predictor of subordinate identification.

Bullis and Bach (1989) also found that organizational socialization was significantly related to organizational identification. Finally, Schrodt (2002) found a significant relationship between organizational culture and organizational identification. The system of action perspective used in this study is a more holistic and comprehensive approach to examining antecedents of identification than has been traditionally used in the past. Categories of project team learning actions organized by subsystems may provide broader insight into understanding identification than the singular variables found in most studies.

Organizational identification has also been described as a multi-foci construct (Bartels, Pruyn, de Jong, & Joustra, 2006; Olkkonen & Lipponen, 2006; Van Dick, Wagner, & Lemmer, 2004) with different targets of identification including individual-level (e.g., dyadic), group-level (e.g., department), and organization-level units. Scholars have provided various reasons for why identification with an organizational subunit may be stronger than identification with the superordinate organization. These reasons include the more concrete and proximal relationship of employees to project teams (Cooper & Thatcher, 2010); saliency of project team membership based on daily interaction within the group (Van Dick, Wagner, & Lemmer, 2004); and the tendency for members to identify more with smaller groups than larger groups based on the theory of optimal distinctiveness. Optimal distinctiveness describes how members balance striving to both fit in and stand out (Brewer, 1991). This study leverages the strength of subunit identification by studying project teams within an organization.

Mael and Ashforth (1992) developed an instrument to measure organizational identification that incorporates their cognitive, social identity theory approach to

organizational identification. This instrument has been used extensively in the literature

for measuring both organizational and subunit identification and it will be used in this

study.

Organizational Learning

Organizational learning is defined as "a system of actions, actors, symbols, and

processes that enables an organization to transform information into valued knowledge

which in turn increases its long-run adaptive capacity" (Schwandt & Marquardt, 2000, p.

43). A system may be defined as a society, a community, an industry, an organization, or

a project team. Shrivastava (1983) developed a typology of organizational learning

systems based on four perspectives from the literature: adaptation, shared assumptions,

knowledge of action-outcome relationships, and institutionalized experience. Adaptation

is described as the way in which the organization attends to the environment. Knowledge

of action-outcome relationships concerns the purposeful actions, strategies, and decision-

making of the organization. Institutionalized experience includes the processes, transfer

of knowledge, and technology used. Finally, shared assumptions include the shared

cognitive maps, beliefs, and norms of organizational members.

Informing this typology is a social action theory perspective. Parsons developed

the general theory of action, which focuses on systems of interactions at multiple levels

of analysis (Parsons & Shils, 1952). Actions consist of several elements including an

actor, a situation, symbols, rules, norms, and values. Actions are carried out by social

actors, which can be individuals or collectives (Casey, 2005). A situation is defined as

the physical and social objects (such as organizations or project teams) to which the actor

relates. Symbols are the way in which actors relate to the different elements of the

situation and attribute meaning to them. Rules, norms, and values guide action (Schwandt & Marquardt, 2000).

The general theory of action is grounded in sociology and it includes four interdependent sets of actions called functional prerequisites: adaptation, goal attainment, integration, and pattern maintenance. Adaptation includes those actions that relate the internal and external environment. Goal attainment actions set goals and allocate resources to attain those goals. Integration actions coordinate the activities of the system and include controls and processes. Pattern maintenance includes those actions related to symbolic meaning and culture (Schwandt, 1997). These functional prerequisites are reflected in Shrivastava's (1983) typology. Recent literature on organizational learning continues to address these subsystems in various ways, which will be described in more detail in Chapter 2 (Bapuji & Crossan, 2004; Crossan, Lane, & White, 1999; Schwandt, 1997; Vera & Crossan, 2003).

Underlying the functional prerequisites are four subsystems of action: behavior, social, culture, and personality (Bluth, 1982). It is in these subsystems of action that the relationship between organizational learning and organizational identification can be conceptualized. The behavior subsystem is based on adaptation and the adjustment to and transformation of the external world. The social subsystem is based on role expectations, coordination of functions based on roles, and positional aspects of roles such as status and power. The culture subsystem provides meanings, values, and beliefs to individuals and collectives as actors in the system, and clarifies what is acceptable and moral in the system. The personality subsystem translates meaning into specific orientations and motivations. Within the personality subsystem, individual tendencies

12

and inclinations based on biographical and historical development are merged with the meanings, values, and beliefs created in the culture subsystem. This merger is theorized to result in motivations and orientation to action within the system, both positive and negative, based on needs for success, rewards, self-esteem, and group membership. According to Bluth (1982), when meanings, values, and beliefs are institutionalized within a social system, they are also internalized by actors in such a way that they are incorporated into the character structure of the actor. The actor becomes one with the organization. Then the actor is motivated to perform in their role and enact the values and beliefs of the system.

Schwandt (1997) developed the Organizational Learning System Model (OLSM) based on Parsons' general theory of action. The OLSM includes four subsystems that align with Parsons' four functional prerequisites. The environmental interface learning subsystem represents adaptation and determines what information enters the system from the environment and how the system acts on the environment. The action and reflection subsystem represents goal attainment and evaluates new information, makes decisions, and sets goals for the system. The dissemination and diffusion subsystem represents integration and focuses on coordination, structure, roles, and processes within the system. The meaning and memory subsystem represents pattern maintenance and creates meanings, symbols, values, and assumptions. The meaning and memory subsystem is the foundation of the organizational learning system because it provides guidance and control for the other subsystems. Within this subsystem, organizational members interpret the symbols and actions of the organization through sensemaking.

The theory of action perspective incorporates individual, group, and

organizational levels in recursive relationships (Schwandt, 1997). This multilevel

perspective is also prevalent in recent literature on organizational learning. For example,

Crossan, Maurer, & White (2011) call for more focus on multilevel approaches to

organizational learning. They say that organizational learning is a bottom-up emergent

process, but that the emerged phenomena at the higher level influence lower levels of

analysis.

Multilevel Systems

According to Kozlowski and Klein (2000), organizations can be perceived as

multilevel systems and organization science is developing approaches to examine these

systems, combining micro and macro perspectives with the goal of developing a more

integrated understanding of phenomena across levels. Multilevel systems are

characterized by micro-level phenomena embedded in macro-level contexts and macro-

level phenomena emerging from micro-level interactions. The multilevel perspective is

based on general systems theory (GST) (Bertalanffy, 1968) and it incorporates principles

of open systems (Katz & Kahn, 1978) and social systems and cybernetics (Schwandt,

1997). Early work in GST-based approaches established that "group and organizational

factors are contexts for individual perceptions, attitudes, and behaviors and need to be

explicitly incorporated into meaningful models of organizational behavior" (Kozlowski

& Klein, 2000, p. 10).

Hitt, Beamish, Jackson, and Mathieu (2007) describe multilevel research as an

approach that is based on outcomes that result from many influences originating from

different levels of analysis because organizational entities exist in nested configurations.

For example, individuals are nested within project teams. The authors define level of

analysis as the "unit to which data are assigned for hypothesis testing and statistical analysis" (p. 1387). In addition, they say that the level of analysis should be aligned with the level of theory, defined as the "focal level to which generalizations are meant to apply" (p. 1387). Finally, the level of measurement is defined as the level from which data are gathered.

In this study, the level of analysis is the individual because organizational identification, as the construct of interest, describes an individual's sense of oneness or belongingness with a collective (Mael & Ashforth, 1992). In addition, as the dependent variable, identification is the focus of the statistical analysis that will be conducted in this study. Data gathering on organizational identification is conducted at the individual level and organizational learning action data is gathered at the collective level, resulting in a cross-level, direct effects model describing the relationships among independent and dependent variables at different levels (Hitt, Beamish, Jackson, & Mathieu, 2007). Cross-level, direct effects models typically describe the influence of a higher level construct on the perceptions, values, or behaviors of lower level entities as a constraining or enabling effect (Kozlowski & Klein, 2000).

One key element of developing valid multilevel models is establishing the linkage between levels. Kozlowski and Klein (2000) point out that a systems approach does not require everything to be related to everything else. The strength of this linkage, or embeddedness, of lower level-phenomena within higher levels is influenced by goals, structure, technology, socialization, leadership, and culture. In addition, proximal linkages between levels display more meaningful relationships than distal linkages. For example, the linkage between individuals and project teams is expected to be stronger

than the linkage between individuals and organizations because there are fewer

confounding and moderating factors in the more proximal linkage. This study examines

the proximal linkage between individuals and project teams.

Research Design Framework

According to Child and Rodrigues (2003), the relationship between organizational

learning and social identity, which is one of the basic theories underlying organizational

identification, is complex and needs to be examined at multiple levels including

individual, group, organization, and network. In addition, they say that this relationship

is recursive meaning that an individual's social identity influences organizational learning

and organizational learning influences one's social identity. The conceptual framework

for this study focuses on a part of this relationship and is depicted in Figure 1-1.
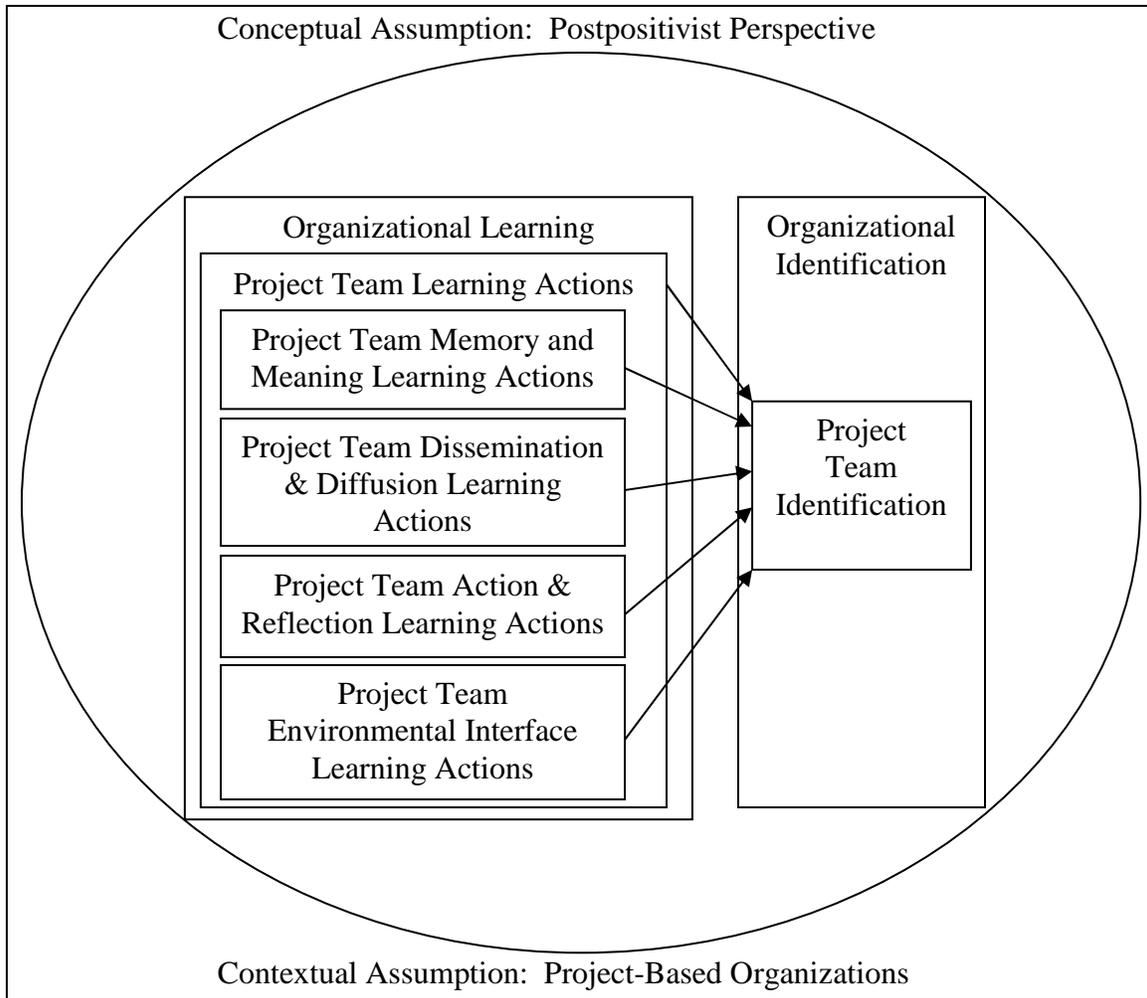
Figure 1-1 Conceptual framework

Postpositivist Orientation

Crotty (1998) describes postpositivism as a perspective that promotes the active

construction of scientific knowledge and that rejects the claim that scientific knowledge

is completely objective. Postpositivism allows for probability rather than certainty, levels

of objectivity, and approximate truth. Within this orientation, scientists question the

"value-neutral, ahistorical, and cross-cultural" (Crotty, 1998, p. 40) nature of reality.

They see research as incapable of attaining the total objectivity, certainty, and accuracy

of positivism. Postpositivists maintain the use of the scientific method and contend that

17

quantitative work can be conducted with a non-positivist approach. Postpositivists

present findings as objective truths that should be weighed, judged, and evaluated for

validity and generalizability. For example, although Parsons is generally considered a

functionalist, he incorporated postpositivist thinking, especially in his treatment of the

cultural aspects of his theory (Schwandt & Marquardt, 2000). Bluth (1982) quotes

Parsons' as saying that facts are "grounded in the orientation and frame of reference of

the analyst" (p. 8). As such, this study makes a contribution to scientific knowledge from

one researcher's perspective and contains the description of the research process and

methodology in sufficient detail for others to evaluate.

Project-Based Organization Context

The subject of project-based organizations is becoming more common in the

management literature as an alternative organizational form compared to other traditional

forms such as matrix and functional organizations (Blindenbach-Driessen & Van Den

Ende, 2010; Hobday, 2000). The number of people who work in groups or teams has

increased over the past few decades (Ellemers, De Gilder, & Haslam, 2004).

Decentralization and a focus on smaller units such as project teams are theorized to

promote innovation and learning (Blindenbach-Driessen & Van Den Ende, 2010;

Hobday, 2000).

A project-based organization is defined as an organization that is organized

around projects and produces complex, integrated systems or services that are aligned or

adapted to the specific needs of the customer (Blindenbach-Driessen & Van Den Ende,

2010). Projects are defined as any activity with a defined set of resources, goals, and

time limit (Hobday, 2000). In project-based organizations, the knowledge, capabilities,

and resources of the firm are developed through the execution of projects (Hobday, 2000). This study adopted Kodama's (2007) definition of project teams as organizations within project-based organizations in which project team members target shared objectives and collaborate. By referring to project teams as organizations, the author recognizes the autonomous nature of project teams.

Summary of the Methodology

This study used a quantitative, nonexperimental research design using survey methods and statistical analysis to determine if project team learning actions predict project team identification. A quantitative methodology was appropriate for this study because the purpose was to test the relationship between variables based on theoretical concepts from the literature. In statistical analysis, prediction is "the process of estimating scores on one variable from knowledge of scores on another variable" (Hinkle, Wiersma, & Jurs, 2003, p. 122). Prediction does not imply that the independent variable *causes* the scores on the dependent variable. In this study, project team members were surveyed about their perceptions of project team learning actions, a collective measurement, and about their own sense of oneness with the project team, an individual measurement. In addition, five survey questions formed control variables that were used in the statistical analysis.

This study used a convenience sample that typifies an organization that is structured by project teams. The subject of this study was an engineering and technical services organization of approximately 5200 employees. The sampling frame was a company-maintained database of employees sorted by assigned project team based on project codes used by employees to track time worked. The sample was derived from

this database by randomly selecting project teams from the list. Data were collected with an Internet survey via Survey Monkey and communication with participants took advantage of corporate email capabilities. Pre-notifications, invitations, and follow-ups were sent to the project team members to encourage participation and increase response rates.

Specifically, data for this study were collected using the 17 learning action items from the Organizational Action Survey (OAS) (Johnson, 2000) and the six items from the Mael and Ashforth (1992) organizational identification scale, along with five control variable questions, for a total of 28 items. Johnson (2000) developed the OAS based on the OLSM. The learning action questions from the OAS were used in two ways in this study. First, the total score for project team learning was calculated for each project team as the mean score of all team members for all 17 items. Second, each subsystem of the OLSM was measured as a separate independent variable by grouping the subset of items associated with each subsystem and calculating the mean score for each subsystem for each team. The data could then be analyzed by first testing whether project team learning as a total score predicted identification, and then testing each subsystem variable to gain further insight into the relationship between project team learning and project team identification. All items used a 5-point Likert scale with the exception of the control variable questions. Permission to use and modify these instruments was obtained from the developers.

Cronbach's alpha coefficients were calculated to measure the reliability of project team learning actions and project team identification items. The Cronbach's alpha calculations from this study for both the OAS (Johnson, 2000) and Mael and Ashforth

(1992) scale were compared to the reliability measures in the initial tests of the instruments and to other studies that have used these instruments in the literature.

Delimitations

This study was delimited by the relationship under investigation and the methodology used in the study as follows. The relationship under investigation in this study was the relationship between project team learning actions and project team identification. This study did not address other aspects of the vast amount of theory and research related to the two constructs, organizational learning and organizational identification. This study viewed identification as an outcome and not a process, which constrained the scope of the study. The choice of methodology included several delimitations. Using a convenience sample delimited the scope of the study to one organization and, within that organization, only a subset of individuals were selected to participate. The individuals selected were those on project teams performing tasks directly for customers. In addition, a survey was used to collect data, which delimited the types and sources of data included in this study.

Limitations

There were several limitations associated with this study. The purpose of this study was to understand relationships between the variables. This was not an experimental study and there was no control over the independent variables so causal inferences were not possible. This study did not use random sampling but was limited to a convenience sample with all members of the selected project teams invited to participate. The findings are, therefore, not generalizable beyond the scope of this study. This was a cross-sectional study so temporal aspects were not considered. The data

collected for this study was limited to self-reported data, which introduces the possibility of social desirability bias and dependence on the accuracy and truthfulness of the responses. Also, participation in this study was voluntary. Participant self-selection could bias the results. The possibility exists that other potentially confounding variables not included in this study could influence project team identification. Control variables were used to isolate these effects; however, these control variables may not fully account for other influences on identification. Finally, the type of statistical analysis used in this study limited the extent of the results that could be obtained. Other types of analyses would have yielded different types of results.

Definition of Key Terms

Table 1 provides the definition of key terms used throughout this document.

Table 1-1 *Definition of key terms*

Key Term	Definition
Organization	Collective representations that are characterized by mutually dependent actions (Schwandt & Marquardt, 2000).
Project-based organization	An organization that is organized around projects and produces complex, integrated systems or services that are aligned or adapted to the specific needs of the customer (Blindenbach-Driessen & Van Den Ende, 2010).
Project team	Subunits within organizations that execute projects that have a defined set of resources, goals, and time limits (Hobday, 2000).
Organizational learning	A system of actions, actors, symbols, and processes that enables an organization to transform information into valued knowledge which in turn increases its long-run adaptive capacity (Schwandt & Marquardt, 2000).
Project team learning	Organizational learning construct applied to the project team.

Organizational identification	A perception of oneness with or belongingness to an organization (Ashforth & Mael, 1989, p. 104).
Project team identification	Organizational identification construct applied to the project team level.

Chapter 2 Literature Review

Purpose of the Literature Review

The purpose of this literature review is to present the theoretical and empirical literature on organizational learning and organizational identification and to develop the evidence that supports the proposed relationship between project team learning and project team identification. This review also addresses potential counterarguments to the relationship proposed in this study as derived from the literature.

Method of the Literature Review

The following computerized, searchable databases were used to identify relevant peer-reviewed journal articles on organizational learning and organizational identification: Business Source Premier (via EBSCO), ProQuest/ABI Inform, Sociological Abstracts (via CSA), PsycINFO (via EBSCO), Web of Science Social Sciences Citation Index (SSCI), and Dissertations and Theses Online. In addition, the Surveyor catalog system was searched for book sources. The variety of these sources reveals the multi-disciplinary nature of organizational studies (Schwandt & Marquardt, 2000).

Search terms used to locate sources were organizational learning, organizational identification, identification, identity, social identity, and project-based organizations. Searches were focused on, but were not limited to, literature from approximately the past two decades. This time period was selected because the majority of the organizational identification literature is based on a seminal article published in 1989 (Ashforth & Mael, 1989). In addition, the publication of empirical research on organizational learning literature has grown significantly since the early 1990s (Bapuji & Crossan, 2004;

Easterby-Smith, Antonacopoulou, Simm, & Lyles, 2004). This review includes earlier

works that were derived from sources found through the primary searches. References to

earlier literature found in identified sources were located individually using the specific

citations found in the sources. The literature review was last updated in March 2011.

Organization of the Literature Review

The literature review begins with the identification literature, which forms the

foundation upon which organizational identification is based. Then, the organizational

identification theoretical and empirical literature is reviewed. Next, a review of the

organizational learning literature provides a unique perspective from which to view

organizational identification. Based on the literature, the relationship between

organizational learning and organizational identification is described to provide a clear,

concise, and compelling argument for this study.

Overview

This chapter provides the theoretical and empirical background for this study by

examining the literature related to the key constructs: organizational identification and

organizational learning.

Identification

Identification, in this study, is defined as the view of the self as the embodiment

of a prototype or standard (Stets & Burke, 2003). There are two primary theories of

identification in the social psychology literature: social identity theory and identity

theory. In their seminal work, Ashforth and Mael (1989) applied the perspective of social

identity theory to the study of organizational identification. In social identity theory,

social categories are the prototypes or standards used for identification. In the

25

organizational context, the social categories of interest are, for example, the organization, project teams, departments, and other groupings of employees.

Ashforth and Mael's (1989) perspective brought a new focus to organizational identification with its consideration of the organization as a unique type of social category with which people identify. In their view, identification "credits a collectivity with a psychological reality beyond its membership" (Ashforth & Mael, p. 26). Their social identity perspective of organizational identification has become the dominant approach in the organizational identification literature (Pratt, 2001; Whetten, 2007).

Identity theory has also influenced thinking on organizational identification (Sluss & Ashforth, 2007; Stets & Burke, 2000; Whetten, 2007). Identity theory focuses on roles rather than social categories and encompasses organizational roles such as occupations, professions, careers, and hierarchical positions (Ashforth, Harrison, & Corley, 2008; Stets & Burke, 2000).

The following sections describe these two primary theories of identification in more detail to provide a foundation for organizational identification. They are not intended as an exhaustive review of the literature related to these theories but rather are a subset of elements that are critical to understanding the study of organizational identification and its relationship to organizational learning.

Social Identity Theory

Social identity theory is a social psychology theory that proposes that identification occurs through two primary constructs: social categorization and self-enhancement (Stets & Burke, 2000; Tajfel & Turner, 1986). This theory is viewed from a psychological lens that focuses on the individual as the unit of analysis and cognition as

the primary mechanism. Social identity theory has significantly influenced the organizational identification literature of the last two decades (Cooper & Thatcher, 2010; Pratt, 2001; Whetten, 2007). The following sections examine social categorization and self-enhancement in more detail.

Social categorization. Social categorization is the delineation of group boundaries. Groups are defined as social categories of which people consider themselves members (Stets & Burke, 2000; Tajfel & Turner, 2004). Categorization is considered a cognitive tool that segments, classifies, and orders the social environment (Tajfel & Turner, 1986).

Social identity theory recognizes two general categories of groups: ingroups and outgroups. Ingroups are the self-referenced categories of which people see themselves as members. Ingroup members see others within the group as similar to themselves. Outgroups are categories with members that are different from those who belong to the ingroup and to which the ingroup members compare themselves (Pratt, 2001). Categories of groups are based on stereotypes that serve as abstract representations that highlight relevant elements and distinctive attributes in context. Typical stereotype attributes include the following: attitudes, beliefs, values, affective reactions, norms, and styles of speech (Hogg & Terry, 2001; Stets & Burke, 2000).

Self-categorization theory was derived directly from social categorization theory to elaborate upon social categorization and specify in detail how categorization fosters identification (Hogg & Terry, 2001). In self-categorization theory, the stereotype that results from social categorization is further elaborated as a depersonalized prototype. A depersonalized prototype is described as the result of a shift from perceptions of the self

27

as a unique person to an interchangeable exemplar of a social category based on stereotypical attributes (Turner, 1985). It is a merger between the self and the ingroup. The development of a depersonalized prototype is an individual transformation from identification with the self to identification with the ingroup.

Self-categorization, and particularly the idea of a depersonalized prototype, is critical to understanding how identification occurs from the perspective of social identity theory. According to Hogg and Terry (2001), depersonalized prototypes "embody all attributes that characterize groups and distinguish them from other groups" (p. 5). These attributes include beliefs, attitudes, feelings, and behaviors that are constructed, maintained, and modified through social interaction. The depersonalized prototype is formed from the interrelationship of the various attributes that contribute to perceptions of group distinctiveness. Shared perceptions of distinctiveness are formed within groups because patterns of social interaction are shared, leading to similar prototypes (Turner, 1985).

Self-categorization theory led to the development of another aspect of identification that is influenced by the depersonalized prototype. This aspect, known as the uncertainty reduction hypothesis (Hogg & Terry, 2001), states that depersonalized prototypes describe and prescribe the attributes of groups in a way that reduces uncertainty within the group. Turner (1985) provided the basis for this hypothesis in his discussion of informational and normative influence as uncertainty reduction. Informational influence is the acceptance of the ideas of others regarding ambiguous, complex, problematic, or unstructured perceptions about the environment. Normative influence is the adherence to the expectations of others based on a need for acceptance

and approval. Reduction of uncertainty provides meaning, establishes expectations, and emphasizes the shared norms and behaviors that are expected in the group (Hogg, Sherman, Dierselhuis, Maitner, & Moffitt, 2007;

Self-enhancement. Social categories are compared to one another based on the attributes that define the category stereotypes (Stets & Burke, 2000). Comparisons between groups are value-laden; therefore, categories can be perceived as positive or negative (Tajfel & Turner, 2004). Self-enhancement is the process by which, through comparison, group members selectively choose those attributes of the ingroup that compare favorably against selected attributes of the outgroup. Self-enhancement is also described in the literature as self-esteem (Tajfel & Turner, 1986).

The comparison of groups is influenced by the salience of those groups. Salience is defined as the matching of social categories to the social context and subsequent identification based on accessibility and fit (Hogg & Terry, 2001; Turner, 1985). Accessibility is described as the ease with which an input of some kind (e.g., action or language) that is experienced in a specific situation is categorized based on past learning and current needs. Fit is determined by the degree to which the input aligns with a category (Turner, 1985). Accessibility is influenced by the distinctiveness of the attributes of the depersonalized prototype with which inputs are associated and fit is influenced by the clarity of norms and expectations as defined by the attributes of the depersonalized prototype. These influences indicate that salience is partially determined by the societies, cultures, structures, and ideologies that collectively instruct and shape perception (Haslam, Oakes, Reynolds, & Turner, 1999).

However, as Hogg and Terry (2001) point out, salience does not conform to a

simple formula such as: accessibility x fit = salience. Since identification occurs through social interaction, other factors are also involved as individuals enact their environment. Enactment is the process by which actions result in the creation of constraints and opportunities in the environment (Weick, 1995). Similarly, Giddens (1984) describes the duality of structure that explains how structure is both the medium for and the outcome of human interaction. This recursive relationship between people and their environments indicates that self-enhancement occurs not simply as a passive perception of accessibility and fit, but also as active participation in shaping accessibility and fit.

  Limitations of social identity theory. Some drawbacks to the application of social identity theory and self-categorization theory as applied to organizational studies have been noted in the literature. Whetten (2007) recognizes the significant contributions of social identity theory to the study of identity and identification in organizations while at the same time criticizing the application of the taken-for-granted assumptions of the theories in the context of organizations.

  In particular, Whetten (2007) highlights three aspects of organizational reality that are not adequately addressed by social identity theory. First, membership in organizations is not assigned the way that ethnicity or skin colors are, but instead is acquired or selected. Individuals and organizations determine membership, with organizations occupying a power position over individuals. This situation has unique implications for organizational identification. Second, the meaning of membership in organizations has become ambiguous based on contexts such as outsourcing, globalism, and telecommuting. This factor influences identification in ways that are not considered when membership is clear and unambiguous. Third, organizations, as social actors, are

different from other categories typically examined in the social psychology literature such as ethnicity or religion. These aspects of organizations require a critical evaluation of the assumptions and application of social identity theory for the study of organizations.

Tyler (2001) notes that social identity theory research was initially intergroup focused and based on laboratory experiments of minimal groups, which are groups formed randomly and arbitrarily with members who have no stake in the groupings. Organizational applications adapted these theories to the study of real organizations, which are quite different from the laboratory. The real world, he points out, is made up of groups with structures and hierarchies that represent status upon which careers and livelihoods are based. The following section reviews the literature on identity theory, which provides some insight into the structure and hierarchy concerns of Tyler and complements social identity theory in ways that address some of Whetten's (2007) concerns.

Identity Theory

Identity theory is another social psychology approach to identification and is focused on roles and structure. It is rooted in sociology and the recursive relationship between individuals and social structures (Stets & Burke, 2003). The central idea of identity theory is that people possess multiple roles based on competing demands and expectations of society (Pratt & Kratz, 2009). These roles have a significant impact on the way people perceive themselves in social environments. Whetten (2007) states that identity theory and social identity theory are complementary theories in the context of organizations because groups and roles are both significant aspects of organizational life. Stets and Burke (2000) and Ashmore, Deaux, and McLaughlin-Volpe (2004) have shown

how identity theory and social identity theory share some similarities. This review takes advantage of their work by describing four identity theory concepts in terms of their similarities and differences as compared to social identity theory.

First, in identity theory, *identification* is the equivalent of self-categorization, except categories are named and classified within the social structure rather than as ingroups and outgroups (Stets & Burke, 2000). Names and classifications are based on symbols that are learned within a particular context (e.g., society or organization) and are called roles. Roles carry with them norms, expectations, and behaviors that are mutually recognized. Roles address part of Whetten's (2007) and Tyler's (2001) concerns that social identity theory does not consider unique aspects of organizational life. Roles encompass aspects of organizations, such as power, status, and hierarchy, which are not considered in social identity theory. Although the specific categories of identification for the two theories are different, they share a similar basis for categorization, which is the recognition of a structure within which identification is formed.

Second, *salience* is a concept shared by both social identity theory and identity theory. Salience, as described by social identity theory, is the activation of an identity based on accessibility and fit within a specific context, complicated by other motives and enactment (Hogg & Terry, 2001; Turner, 1985; Weick, 1995). In identity theory, salience is defined simply as the likelihood that an identity will be activated frequently across different situations and is focused on actions (Stets & Burke, 2003). Salience is based on both quantitative and qualitative dimensions. Quantitatively, salience is dependent on the number of others to which a person is related in the social structure. Qualitatively, salience is dependent on the strength and depth of meaning associated with

the structural ties.

Social identity theory and identity theory views of salience overlap in the area of enactment. Social identity theory recognizes that there is more to the activation of identity than the basic facilitating conditions of accessibility and fit. Individuals act based on their goals and purposes to influence their environments. However, social identity theory is still primarily concerned with how situations influence the salience of various identities (Hogg & Terry, 2001). Identity theory places more emphasis on the factor of agency, the active role individuals play in their environments, and its relevance to salience. Identity theory, in contrast to social identity theory, is focused less on the influence of the situation on salience than on the enactment of identity based on individual goals and purposes and enactment within the situation (Stets & Burke, 2000). These differing views are two sides of the same coin and represent the recursive nature of the relationship between the individual and the social structure (Giddens, 1984; Schwandt, 1997; Stets & Burke, 2000).

Third, depersonalized prototyping in social identity theory and *self-verification* in identity theory are conceptually similar but differ in the focal element. Depersonalized prototypes are formed based on the attributes of category stereotypes (Hogg & Terry, 2001; Turner, 1985). Self-verification is a similar process of prototype development but is based on the attributes associated with a standard, prototypical role instead of a prototypical group (Stets & Burke, 2000). In both cases, the meanings, beliefs, and norms of groups and roles that are held as prototypical are the standards that influence how members act.

Fourth, in identity theory, *self-efficacy* refers to the motivational aspect of self-

verification and explains why members act to maintain their perceptions of the self in alignment with the prototypical role. Self-efficacy refers to belief in the ability to act as a causal agent, presumably toward positive outcomes (Stets & Burke, 2000). In social identity theory, self-enhancement, or self-esteem, and uncertainty reduction function in a similar manner to maintain alignment with the prototypical group by acting in ways that increase value for the group and that meet the expectations of others (Hogg & Terry, 2001). In both social identity theory and identity theory, these motivations are based on values and standards of behavior that are shared amongst members.

Table 1 shows an adapted version of the corresponding ideas in the two theories as described by Stets and Burke (2000).

Table 2-1 *Identity theory and social identity theory comparison*
Similarities between concepts in identity theory and social identity theory

Identity Theory	Social Identity Theory	Key Similarities
Roles	Categories (groups)	Recognition of structure as the foundation for categorization
Salience	Salience	Recognition of goals and purposes
Self-verification	Depersonalized prototype	Meanings, beliefs, and perceptions of norms
Self-efficacy	Self-esteem (and self-enhancement and uncertainty reduction)	Values and standards of behavior

This summary view of identity theory draw parallels to social identity theory and illustrates that the major mechanisms described in the two theories are similar. The differences lie in the perspective from which identification is viewed. These theories are necessary in developing an understanding of organizational identification because the majority of the organizational identification literature is based on the assumptions of these theories (Pratt, 2001; Whetten, 2007). The literature on organizational identification is reviewed in the next sections.

Organizational Identification

Social identity theory and identity theory were developed in the field of social psychology and applied to a broad range of topics in racial, political, and social contexts (Tajfel & Turner, 1986; Turner, 1985; Stets & Burke, 2003). They have also been borrowed and applied to the study of organizations and have contributed to the development of the concept of organizational identification (Pratt, 2001; Whetten, 2007). From the view of social identity theory, organizational identification is considered a particular type of social identification (Pratt, 2001). From the view of identity theory, organizational identification is seen to align with roles that are assumed within the context of organizational structures (Stets & Burke, 2003). Based on the similarities between the elements of social identity theory and identity theory outlined in Table 2-1, this study draws from social identity theory as the main foundational theory and defines organizational identification as "a perception of oneness with or belongingness to an organization" (Mael & Ashforth, 1992, p. 104). Although this definition is rooted in social identity theory, it is compatible with identity theory. This sense of oneness with or belongingness to the organization can be defined in terms of the role occupied as a social

category that includes others that occupy the same role. Social identity theory recognizes multiple identities.

Studies have addressed multiple foci as targets of identification including other individuals, groups, and organizations (Bartels, Pruyn, De Jong, & Joustra, 2006; Olkkonen & Lipponen, 2006; Van Dick, Wagner, & Lemmer, 2004). Organizational identification has been associated with various positive organizational outcomes such as cohesive work atmosphere, greater levels of cooperative behavior and altruism, and higher levels of citizenship behavior (Dukerich, Golden, & Shortell, 2002; Edwards & Peccei, 2007; Kane, 2010). It has also been linked to outcomes such as positive self-esteem (Ashforth & Mael, 1989; Rousseau, 1998) and job satisfaction (Van Knippenberg & Van Schie, 2000) in individuals. To a lesser extent, organizational identification has also been associated with negative organizational outcomes, when, for example, individuals identify to such an extent that they lose their sense of individual identity or fail to see harmful, negative aspects of the target of their identification (Kreiner & Ashforth, 2004).

The purpose of this study is not to examine outcomes of identification. However, the extensive theoretical and empirical literature focused on these outcomes is evidence of the relevance of the study of organizational identification for organizations.

Levels of analysis. Some researchers have attempted to address collective levels of identification, for example, at the organizational level (Rao, Davis, & Ward, 2000). This collective concept of organizational identification treats the organization as the social actor in place of the individual and distinguishes itself from organizational identity, which is defined as the central, enduring, and distinctive attributes of an organization

(Albert & Whetten, 1984). Ravasi and Van Rekom (2003) say that organizational

identification "may be perceived as a property of a group based on an aggregate, a

concept akin to climate, job satisfaction, etc." (p. 124). Hakonen and Lipponen (2009)

examined how trust between team members and identification with the team relate to

effectiveness in virtual teams with an aggregated measure of identification using the Mael

and Ashforth (1992) scale. Tanghe, Wisse, and Van Der Flier (2010) also used the Mael

and Ashforth scale in their aggregate measure of identification as a moderator of the

relationship between group affect and team effectiveness. Other studies have

incorporated aggregate measures of identification using the Doosje, Ellemers, and Spears

(1995) scale (Solnet, 2006; Van Dick, Grojean, Christ, & Wieseke, 2006). However, the

majority of work has been conducted at the individual level of analysis.

Factors related to organizational identification. Ashmore, Deaux, and

McLaughlin-Volpe (2004) identify material, social structural, and sociopsychological

elements that influence identification including the following: structures, patterns, shared

belief systems, rules and procedures, and informal norms. Ashforth and Mael (1989) say

that understanding the organization, and how to act within it through the learning of

policies, role expectations, behavioral norms, and power, occurs through symbolic

interaction that helps to resolve ambiguities (uncertainty reduction) and creates a

framework for organizational experience. This framework, grounded in social identity

theory, includes shared values, beliefs, mission, structure, processes, and climate, among

other factors, that relate to organizational identification.

Based on these ideas, the factors that relate to organizational identification can be

grouped into four basic categories: cultural, structural, strategy and management, and

37

external. The following sections present some theoretical and empirical examples of these categories from the literature.

Cultural. Organizational culture is represented in the artifacts, espoused values, and basic assumptions of an organization (Schein, 1992). Ashforth and Saks (1996) linked organizational identification and organizational culture in their study of the socialization of newcomers. The authors defined organizational socialization as the learning of a cultural perspective from which to interpret experiences. Socialization is how individuals learn the beliefs, values, orientations, behaviors, and skills needed to function in the organization.

Dutton, Dukerich, & Harquail (1994) described culture as the rituals, symbols, ceremonies, and stories that result in shared patterns of behavior and interpretation. In their view, culture is the way in which the distinctive, central, and enduring characteristics of organizations are communicated to members, influencing and motivating identification. They urged future researchers to seek understanding of the relationship between perceptions of organizational actions and organizational identification because actions that are congruent with the distinctive, central, and enduring characteristics of the organization increase identification.

Cardador and Pratt (2006) described three primary influences on identification drawn from both the management and marketing literatures: relationships, behaviors, and symbols. These three influences directly reflect Schein's (1992) artifacts and espoused values as expressions of culture. Artifacts include the visible aspects of organizations such as products, ceremonies, behaviors, and symbols. Espoused values are shared beliefs that are socially validated through social interaction. According to

Cardador and Pratt, identification occurs partially through the relationships that form through social interaction by affecting communications, perceptions of similarity, and bonds of closeness. Behavioral consistency based on roles as explained by identity theory (Stets & Burke, 2003) influences identification because it fosters values and beliefs by reinforcing role requirements through enactment. Symbols are incorporated into the extended concept of the self as a member of a group that is distinctive and separate from other groups.

Rousseau (1998) examined the influence of symbols on identification by describing the use of slogans by organizational members such as those at United Parcel Service (bleeding brown) and Federal Express (bleeding purple) that signify universal, shared concepts and relationships between members and the organizations. Symbolic aspects of organizations convey meaning and alter the nature of interaction and the significance of relationships, which, in turn, influence identification.

Schrodt (2002) conducted a quantitative study of the influence of organizational culture on organizational identification in a single organization. The study was conducted using existing survey instruments to measure perceptions of culture and identification using correlation and multiple regression analyses to understand the relationships between them. The organizational culture instrument used was the Organizational Culture Survey (OCS) (Glaser, Zamanou, & Hacker, 1987). The organizational identification instrument was the Organizational Identification Questionnaire (OIQ) (Cheney (1983). The OIQ measures identification on three dimensions: membership, loyalty, and similarity. The study included two research questions exploring the existence of a relationship between culture and identification and

to what extent culture predicts identification. All six dimensions of culture represented in the OCS were found to be positively related to identification including morale, information flow, involvement, supervision, teamwork, and meetings. Morale, the way in which an organization treats its members, was found to be the single most significant predictor of identification accounting for 56% of the shared variance.

Structural. Structural influences on organizational identification encompass a variety of aspects of organizations. Structures are defined by Schwandt (2008) as "any enduring pattern of social arrangements within a particular collective" (p. 103), and include language, communication, norms, rules, relationships, leadership, policies and procedures, patterns of interaction, hierarchy, roles, infrastructure, justice and reward systems.

Communication. Bullis and Bach (1991) studied communication networks as predictors of organizational identification and concluded that multiplexity of communication links, defined as multiple relations between dyads, and the content of communication are related to organizational identification. Using stepwise multiple regression analysis, multiplexity was found to be a significant positive predictor of change in organizational identification over time.

In their multidimensional study, Smidts, Pruyn, and Van Riel (2001) examined the impact of employee communication, communication climate, and perceived external prestige on organizational identification. They found that communication climate, a structural element, influences identification. Communication climate refers to the openness, trust, decision-making participation, and supportiveness of the organization expressed in organizational communications and reflects the managerial approach to

conducting business in the organization. Communication climate was hypothesized to be

a mediating variable between communication and organizational identification based on

the idea that a positive communication climate conveys information about what is central,

enduring, and distinctive about the organization (Albert & Whetten, 1985). Using a

structural equation model, the authors found that communication climate significantly

influences identification. Bartels, Pruyn, De Jong, and Joustra (2006) extended the

Smidts, Pruyn, and Van Riel (2001) study by examining the influence of communication

climate and content at multiple levels within organizations. They found that

communications climate at the work group level predicted work group identification and

that communication climate at the department level predicted department identification.

Organizational justice. Several empirical studies have explored the relationship

between organizational justice and organizational identification. Organizational justice

has four components. Procedural justice is fairness of formal procedures used in resource

allocation decision-making. Distributive justice is fairness of resource allocation

outcomes. Interactional, or interpersonal, justice is fairness of interpersonal treatment by

supervisors (Lipponen, Olkkonen, & Moilanen, 2004). Informational justice is the

reasonableness of explanations used to convey information to individuals about

procedures (Cheung & Law, 2008).

Cheung and Law (2008) found that perceived organizational support including

rewards, fairness in patterns of exchange (e.g., pay, promotion), communication about

procedures, and recognition mediated the relationship between informational justice and

organizational identification and between interpersonal justice and organizational

identification.

41

Olkkonen and Lipponen (2006) focused on structural features within organizations at two different levels: organization and work unit. They studied the quantitative relationships between organizational justice, identification with the organization and with the work unit, and outcomes at both levels in a single research institution using existing survey instruments. Based on hierarchical regression analysis, the authors found that perceptions of procedural justice and distributive justice were significantly related to organizational identification.

Finally, Lipponen, Olkkonen, and Moilanen (2004) investigated the effects of organizational justice on organizational identification in a merger situation. Using multiple regression analysis the authors found a significant relationship between procedural justice and organizational identification. Each of these studies used the Mael and Ashforth (1992) scale for the measurement of organizational identification.

Other structural influences. Morgan, Reynolds, Nelson, Johanningmeier, Griffin, and Andrade (2004) theorized that a number of sources of identification are structural in nature including communication, policies, organizational forms, pay, benefits, and interaction. In their study of an agricultural equipment manufacturer, the authors investigated one department by surveying members to determine sources of identification. The analysis consisted of coding the narrative responses to two open-ended questions. The interpretation of the data found that the themes could be categorized into two groups. One group included sources of identification external to the organization including family influences and external perceptions of the organization. The other group included sources of identification internal to the organization and included structural influences such as pay, benefits, professional development

opportunities, recognition programs, and relationships between employees.

Reicher, Haslam, and Hopkins (2005) analyzed historical sources and
documentation from the BBC Prison Study (Haslam & Reicher, 2007) and found that
leaders "actively intervene in creating and redefining identities" (p. 563). Shared social
identity, they say, binds leaders and followers together and leaders initiate the structures
that make that shared social identity possible. Leaders also influence the development of
identification by providing an interpretation of what it means to be part of the ingroup
and by modeling the prototypical group member.

Strategic and managerial. Strategic and managerial influences on organizational
identification include performance goals, operating principles, strategic direction, and
other elements that develop the members' perception of distinctiveness and evaluative
judgments about how their organization conducts its business. Strategic and managerial
influences make the organization or subunit salient for members through substantive and
symbolic management (Ashforth & Johnson, 2001). Substantive management includes
real and material changes in practices leading toward common causes. Substantive
management includes measures such as managing the size of organizations or subunits;
developing missions, goals, and strategies; inducing competition with external enemies;
implementing socialization practices; and organizing social events. Symbolic
management is the approach used by management to portray the organization to its
members, and includes cultural elements in addition to managerial elements. For
example, organizations or subunits may articulate mission statements in particular ways,
choose to celebrate certain accomplishments, relate stories and historical achievements
that send a particular message, and decide on specific physical attributes for office spaces

and buildings. These influences on identification have been studied empirically in the literature as well.

For example, as described in the section on structural influences, Smidts, Pruyn, and Van Riel (2001) examined the impact of employee communication, communication climate, and perceived external prestige on organizational identification. Communication content, the authors hypothesized, should influence organizational identification because it provides information to employees about their roles and personal contributions to the organization's success and about the organization itself. Communication content may be related to both substantive and symbolic management. Communication content also contributes to uncertainty reduction by providing information and conveying expectations (Hogg & Terry, 2001). Their survey results showed that the interactive effect of the personal and organizational communication content significantly contributed to the perceived communication climate and its influence on identification.

Kreiner and Ashforth (2004) studied strategic and managerial influences on identification using an expanded model of organizational identification. Their model included four dimensions: strong identification, disidentification, ambivalent identification, and neutral identification. Disidentification is the disconnecting of oneself from the organization. Ambivalent identification is the presence of both identification and disidentification. Neutral identification is a state of neither identifying nor disidentifying. They categorized the antecedents of the four forms of identification as symbolic management and substantive management. Substantive management, as the relevant construct here, is described as material changes in organizational practices and includes decision-making and practices that are consistent with values and beliefs, high

44

involvement practices, and clear role expectations.

In addition to establishing the discriminate validity of the four dimensions, the authors examined several antecedents of the four dimensions of identification. Among other variables, organizational identity incongruence was the extent to which organizational decisions and practices were inconsistent with beliefs and values. Intrarole conflict was the extent to which roles were unclear or conflicting. Their survey results were analyzed using hierarchical multiple regression and showed, among other findings, that organizational incongruence, as a substantive management element, was significantly related to disidentification, which was not hypothesized, and ambivalent identification as hypothesized. These findings suggest that substantive management activities can reduce disidentification and ambivalent identification but may not foster strong identification.

External. A number of empirical studies have examined external influences as predictors of organizational identification (Fuller, Marler, Hester, Frey & Relyea, 2006). Dutton, Dukerich, and Harquail (1994), in their theoretical work on organizational identification, recognized the influence of construed external image on identification. They defined construed external image as the way members think outsiders view the organization. Construed external image may or may not reflect the actual way outsiders view the organization but the interpretation of that view was theorized to have a significant impact on identification of members.

Revisiting the multidimensional study by Smidts, Pruyn, and Van Riel (2001), the impact of perceived external prestige was found to be related to organizational identification. As an external influence, perceived external prestige, another term for

45

construed external image, is the way in which members of a group perceive how nonmembers view the group. Nonmember perceptions of organizations are gathered by members through various information sources, including publicity, external company-controlled information, and external opinions. This influence is based on self-enhancement motives because perceptions of how others think about the organization either increase or decrease the members' perception of value (Hogg & Terry, 2001). The study found that perceived external prestige was significantly related to organizational identification.

Others have also examined the influence of perceived external prestige on identification. Bergami and Bagozzi (2000) found that external prestige has a significant influence on identification. Dukerich, Golden, and Shortell (2002) used structural equation modeling to find that construed external image was significantly related to organizational identification. Fuller, Marler, Hester, Frey, and Relyea (2006) also found that construed external image was significantly related to organizational identification and is partially moderated by self-esteem. For individuals with a high need for self-esteem there was a moderately strong relationship between construed external image and identification. For individuals with a low need for self-esteem there was a little or no relationship between construed external image and identification.

Summary of the Identification Literature

Similarities and overlap between the two primary foundational theories of organizational identification have been explored in the literature (Stets & Burke, 2000; Whetten, 2007). Social identity theory is focused on the group to which one belongs as the basis of identity (Tajfel & Turner, 1986) and identity theory focuses on the role the

individual occupies (Stets & Burke, 2003). Both foundational theories describe concepts of salience. Identity theory describes salience in terms of social structure and interaction. In social identity theory, salience is characterized by the particular accessibility and fit in situations in which identity is activated. The processes of self-verification within roles in identity theory and the depersonalized prototyping of groups in social identity theory result in abstracted standards against which action is evaluated and enacted. Self-efficacy in identity theory and self-enhancement (or self-esteem) in social identity theory are similar motivating factors that generate actions taken to align with prototypical role and group standards, respectively. In social identity theory, uncertainty reduction is another motivator that is associated with the informational and normative aspects of understanding the environment.

Organizational identification literature draws from these foundational theories to explore a variety of factors that influence identification. Specifically, the literature identifies several general categories of influences on organizational identification: cultural, structural, strategic and managerial, and external. These categories represent the organizational sources of information that members use to construct and maintain identities (Tyler, 2001).

These sources provide the member with valued knowledge about group boundaries and roles. These sources also help make the distinctive attributes of organizations salient which leads to the formation of the depersonalized prototypes of social identity theory (Hogg & Terry, 2001) and the self-verification standards of identity theory (Stets & Burke, 2000). Finally, these sources also provide information that aids members in evaluation and comparison of categories driven by self-enhancement and

self-efficacy motives and the reduction of uncertainty.

      According to Turner (1985), the development of the depersonalized prototype marks the shift from unique person to interchangeable exemplar of a social category based on stereotypical attributes. It is a merger of the self with the collective. Using Ashforth and Mael's (1989) definition, it is the point at which a perception of oneness with the organization is formed. Furthermore, according to Turner, the depersonalized prototype develops from the interrelationship of the various attributes that contribute to perceptions of group distinctiveness through salience, self-enhancement, and uncertainty reduction. These attributes include shared values, beliefs, mission, structure, processes, and climate (Ashforth & Mael, 1989), which are all addressed in the organizational learning literature. The next section reviews the literature on organizational learning.

Organizational Learning

      In this study, organizational learning is defined as "a system of actions, actors, symbols, and processes that enables an organization to transform information into valued knowledge which in turn increases its long-run adaptive capacity" (Schwandt & Marquardt, 2000, p. 43). This study proposes that this system of actions provides, as Ashforth and Mael (1989) described it, a framework for organizational experience that includes valued knowledge such as shared values, beliefs, mission, structure, processes, and climate, among other factors, that predict organizational identification. This section begins with a description of a typology that has been used to categorize the organizational learning literature (Bapuji & Crossan, 2004). Then, expanding upon this typology as a framework, theoretical and empirical work in organizational learning is reviewed.

Organizational Learning Typology

Bapuji and Crossan (2004), in their review of empirical research in organizational learning between 1990 and 2002, described four categories of mechanisms of organizational learning: culture, structure, strategy, and environment. These four categories align with the categories of influences on organizational identification as described in previous sections. Cultural mechanisms, such as the degree of openness, participative decision-making, and organizational support, are elements of organizational learning. Structure includes the procedures, communication, membership stability, and composition of the organization. Strategic decisions, goals, and missions are set by management and provide a context for perceiving and interpreting the environment by those within the organization. The environment influences the organization's strategic direction, culture, and structure.

Others have incorporated this typology into discussions of organizational learning. For example, Crossan, Lane, and White (1999) described a multilevel organizational learning system in which structures and routines, strategies, interpretations and meanings, and the domains and environments in which organizations operate are the basic elements in which learning is embedded. Although the environment is not explicit in their framework, they state their assumption that organizations are open systems, indicating that an environmental interface exists (Katz & Kahn, 1978). Walsh and Ungson (1991) described culture, structure, decision-making, and organizational interaction with the environment as key elements of organizational memory and learning. Schulz (2002) says that rules, roles, conventions, strategies, structures, technologies, cultural practices, and capabilities are the repositories of organizational learning.

Schwandt (1997) presents an Organizational Learning Systems Model (OLSM) that integrates all four categories in a system of action. In order to focus this literature review within the vast organizational learning literature, the following sections review the literature representative of each of the four categories and indicate how those categories are relevant to the study of organizational identification.

Culture. Schein (1992) described culture as accumulated shared learning from a history of shared experience from which shared meaning develops. He defined culture as:

> a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems. (p. 12)

Numerous scholars have incorporated culture into macro-level discussions of organizational learning focusing on the development of collective meaning. Daft and Weick (1984) took an open systems view of organizations and described a process of organizational learning that includes scanning environmental data, interpreting and developing shared meaning, and taking action. The process of developing shared meaning reduces equivocality and results in a common understanding. Equivocality is "the extent to which data are unclear and suggest multiple interpretations about the environment" (Daft & Weick, 1984, p. 291). Schein (1992) proposed that organizational culture is a key element in organizational learning and that shared meanings, and experiences are essential for organizational learning effectiveness. Walsh and Ungson (1991) described culture as a memory retention facility of organizational learning that

includes language, shared frameworks, symbols, stories, and rumors via shared interpretations.

Other scholars have taken a micro-level perspective of culture focusing on interpretation and meaning making in individuals. For example, Fiol (2002) fundamentally addressed all four categories of organizational learning mechanisms in her description of cognitive theories of organizations. The cognitive approach, she said, addresses how information is obtained by an organization from the environment and the way in which it uses this information to make decisions and take actions. Cognition and interpretation affect the organization's strategy, mission, and adaptation. Primarily, however, she focused on the organization as a system of meaning creation that occurs through the interpretation and shared meaning of symbols.

Fiol (1994) described how consensus of interpretation is built in organizations by unpacking the process and identifying two distinct aspects of shared meaning: content and framing. She showed that organizational learning can occur even when individuals disagree about the specific meaning of the content of an issue if they agree upon a common framing associated with the issue. In her case study of a Fortune 100 financial services firm with diverse operating units, Fiol found, through linguistic analysis, that new-venture team members developed consensus in the framing of arguments about new ventures while remaining diverse in the content of their interpretations.

López, Peón, and Ordás (2004) studied 195 Spanish firms using a structural equation model to understand how a collaborative culture influences organizational learning. They surveyed general managers or executives of firms using the postal mail system to collect data using an instrument developed by the authors. They found that a

collaborative culture has a positive influence on organizational learning.

In their study of Texas State agencies, Moynihan and Landuyt (2009) integrated cultural and structural aspects of organizational learning by identifying five aspects of organizational learning that span cultural and structural elements, and some that display characteristics of both. The five aspects are: resources (structural), information systems (structural), mission orientation (cultural), decision flexibility (both), and learning forums (both). The authors hypothesized that adequate resources increase learning; effective information systems increase learning; understanding of the organization's mission, vision, and goals increases learning; decision-making empowerment and authority at lower organizational levels increases learning; and work groups that act as learning forums in which employees meet to discuss and examine issues increase learning. Learning forums are considered both structural and cultural, but are heavily dependent on the cultural attributes. Using ordinary least squares regression the authors found that project team learning forums had the most significant influence on organizational learning by a wide margin. The next most influential variable was information systems, followed by mission orientation, adequacy of resources, and decision flexibility.

Graham and Nafukho (2007) surveyed all 150 employees in a manufacturing organization to understand perceptions of how culture enhances organizational learning readiness. The authors used a preexisting organizational learning instrument that included multiple dimensions: culture, leadership, systems and structures, teams, evaluative inquiry, and demographics. Analysis of variance (ANOVA) was used to compare means for four different levels of longevity with the organization and for four different groups of shift workers. The results showed a statistically significant difference

in perceptions of the influence of culture on organizational learning based on longevity. Those with less time in the organization had higher perceptions of the influence of culture. The results also showed a significant difference in perceptions of the influence of culture on organizational learning based on shift. Those in Shift A (8:00 a.m. – 3:00 p.m.) had higher perceptions of the influence of culture than those in other shifts. This study, in addition to focusing on culture as a critical aspect of organizational learning, provides insight into the criticality of employee perceptions of the culture and its influence on organizational learning.

Culture is concerned with meaning and perceptions of members in the social context. As such, culture influences organizational identification through the development of meanings, beliefs, and perceptions of norms and values that are recognized as the depersonalized prototype of the organization. In this way, culture can be seen as the interface between the collective and the self at which the transformation from identification with the self as a unique individual to identification with the ingroup as a depersonalized prototype occurs (Hogg & Terry, 2001). In this study, the most significant aspect of this transformation is that it occurs through the interrelationship of the organizational learning mechanisms, which all contribute to individual perceptions of the group (Turner, 1985). While culture plays an important and central role in the transformation, the other mechanisms of organizational learning are interrelated with culture in their influence on identification.

Structure. Structures are described as patterns that develop from dynamic social interactions including communication, networking, coordination, norms, roles, policies, objects, practices, and processes (Schwandt, 1997). Crossan, Lane, and White (1999), in

53

their framework of organizational learning, described institutionalizing as "the process of ensuring that routinized actions occur" (p. 525) based on systems, structures, routines, prescribed practices, and information systems and infrastructure. Elsbach (2002) took a similar approach and described structures as intraorganizational institutions that include organizational structures, procedures, customs, and routines. She said that distinctive structural elements within organizations influence member identification because they help to make salient the characteristics that distinguish the organization from others.

In the identification literature, salience is affected by accessibility, fit, number and strength of connections within the social structure, and the individual's ability to enact structure. In the organizational learning literature, structure includes the learning of routine activities and rules by which people interact. Structure facilitates member understanding of how the organization operates and what is expected. Structure allows members to access the appropriate attributes of the organization that indicate how to behave, which increases salience for those members. In addition, since fit is influenced by how well members understand the norms and expectations of the group, the extent to which organizational learning actions increase this understanding will have an influence on identification. The number and strength of connections within the organization is partially determined by the organizational structure, the geographic diversity of members, and interdependencies. Finally, structure influences the ability of individuals to enact their environment through interactions with others. The structural aspect of organizational learning focuses on the structural patterns that enable or constrain interactions, which influence enactment and perceptions of self-efficacy based on the ability to enact.

In identification theory, self-enhancement and self-efficacy describe how members act to maintain alignment with the prototypical group to both increase value and meet the expectations of others (Hogg & Terry, 2001). Understanding and meeting expectations reduces uncertainty and emphasizes the shared norms and behaviors expected of members (Smith, Hogg, Martin, & Terry, 2007). Established organizational structures such as routines, norms, policies, and communications influence member understanding of expectations and facilitates the ability to act within accepted shared norms.

Fang, Lee, and Schilling (2010) investigated the structural dimension of organizational learning in their study of how interaction patterns influence organizational learning. Using a computer-based simulation model, the authors varied the structure of the modeled organization to examine resulting changes in the organization learning dynamics. The structure varied from nearly completely isolated subgroups with only minimal connections to each other to randomly connected individuals with almost no discernible subgroup structure. They found that semi-isolated subgroups with moderate cross-group linking (approximately 10%) resulted in the highest levels of organizational learning. The authors propose that the reason semi-isolated subgroups are the preferred organizational structure to promote organizational learning is that the subgroups are able to maintain individual diversity in thought and innovation while also learning from each other. The organization as a whole benefits from subgroup diversity, and cross-group learning improves group performance, which also benefits the organization. However, too many cross-group links tend to result in homogeneity of ideas, limiting diversity. Too few links constrain learning from high performers in other parts of the organization.

These results are consistent with the ideas about identification presented in beginning of this section including saliency, and self-enhancement or self-efficacy. Subgroups that are able to maintain independence and to possess distinctive attributes of their own make the subgroup salient to its members. Visibility into other subgroups through cross-group links facilitates self-enhancement by allowing comparison with other groups and re-alignment with prototypical groups in other parts of the organization.

Kieser and Koch (2008), based on their exploratory case study in two organizations in southern Germany, proposed that organizational learning occurs through the rules that exist and change within the organization. Rules, as structural elements, include hierarchies, jobs, rewards, careers, and work processes.

Situated learning theory takes yet a different view of the structural aspect of organizational learning. This theory focuses on more informal social practices and participation as structures of learning within social systems. It is a collective learning model that addresses how structures are reproduced and transformed through learning (Lave & Wenger, 1991). Situated learning theory has been studied in the context of identification.

Handley, Clark, Fincham, and Sturdy (2007) developed a methodological framework for the study of situated learning and used it to investigate a management consulting organization. Their framework has three primary elements: participation, practice, and individual identity. Participation encompasses the patterns of social norms and behaviors that occur in particular settings and the ways in which individuals come to understand and assign meaning to them. Practice includes role definitions, acceptable behaviors, and structures of social activities in which individuals participate. Within the

framework, participation and practice both play a role in influencing individual identity. Identity is defined as understanding who we are and what potential we have. Identity is shaped by the opportunities for participation available to individuals and the broader structural context in which they practice. Opportunities for participation and practice are then influenced by the individual identities of members. In their study, Handley et al. proposed that the development of identity and practice are mediated by the opportunities for participation available. They used mixed methods including interviews, observations, and analysis of documentary material to show how structures and norms influence the learning of practices and identities appropriate to the context in which they occur.

A study by Kane, Argote, and Levine (2005) indicates the recursive nature of the relationship between organizational learning and organizational identification. The authors examined how organizational identification influences organizational learning in the form of knowledge transfer. It focuses on routine practices and how they are influenced by identification. Using an experimental design, the authors conducted a study in which 144 students performed a task in three-person groups. Midway through the task one member from each group rotated and introduced a new approach to the task in the new group.

The authors hypothesized that the groups would adopt the new routine if all students in the group shared identification with an entity above the group level, known as a superordinate identity. Identification with a superordinate entity was manipulated experimentally. The authors also hypothesized that the group would be more likely to adopt the new routine if it was evidently superior to the one currently in use. Finally, they also predicted that when the members shared a superordinate identity, the new

routine would more likely be adopted if it were superior to one currently in use. The identification instrument was a combination of two preexisting instruments with data collected at the individual level and aggregated to the group level. Knowledge transfer was a binary measure indicating whether new routines were adopted or not. Results of a 2 x 2 x 2 repeated measures ANOVA supported the first hypothesis that knowledge transfer was more likely to occur if the group members shared a superordinate identity. The second hypothesis, that the group would be more likely to adopt the new routine if it was superior, was also supported. The third hypothesis was also supported. When members shared a superordinate identity, the new routine was more likely to be adopted if it was superior.

Strategy. Strategy includes the organization's goals, objectives, strategic directions, decisions, and plans. It defines the business of the organization for the members (Bapuji & Crossan, 2004). Daft and Weick (1984) described a recursive organizational learning process in which the environment is scanned and data is collected, the data are interpreted and meaning is created, and learning occurs as a result of actions that are taken based on the meaning of the data. Feedback then informs future scanning, interpreting, and learning. In their model, strategy formation and decision-making are part of the interpretation process and help to distinguish how organizations differ from each other. Managers scan the environment and interpret data using various approaches and their prior experiences and preferences. These interpretations result in strategies and decisions to act that are focused on distinguishing the organization from others and, in the case of profit-making companies, gaining a competitive advantage. These strategies and decisions then affect the environment in which the organization

operates, influencing future scanning, interpreting, and learning activities.

Crossan, Lane, and White (1999) offered a multilevel, general framework of organizational learning that focuses on achievement of strategic renewal. In their framework, organizational learning occurs at the individual, group, and organizational levels. These levels are linked by social and psychological processes of intuiting, interpreting, integrating, and institutionalizing. In their model, cognition affects action and action affects cognition. The integrating process occurs primarily at the group level and is focused on coherent, collective action and strategy. As part of a dynamic, multilevel organizational learning process, integration influences both organizational-level processes of institutionalizing and individual-level processes of interpretation. Interpretation is a social process of developing shared understanding, clarifying images of the organization, and reducing equivocality. The interpretation process, as influenced by collective action and strategy, facilitates understanding of what the organization is and does by its members.

Berson, Nemanich, Waldman, Galvin, and Keller (2006) examined the role of leadership influences on strategy in organizational learning using the Crossan, Lane, and White (1999) framework. While their focus was not solely on strategy, mission, goals, and decision-making, they did describe the role of those elements in organizational learning. Leaders help reduce the equivocality of environmental stimuli by condensing the focus of the organization into visions, missions, and goals, which then solidify into courses of action for members. In this way, leaders make salient for members the relevant information and the particular ways in which they will conduct their activities.

Yeo (2007) found that three factors directly influence organizational learning:

structure, systems, and strategy. The dissemination and sharing of strategy within the

organization, including the purpose, vision, and values by which the organization

operates, develop the cognitive and behavioral attributes that lead to organizational

growth and renewal as members reflect and discuss relevant issues. He described a

framework for change intervention through organizational learning that includes an

institutionalized, shared vision (a cultural element) as a necessity for organizational

learning because it represents an image and objective for the future that is common

among members. He says vision contributes to "building a sense of commitment and

unified direction" (p. 527) that induces members to strive to achieve organizational goals.

Bettis and Wong (2003) also described the way in which strategy, decision-

making, and top management thinking affect an organization's ability to learn. They

defined a dominant logic as the shared cognitive map and strategic mindset of the top

management team. The dominant logic partially determines what is important, valuable,

and distinctive about the organization and it directs attention and influences decisions at

all levels of the organization, including the beliefs, interpretations, and attitudes of

employees.

Carroll, Hatakenaka, and Rudolph (2006) examined the role of decision-making

in organizational learning in their mixed methods study of nuclear power plants. They

focused on naturalistic decision making, which describes how knowledgeable decision

makers make real decisions that often have significant consequences, for example, airline

cockpit crews and air traffic controllers. Specifically, they studied 27 problem

investigation teams and the managers who commissioned the teams in three nuclear

power plants. The researchers collected data via a questionnaire that was completed by

the investigation teams in small group sessions. Managers who commissioned the teams responded to a shortened version of the questionnaire. Responses to the questionnaire were coded by the researchers, reviewed by an industry specialist, and revised through an iterative process.

The researchers found that for teams in which the commissioning managers took an active role in the investigation, the managers tended to make decisions more in alignment with the team's recommendations, enhancing organizational learning. For those teams in which the managers did not take an active role, the managers tended make decisions that diluted and reduced the recommendations, limiting organizational learning. The implication drawn from this study is that decision-making processes that consider the experience, knowledge, and perspective of participants are more likely to result in decisions that positively influence organizational learning.

Strategy, as an element of organizational learning, is proposed to influence organizational identification by increasing salience and establishing the prototypical standards used by members to verify and exemplify social categories. Salience is an aspect of self-enhancement that helps members compare themselves as a group with other groups based on favorable attributes (Tajfel & Turner, 2004). As members match their organization to the context and determine accessibility and fit, strategies and goals are inputs that help members recognize the distinctive and central attributes of the organization. Strategies and goals provide partial answers to questions such as, "Who are we?" and "What business are we in?" and "Am I like we?" In addition, these inputs contribute to the development of a depersonalized prototype by providing a shared meaning for the existence of the group and a perception of togetherness in a common

purpose. The strategy element of organizational learning is the mechanism through which this common purpose is established, propagated, maintained, and changed over time.

Environment. Since the recognition of organizations as open systems, the recursive relationship between organizations and the environment has been a common topic of discussion in the literature (Crossan, Lane, & White, 2004; Daft & Weick, 1984; Katz & Kahn, 1978). The environment influences access to resources, opportunities, and threats and it both affects, and is affected by, organizational learning (Bapuji & Crossan, 2004). Over time, the organizational learning literature has been concerned with explaining the ways in which organizations collect, interpret, and act on this external information (Daft & Weick, 1984; Huber, 1991).

Huber (1991) described four components of organizational learning: knowledge acquisition, information distribution, information interpretation, and organizational memory. Knowledge acquisition includes the collection of information from the environment via five processes: congenital learning, experimental learning, vicarious learning, grafting, and searching and noticing. These knowledge acquisition processes describe the various ways in which organizations gather information about the environment. In particular, experimental learning is one of the ways by which organizations gather information for comparative evaluation and self-appraisal. Along with the other components of Huber's organizational learning model, comparative evaluation and self-appraisal are ways in which the organization and its members assess themselves relative to other organizations in the environment.

The organizational identification literature has also recognized a number of

environmental influences. For example, perceptions of construed external image and perceived organizational identity partially rely on external sources of information. A number of data sources contribute to these perceptions including media reports, rumors, conferences and other meetings, financial reports, etc. These sources are inputs to members as they categorize the attributes and distinctive characteristics that are used to develop depersonalized prototypes.

Organizational Learning Systems Model (OLSM)

Schwandt (1997) developed a model that integrates all four of the organizational learning mechanisms described in the previous sections in a system of action. The Organizational Learning Systems Model (OLSM) is based on Parsons' general theory of action (Parsons & Shils, 1952) and it integrates the psychological, social, and cultural aspects of organizations in four subsystems and a set of interchange media (Schwandt, 1997).

The general theory of action describes organizations as systems of social interactions that include actors as individuals, groups, or other collectives; situations, symbols, and rules; and norms and values (Schwandt & Marquardt, 2000). The general theory of action includes four subsystems that perform specific functions within the system. The subsystems are behavior, personality, culture, and social. The functions of these subsystems are adaptation, goal attainment, pattern maintenance, and integration, respectively. Adaptation is the function that interacts with the external environment to both acquire resources and shape the environment. The goal attainment function defines goals and the actions required to attain those goals. Integration establishes control and coordination between elements of the system. Pattern maintenance includes motivation,

symbolism, and culture (Schwandt & Marquardt, 2000).

Schwandt and Marquardt (2000) extended the general theory of action to develop an organizational learning system of actions. The four subsystems of the OLSM carry out the same functions as the four subsystems of the general theory of action, but with a focus on the organization and how it transforms information into valued knowledge. The four subsystems of the OLSM are meaning and memory (pattern maintenance function), dissemination and diffusion (integration function), action and reflection (goal attainment function), and environmental interface (adaptation function). The four subsystems of the model are functionally interdependent and related through interchange media.

The interchange media are the objects and symbols within the system that are manipulated by actors (Schwandt, 1997). The interchange media are new information (product of the environmental interface subsystem), goal-referenced knowledge (product of the action and reflection subsystem), structuration (product of the dissemination and diffusion subsystem), and sensemaking (product of the memory and meaning subsystem). Figure 2-1 depicts the organizational learning system model and Table 2-2 summarizes the subsystems and the interchange media.
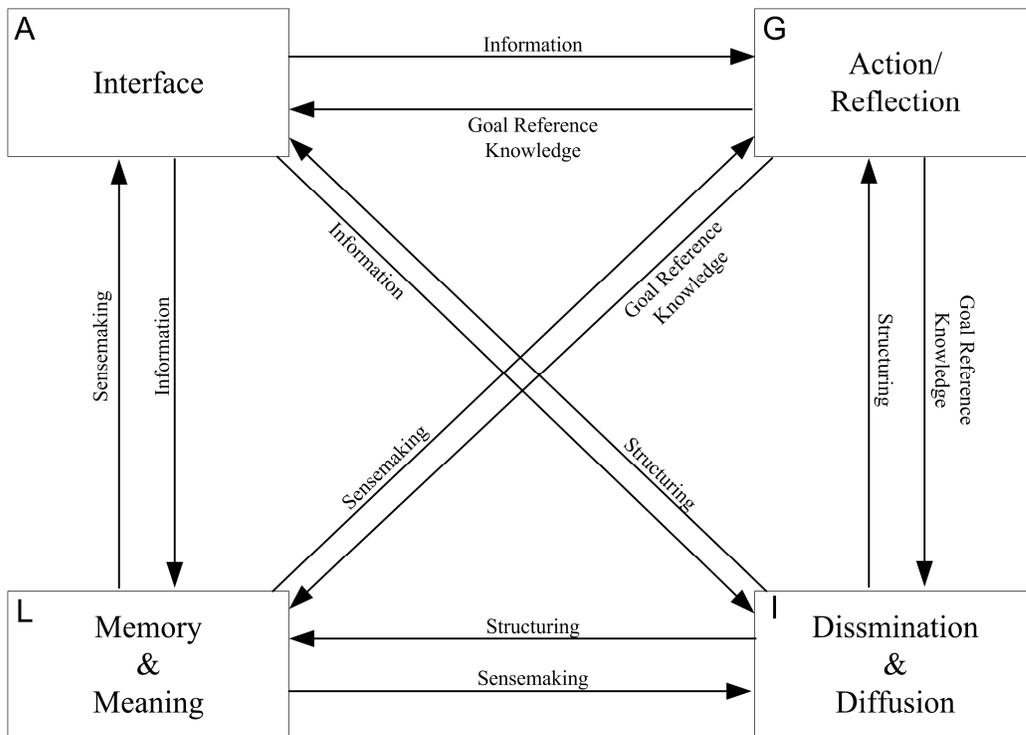
Figure 2-1 Organizational learning subsystems and interchange media relationships. Adapted from "Integrating Strategy and Organizational Learning," by D. R. Schwandt, 1997, Advances in Strategic Management, 14, p. 344.

Table 2-2 *OLSM subsystems and interchange media (Schwandt, 1997, p. 345)*

Subsystem	Interchange Media	Description
Environmental interface	New information	This subsystem relates the collective to its environment by securing, filtering, and expelling information and knowledge, both proactively and reactively. This subsystem also may enact the environment. New information is the output of this subsystem, which is used by the other subsystems to create knowledge.
Action and reflection	Goal-referenced knowledge	This subsystem includes the activities and actions used to accomplish the goals of the organizational learning system. These include routine actions and day-to-day operations described in standard operating procedures and non-routine actions directed at extraordinary events. Reflection may focus on processes, content, or underlying premises of the actions taken. Goal-referenced knowledge is produced through reflection on actions and activities.
Dissemination and diffusion	Structuration	This subsystem feeds information and knowledge to the other subsystems and includes communication, management coordination, social norms, and other actions. Dissemination includes purposeful actions governed by formal procedures and policies. Diffusion is informal and includes rumors and informal communication networks. Structuration is based on Giddens' (1984) concept of the mutual dependence of structure and agency and it includes patterns of structures, roles, policies, and processes.
Memory and meaning	Sensemaking	This subsystem is based on the concept that organizational learning is dependent on collective meanings and memories. This subsystem creates, sustains, and stores the cultural beliefs, values, assumptions, and artifacts of the collective through interpretive schema, language, social objects, and actions. Sensemaking is the product of the meaning and memory subsystem and is central to the defining and controlling function of the subsystem.

Summary of the Organizational Learning Literature

The organizational learning literature can be organized into a typology of mechanisms that includes the categories of culture, structure, strategy, and environment (Bapuji & Crossan, 2004). Culture incorporates the development of collective meaning, reduction of equivocality, and shared interpretations. Structure includes institutionalization, systems, routines, and customs. As Whetten (2007) says, "attributes of an organization . . . must be institutionalized, taken-for-granted, features of the organization, at any point in time" (p. 257). Strategy includes the goals, objectives, decisions, and plans that define the business of the organization for members. Finally, the environment influences access to resources, opportunities, and threats in a recursive relationship with the organization.

This literature review has indicated how the elements of culture, structure, strategy, and environment associated with organizational learning can be seen as factors that relate to organizational identification. A summary of the alignment between the organizational learning and organizational identification literature in the four categories is depicted in Table 2-3. Several authors have integrated all or some of these mechanisms in systems of organizational learning recognizing the interrelated and complex nature of the construct (Crossan, Lane, & White, 1999; Schwandt & Marquardt, 2000; Walsh & Ungson, 1991). Schwandt and Marquardt (2000) developed the OLSM, which incorporates all four mechanisms in a system of action.

Relationship Between Organizational Learning and Organizational Identification

Organizational identity and organizational identification have been explicitly linked to organizational learning and to aspects of organizational learning as manifested

in structures and systems, decision patterns, artifacts, culture, processes, practices, routines, logics, and strategies (Alvesson & Willmott, 2002; Ashforth, Harrison, & Corley, 2008; Brown & Starkey, 2000; Corley & Gioia, 2003; Dhalla, 2007; Kogut & Zander, 1996; Nag, Corley, & Gioia, 2007; Ravasi & Phillips, 2011; Ravasi & Schultz, 2006; Tripsas, 2009; Vough, 2011).

Organizational learning develops the distinctiveness of organizations in terms of capabilities and competitive advantage (Argote & Ophir, 2002). Distinctiveness is one of the criteria by which organizational members categorize groups (Ashforth & Mael, 1989). Child and Rodrigues (2003) view organizational learning as the mechanism by which organizational identity becomes salient, and is perceived to fit with the current and anticipated conditions of the organization, resulting in distinctive and bounded attributes that lead to identification of members with the organization. These distinctive and bounded attributes include the way in which external knowledge is used by the organization, the strategies and goals of the organization, and the practices implemented in the organization.

Ravasi and Phillips (2011) describe the way that leaders manage identity in organizations by ensuring that member identity beliefs are congruent with organizational identity. Identity claims are enacted in organizational policies, structures, and practices and identity management includes actions that focus members on identity referents such as information dissemination, reward structures, goal setting, and symbolic or ceremonial activities. These actions are designed to make the organization salient for members and to provide validation that the identity claims are consistent with the way in which the organization functions. These actions are consistent with organizational learning actions.

Corley and Gioia (2003) describe a mutually recursive relationship between organizational identity and a conceptualization of organizational learning that is based on intersubjective meaning embedded in action and social interaction within collectives such as structures, cultures, practices, behaviors. This relationship is adaptive for the organization in that its identity must be continuously maintained or re-learned through organizational learning in a changing environment. The development of intersubjective meaning provides a sense of continuity and consensus about the identity of the organization for its members. The implication of this relationship is that organizational learning, as a multilevel construct, relates to the cognitive understanding of organizational identity for organizational members, thus influencing identification.

Ashforth, Harrison, & Corley (2008) describe the recursive nature of identity concepts based on structuration theory and sensemaking. Likewise, Ashforth, Rogers, and Corley (2011) call for more cross-level research on identity, again drawing on structuration theory and sensemaking to argue that the focus should be on between-level rather than within-level dynamics. They say that enactment of identities at higher levels of analysis simultaneously constrain and enable the form and enactment of identities at lower levels, which also constrain and enable higher-level identities. Higher-level identities are enacted through goals, operating routines, information flows, and other institutionalized practices. This characterization of enactment is closely related to concepts of organizational learning and, in fact, the authors describe it as being similar to the 4I (i.e., intuiting, interpreting, integrating, and institutionalizing) model of organizational learning (Crossan, Lane, & White, 1999). Collective identity is interpreted by individual members through the enactment of organizational learning

69

processes such as goals, routines, and practices that provide a legitimate guide for understanding who the organization is and who members are in relation to the organization.

In summary, the link between organizational identification and organizational learning is typically described as an adaptive relationship in which organizational learning enables organizations to maintain, refocus, or transform identity in response to environmental changes and provides salient, sensegiving referents to members. Members are then able to interpret and make sense of who the organization is in terms of their own identity by incorporating these referents into their self-defined identities (Vough, 2011). Identification occurs as members align their own identities with the identity of the collective through their participation and enactment of structures, practices, and policies (Ravasi & Phillips, 2011).

Table 2-3 *Key concepts in organizational learning and organizational identification*

Organizational Learning		Organizational Identification	
<u>Reference</u>	<u>Key Concepts</u>	<u>Reference</u>	<u>Key Concepts</u>
Memory, Meaning, and Culture			
Daft & Weick (1984)	Organization viewed as an open system that interprets external knowledge to include reducing equivocality and ambiguity through shared interpretations and actions	Turner (1985)	Depersonalized prototypes are abstracted exemplars (symbols) of distinctive attributes
Walsh & Ungson (1991)	Culture is a memory retention facility that includes language, shared frameworks, symbols, stories, and rumors via shared interpretations	Dutton, Dukerich, & Harquail (1994)	Cultural forms such as rituals, symbols, ceremonies, and stories that develop shared patterns of behavior and interpretation influence identification
Fiol (1994)*	Consensus of frames rather than content, shared understanding of rules, and symbolic agreement facilitate action	Rousseau (1998)	Deep structure identification occurs based on meanings associated with resource exchanges within organizations
Schwandt (1997)	Memory and meaning function of organizational learning includes schema, language, objects, actions, beliefs, values, artifacts, and assumptions	Schrodt (2002)*	Culture is what a group learns over time, and it influences identification
Argote & Ophir (2002)	Organizational learning is the basis for development of distinctive capabilities that are meaningful to members	Cardador & Pratt (2006)	Symbols such as artifacts, stories, brands, images, events provide mechanisms for identity formation
Lant (2002)	Managers use actions and symbolic language to shape the interpretations of others	Kane (2010)*	Distinctive organizational features such as a collective name, symbol, purpose, or fate increase salience and identification

Organizational Learning		Organizational Identification	
Reference	Key Concepts	Reference	Key Concepts

<div align="center">Structures and Knowledge Distribution</div>

Organizational Learning		Organizational Identification	
Walsh & Ungson (1991)	Role behavior, rules, patterns of interaction, and structures are repositories of organizational memory that influence individual interpretations and actions	Bullis & Bach (1991)*	Diversity of communication links and participation in communication increases organizational identification
Schwandt (1997)	Structuring function of organizational learning includes communication, networks, coordination, actions, patterns, norms, policies, procedures, and processes	Smidts, Pruyn, & Van Riel (2001)*	Communication influences identification
Argote & Ophir (2002)	Personnel movement and structure influences identification, knowledge retention, and knowledge transfer	Morgan, Reynolds, Nelson, Johanningmeier, Griffin, & Andrade (2004)*	Policies, organizational forms, pay, benefits, and interaction influence organizational identification
Plaskoff (2003) Handley, Clark, Fincham, & Sturdy (2007)*	In situated learning theory, knowledge is embedded in artifacts, behavioral patterns, and actions that build identity	Olkkonen & Lipponen (2006)*	Perceptions of organizational justice (procedural and distributive) are significantly related to identification
Bapuji & Crossan (2004)	Structures, procedures, communication, and member stability affect learning	Cheung & Law (2008)*	Rewards, fairness in patterns of exchange (e.g., pay, promotion), communication about procedures, and recognition influence organizational identification
Kane, Argote, & Levine (2005)* Kane (2010)*	Empirical studies of influence of personnel rotation on social identity and knowledge transfer	Reicher, Haslam, & Hopkins (2005)*	Leadership influences identification by modeling prototypical members and making the ingroup salient

	Organizational Learning		Organizational Identification	
<u>Reference</u>	<u>Key Concepts</u>		<u>Reference</u>	<u>Key Concepts</u>
		Strategies and Goals		
Daft & Weick (1984)	Scanning and interpretation of the environment results in particular strategies and decision-making by the organization		Ashforth & Johnson (2001)	Mission, performance goals, operating principles, and strategies contribute to making salient attributes of the organization that influence identification
Schwandt (1997)	Action/Reflection function of organizational learning includes evaluations, decision-making, debates, conflicts, deliberations, strategy, goals		Kreiner & Ashforth (2004)*	Approach to strategies and goals can result in dysfunctional forms of organizational identification
Crossan, Lane, & White (1999)	Organizational learning is a means of achieving strategic renewal and is a multi-level phenomenon (individual, group, and organization) incorporating individual cognition, shared understanding, rules, procedures, and routines		Whetten (2007)	Involvement in articulation, enactment, and preservation of central, enduring, and distinctive attributes increases identification with the organization
Bettis & Wong (2003)	Dominant logics are highly durable and self-reinforcing visible features and invisible value systems that emphasize current goals, strategies, and structures		Edwards & Peccei (2007)*	Organizational identification is influenced by the extent to which the organization's goals and what it stands for are shared by the individual
Jarzabkowski (2008)	Individuals identify in relation to strategy and practices both provided and enacted		Bartels, Pruyn, De Jong, & Joustra (2007)*	Communication climate influences identification and content includes decision-making, performance goals, and adequacy of information

Organizational Learning		Organizational Identification	
<u>Reference</u>	<u>Key Concepts</u>	<u>Reference</u>	<u>Key Concepts</u>

Environment

Daft & Weick (1984)	Organizations are open systems that interface with the environment and perform scanning, interpreting, and learning (action)	Dutton, Dukerich, & Harquail (1994)	Construed external image is perceived by members as an evaluation of themselves which, if positive, creates a positive social identity
Huber (1991)	Organizations are open systems that scan, search, monitor, and notice the environment, including the perceptions of others about the organization	Bergami & Bagozzi (2000)*	Members "bask in the reflected glory" of the organization's high prestige to the extent that outsiders respect, admire, and know the organization
Schwandt (1997)	Environmental interface function of organizational learning includes scanning, collecting, and interpreting new data both proactively and reactively	Dukerich, Golden, & Shortell (2002)*	Individuals in organizations identify based on perceptions of how outsiders view the organization
Schulz (2002)	Recognizing relevance of new knowledge is an important aspect of knowledge evolution	Fuller, Marler, Hester, Frey, & Relyea (2006)*	Member beliefs about how outsiders view the organization influences organizational identification, moderated by self-esteem

*Denotes empirical studies

Chapter 3 Methodology

Overview

This chapter describes the research design and procedures used in this study. Specifically, it explains the research questions, study design, sampling approach, data collection procedures, research instruments, pilot testing, and data analysis.

Research Questions

The primary research question and subquestions that guided this study are listed below:

1. Do project team learning actions predict project team identification?

    a. Do project team meaning and memory learning actions predict project team identification?

    b. Do project team action and reflection learning actions predict project team identification?

    c. Do project team dissemination and diffusion learning actions predict project team identification?

    d. Do project team environmental interface learning actions predict project team identification?

Research Procedures

The following sections describe the design, setting, and sample used in this research study.

Research Design

This study used a quantitative research design to determine if project team learning actions predict project team identification. This study was conducted using a

convenience sample that typifies an organization that is structured by project teams.

Research Setting and Sample

The organization chosen for this study was an engineering and technical services organization of approximately 5200 employees. This organization was selected as the subject for this study because the majority of employees work in teams on complex, technical projects for external customers. Blindenbach-Driessen and Van Den Ende (2010) described project-based firms as firms that are organized by projects that produce complex integrated systems and knowledge-based services for clients.

The sampling frame used in this study was the company-maintained database of employees that was made available by the organization's vice president of human resources. The organization performs work for external customers and requires that each employee charge time worked to specific project codes for billing purposes. These codes were used to identify members of project teams. The database met the three criteria for selecting a sampling frame outlined by Alreck and Settle (2004): it was all-inclusive; it was exclusive because project team members could be isolated; and it listed the sample units at the two levels of measurement specified: individuals and project teams. The database was nearly 100% complete and accurate, with the exception of changes that occurred between when the list was accessed and when the survey was conducted. For example, some people had left the company in that time period and they were no longer part of their project teams.

The population was derived from this database by eliminating those who were not members of project teams performing customer work. Some employees perform corporate-level, internal functions and use a different set of project codes for entering

76

time worked. According to Maas and Hox (2005), one of the key issues in multilevel modeling is determining an appropriate sample size. Hofmann, Griffin, and Gavin (2000) reviewed the literature on sample size requirements for hierarchical linear models and concluded that to obtain sufficient power thirty groups of thirty individuals each, 900 individuals, are needed. They also determined that trade-offs are possible while still maintaining power such that a higher number of groups with fewer individuals, or a fewer number of groups with more individuals, are also acceptable. An oversampling approach was used in this study to increase the likelihood of obtaining the required sample size. A total of 2516 people were sent invitations to participate.

Data Collection

The following sections describe how the data for this study was collected including the administration of the survey and the instrumentation used.

Survey Administration

Data was collected using a web-based survey and communication with participants took advantage of corporate email capabilities. This approach is cost effective, simplifies participant responses, and eases data entry (Dillman, 2007). In this study, the participants primarily perform their daily work at computer workstations so being able to receive and complete the survey at their workstation was simple and convenient for them. Using email and web-based tools is cost effective compared to postal mail methods because postage costs are not incurred. Web-based surveys are more efficient compared to, for example, telephone surveys because simultaneous contact with multiple participants is possible. Web-based surveys also have the advantage of being able to reach a geographically dispersed population as easily as a local population. In this

study, participants were geographically dispersed across multiple time zones and using a web-based survey reduced the amount of time needed to conduct the survey. It also eliminated concerns about timing if a telephone survey had been used. In web-based surveys, participant response is simplified compared to paper surveys, assuming participants have fundamental computer skills, because there is no need to prepare a paper copy for mailing or make the effort to put it in the postal system. Participants in this study were known computer users and the majority could complete the survey at their workstation upon receipt. Using a web-based survey is also efficient for the researcher because the data are collected digitally, allowing for simplified manipulation and transfer to statistical analysis software packages. In this study, multiple software tools were used to conduct the analysis and digital data greatly simplified the process.

Pre-notifications, invitations, and follow-up messages were sent to participants to encourage participation and increase response rates (De Leeuw, Hox, & Dillman, 2008). To begin the data collection process, a courtesy email was sent to the sample project-team members from the senior vice president of human resources requesting participation (Appendix A).

The next day, another email (Appendix B) was sent to the project team members by the researcher introducing the researcher, requesting participation, and providing a link to the implied consent form and survey. The implied consent form (Appendix C) and the survey (Appendix D) were posted together on the website. After implied consent was given, instructions for the survey were provided and the participants proceeded to answer the survey questions. When the survey was completed, participants indicated they were done by clicking a button and responses were submitted electronically.

Four days after the initial request, a second request email (Appendix E) was sent encouraging those who had not yet responded to complete the survey. Because the goal was to keep the participant responses anonymous, this second email was sent to non-respondents using the automated reminder feature in Survey Monkey, which uses a non-attributable code to send email reminders to those who have not yet responded.

Three days after the second request, a third email (Appendix F) was sent politely urging responses from those who had not yet completed the survey. This email reiterated the importance of this survey for the organization and the fact that the study could not be completed without sufficient responses. Finally, four days after the third request, one last email (Appendix G) was sent requesting participation. Three days later, the survey was closed.

Survey Monkey has the ability to maintain the integrity of the level of analysis by tracking responses by project team. Essentially, a separate survey was created for each project team, which facilitated analysis and maintained anonymity. Survey Monkey stored the data collected by the survey and allowed for exporting of the data in various formats. The data was exported in Microsoft Excel file format (.xls), which could then be imported into other programs for statistical analysis.

Research Instrument

The data for this study was collected by combining 17 items from the OAS (Johnson, 2000) and the six items from the Mael and Ashforth (1992) scale, along with five control variable questions, for a total of 28 questions (Appendix D). The three sections were separated by specific instructions for answering the questions in that part of the instrument. The instrument items were reworded such that the subject of the

questions referred to the project team rather than organization where appropriate. All questions, except for some of the control variable questions, used a 5-point Likert scale. Permission to use these instruments was obtained from the developers.

Organizational identification measures. Mael and Ashforth (1992) developed the most widely used instrument for measuring organizational identification, known as the Mael and Ashforth scale (Edwards, 2005). This scale contains six items used to measure an individual's perceptions of oneness with the organization. The responses to the six items are averaged for a single identification score for each individual. All items from the six-item scale were used in this study and were reworded only to replace the term "organization" with "project team." These items were numbered 18-23 in the survey for this study.

Mael and Ashforth (1992) found the scale to be reliable, with a Cronbach's alpha of .87, in their study of 700 college alumni. Ge, Su, and Zhou (2010) sampled 500 employees from seven high-tech manufacturing enterprises in a major city in South China using a Chinese language version of the scale and found a reliability coefficient of .87. In several meta-analyses and reviews of the measurement of organizational identification, the Mael and Ashforth scale has been described as valid and reliable. Edwards (2005) reported that the Mael and Ashforth scale showed good reliability with an average alpha of .85 across six studies. In addition, Riketta (2005), in a meta-analysis of 96 studies of organizational identification, found an average reliability estimate of .84 for the Mael and Ashforth scale. Sample sizes were not reported in these meta-analyses.

Organizational learning measures. In this study, the organizational learning construct was based on the Organizational Learning System Model (OLSM) (Schwandt,

1997). The OLSM provides a complex and comprehensive view of how learning occurs across four dimensions within organizations. The OLSM is a systems model with four associated subsystems of learning actions: memory and meaning, environmental interface, action and reflection, and dissemination and diffusion. The OLSM also includes a performance aspect with four associated subsystems: exchange, production, reinforcement, and coordination.

The OAS (Johnson, 2000) is based on the OLSM (Schwandt, 1997) and was developed at the Center for the Study of Learning at The George Washington University. The OAS (Johnson, 2000) is a 36-item instrument that measures both performance and learning actions along the four subsystem dimensions. In this study, only the learning actions were examined, therefore the performance related items of the instrument were not used.

The learning portion of the OAS (Johnson, 2000) has four subsections that reflect the four subsystems of the OLSM (Schwandt, 1997). Each subsection contains questions specific to those subsystems. The survey questions in the instrument used in this study related to the subsystems as follows: memory and meaning questions were 1, 5, 7, 9, and 16; action and reflection questions were 6, 11, 12, and 17; dissemination and diffusion questions were 2, 10, 13, and 15; and environmental interface questions were 3, 4, 8, and 14. A total organizational learning score was calculated using the mean score for all learning items for each project team. Additionally, a rating for each of the four subsystems for each project team was calculated using the mean score across all members of each project team using only the items associated with each subsystem.

During the development of the instrument, Johnson (2000) calculated coefficient alphas for the four factors as follows: memory and meaning α=.74, action and reflection α=.64, dissemination and diffusion α=.81, and environmental interface α=.78. The sample size was 262 employees in a medium-sized, geographically dispersed, public sector health and engineering organization of 834 employees. Ba (2004) sampled 51 teams and 104 individuals in 21 organizations in Senegal and found Cronbach alpha coefficients for the four learning subsystems of the OAS (Johnson, 2000) as follows: memory and meaning α=.61, action and reflection α=.58, dissemination and diffusion α=.70, and environmental interface α=.73. Values of .70 are considered adequate, .80 very good, and .90 excellent (Kline, 2005). The low scores were not explained by the author but could be the result of using a translated version of the instrument and applying the instrument in a foreign culture. Others have also found the instrument to be reliable (Gorman, 2004; Hollandsworth-George, 2003; Hunte-Cox, 2004; Krishna, 2008; Vincent, 2006).

Control variable measures. The control variables were measured at both individual and project team levels. Individual level control variables include gender, age, and individual tenure on project teams. Gender and age are traditional control variables which have been found to be related to identification in past research (Kreiner & Ashforth, 2004). Gender was measured with a dichotomous variable with 0 = male and 1 = female. Age was measured via responses to a 5-point Likert scale question that grouped ages into categories: 1 = <25 years, 2 = 26-35 years, 3 = 36-45 years, 4 = 46-55 years, 5 = >55 years. Individual tenure on project teams is theorized to be related to identification because individuals remain in jobs with which they resonate and identify

more strongly over time (Kreiner & Ashforth, 2004). Individual tenure on project teams was also measured using a 5-point Likert scale that grouped years of tenure into categories: = <6 months on project team, 2 = <1 year on project team, 3 = 1-2 years on project team, 4 = 2-3 years on project team, 5 = >3 years on project team.

Project team level control variables included team size, occupational group within the organization, team tenure diversity, and virtualness. Team size was included as a control variable because smaller team sizes are theorized to provide more proximal references for identification and, conversely, large team sizes may provide more and different references for identification (Kreiner & Ashforth, 2004). Team size was measured by counting the number of team members on each project team. Occupational group was included as a control variable because studies have shown that managers or supervisors identify more strongly with employers because they are rewarded for it and because those who identify more strongly are more likely to be promoted into positions of management (Kreiner & Ashforth, 2004). Occupational group was measured with a survey question to determine position: 1= non-management, 2 = supervisor, 3 = professional, 4 = middle management, 5 = senior manager (VP or above). Team tenure diversity has been associated with identification (Van Der Vegt & Bunderson, 2005) and was measured using a calculation for a coefficient of variation based on the standard deviation of individual tenure scores divided by mean tenure for each project team. Virtualness is defined as the degree to which team members interact in face-to-face or virtual settings and is theorized relate to identification (Fiol & O'Connor, 2005). Virtualness was measured with a survey question that elicited responses about the

primary means of interaction with other team members: 1 = face-to-face, 2 = e-mail, 3 = telephone, 4 = very little interaction.

Instrument Testing

The instrument used for this study was tested to ensure clarity and consistency and to test the implementation of the web-based approach to administering the survey. Testing was conducted in two stages using the Campanelli (2008) stages of testing as a framework. In the first stage, question testing, the instrument was pretested using an expert panel with knowledge of the topic, the population, or survey methodology. The goal of this stage was to test instrument design and flow. In the second stage, pilot testing, the instrument was administered to a small sample similar to the targeted sample using the procedures as planned for the study. The goal of this stage was to test the survey under conditions as close as possible to the real study focusing on procedures and routines. The pilot test was used to determine if the survey instrument communicated to participants the intended information (Campanelli, 2008). The following sections describe these two stages in more detail.

Question Testing

Question testing was conducted using an expert panel of 16 members. The members of the panel included people with expertise in the topics of the study, the population targeted for the study, and the use of survey methodology in social science research. This test stage consisted of providing a copy of the survey in a form that approximated the final form. It was not administered via a web-enabled tool and it did not have the ability to electronically collect responses to the survey items. The purpose

of this stage was to obtain feedback on the look and feel of the survey, the instructions, and the questions.

The feedback received in the question testing stage focused on the scales for the items used in the survey, the specific wording of some of the instructions and questions, and some suggestions for additional responses that might be appropriate for the study. The feedback indicated that the length of the survey was appropriate. Most of the recommended changes were editorial in nature and did not substantively alter the survey instrument. The most significant revision resulted in a consistent approach to the item response scales for the different types of questions. These changes were implemented in a revised version of the survey.

The revised survey was transferred to the web-based survey administration tool, Survey Monkey. The tool necessitated some cosmetic changes that were not part of the original instrument used in the question testing stage, as well as some changes resulting from practical considerations related to web-based administration. For example, in the instrument used in the question testing phase the response choices appeared horizontally under the questions. In the web-based tool, the choices appear in a vertical list below the questions. In addition, aesthetically it was more appropriate to break the survey into pages that contained only the number of questions that would fit on a typical computer screen rather than requiring participants to keep scrolling down to access additional questions. Finally, an implied consent form was added to the instrument.

Pilot Testing

When the instrument was fully developed in Survey Monkey a pilot test was conducted with five people who were asked to participate from the perspective of

members of their own organizations or as they thought members of the target

organization might respond to the questions. The purpose of this stage of the testing was

to examine the implementation and procedures of the survey and to identify any issues

related to item responses received. Specific feedback about the survey was requested

from the participants including understanding of the instructions, clarity of questions, and

suggestions for improvements. The data collected in the pilot test was used to look for

any patterns or other characteristics that would indicate issues with the survey items.

The pilot test procedures worked properly and no feedback was received that

revealed any issues with the implementation. An email was sent to the participants

providing information about the pilot and requesting participation. The email also

included the hyperlink that brought participants directly to the implied consent form part

of the survey. Upon agreeing to the consent form, participants were then taken to the

survey. All the procedures worked properly and were easily understood by the

participants.

The pilot test revealed some specific areas for improvement including the need for

more clarity about the purpose of the survey and the benefit to the participants, some

additional concerns about the scales, and specific wording in some of the questions.

Generally, the feedback was focused on minor modifications to add clarity or consistency

and no major issues were identified. The data collected from the pilot test did not reveal

any disturbing patterns or internally inconsistent responses.

The two stages of testing accomplished the goal of improving the clarity and

consistency of the instrument and ensuring the proper implementation of the web-based

administration of the survey. The feedback received during the testing process was

considered and incorporated as appropriate. The testing confirmed that the survey

instrument communicated to participants the intended information (Campanelli, 2008).

After revisions, the instrument contained 28 items, most of which used a 5-point Likert

scale. The pilot test took participants approximately 10 minutes to complete.

Data Analysis

The following sections describe the data analysis procedures and techniques used

in this study.

Preliminary Data Handling

Preliminary data handling includes the procedures and techniques followed to

ensure the integrity and accuracy of the data. The following sections describe the

preliminary data handling procedures and techniques used in this study.

Data entry and storage. Data collected in this study was gathered and stored

initially in the Survey Monkey tool. Survey Monkey has the capability to digitally

collect, store, filter, and report survey data. In addition, it is capable of exporting data in

a variety of formats including Comma Separated Values (.csv) and Microsoft Excel (.xls)

which can then be imported into statistical processing software applications. Access to

the Survey Monkey data files was password-protected, as were the downloaded data files,

which were stored on the researcher's password-protected personal computer account.

The files were also backed up to an external hard drive after they were downloaded from

Survey Monkey to protect against data loss in the event of technical difficulties.

Missing data. Survey Monkey tools were used initially to view the data and

check for conditions such as incomplete surveys. The tools provided summary

information about the survey as well as a graphical interface to inspect the collected data.

Summary information included data such as the number of completed surveys and total number of questions answered, which provided an initial view of non-response. After the files were exported to Microsoft Excel format (.xls) they were again visually inspected for errors and missing data before importation into statistical processing software applications. Microsoft Excel provides a tabular view of the data that is different from the graphical view provided by Survey Monkey and revealed additional non-responses. The data were also inspected for response set bias by visually scanning responses from individuals for patterns of answers.

Data transformation. The data as collected was transformed to provide the insight defined by the research questions. The OAS (Johnson, 2000) was that portion of the instrument that measured project team learning and consisted of a total project team learning score and four separate subsystem scores of multiple items each: environmental interface, action and reflection, dissemination and diffusion, and memory and meaning. Using the Survey Monkey feature that allows tracking of responses by project team, individual participant responses to the OAS items were combined into mean total project team scores and scores for each subsystem for analysis. Organizational identification was measured within this study's instrument using the six items from the Mael and Ashforth (1992) scale. A mean score for identification was calculated for each participant. Reverse scoring was not necessary because the scales used were similar for all the survey items in that the least desirable responses were located at the lower end of the scales and the most desirable responses were at the higher end of the scales. Items were equally weighted.

Response rate. The sampling frame for this study contained up-to-date contact

information because it was based on the current employee roster for the company. Contact information is maintained in the employee account system and employee email addresses, which are assigned during the employee orientation period at the beginning of employment with the company, do not change. Potential for non-response existed if, for example, an employee left the company just before the survey was distributed and the records were not updated at the time the sampling frame was produced. A minimal number of invitations were undelivered, either because the person was no longer an employee or because the email address was incorrect for some reason. The exact reason was impossible to determine. To mitigate non-response, an initial cover letter was emailed to each of the sample project-team members explaining the purpose of the survey and urging participation. The email also informed members that they should expect additional emails from the researcher.

Another issue that could have affected response rate was the fact that in some work locations access to company email and the Internet is limited. This condition could have affected the amount of time it would take for participants to actually receive the email. Once received, it may have been inconvenient or impossible for the participants to complete the survey at that particular time. Allowances were made for these types of response delays in the schedule by spacing out reminder emails over a period of weeks.

The survey instrument included demographic questions which were evaluated against company maintained demographic data to determine if the responsive participants were representative of the organization. Specifically, the data was analyzed to determine if responses were geographically dispersed and that multiple business units within the

company were represented. Because almost all the teams invited to participate were included in the analysis, the respondents were representative of the company.

Reliability. The Cronbach's alpha coefficient is a measure of the internal consistency or reliability of an instrument or factors within an instrument (Hox, 2008). Values of .70 are considered adequate, .80 very good, and .90 excellent (Kline, 2005). Cronbach's alpha coefficients were calculated to check the internal consistency of the survey instrument and measure the reliability of the organizational learning factors and organizational identification within the instrument. The Cronbach's alpha calculations for each of the four OAS (Johnson, 2000) factors were compared to the reliability measures of Johnson (2000) in the initial test of reliability and validity of the instrument and to other studies that have used this instrument. For the items measuring identification, Cronbach's alpha calculations from this study were also compared with Mael and Ashforth's (1992) alpha calculations and with other studies of identification using this scale from the literature. Results of this analysis can be found in Chapter 4.

Statistical Analysis

This section describes how the collected data was analyzed. The data analysis proceeded in three stages. First, descriptive statistics were calculated using SPSS including means, standard deviations, frequencies, percentages, and Cronbach's alpha coefficients. Correlations were calculated as an initial test of the relationships between the variables. Second, between-group differences were calculated to assess the group-level effects using hierarchical linear modeling (HLM) techniques. Third, HLM analysis was used to test the hypotheses and understand the relationships between the variables. A Windows-based software program, HLM 7.0, was used to conduct the HLM analyses.

HLM has been proposed as an approach for examining relationships that cross levels of analysis (Hofmann, Griffin, & Gavin, 2000). In the analysis of cross-level models there are three possible approaches. The first approach, disaggregation, involves assigning scores from the higher-level variable to the lower-level unit and then using ordinary least squares regression analysis. This approach violates the statistical assumption of independence of observations of the ordinary least squares regression approach because the associated random errors include both group-level and individual-level components (Hofmann, Griffin, & Gavin, 2000; Maas & Hox, 2005). The second possible approach is to aggregate the lower-level variable measurements to the higher-level unit. This approach ignores individual-level variance, resulting in the loss of potentially significant findings. These first two approaches are also vulnerable to committing the fallacy of the wrong level and the ecological fallacy. The fallacy of the wrong level consists of drawing conclusions about data at a different level than that at which it was analyzed. The ecological fallacy is interpreting aggregated data at the individual level (Hox, 1995). In addition, traditional techniques face limitations of aggregation bias, misestimated precision, and unit of analysis issues (Raudenbush & Bryk, 2002). The third approach, HLM, was developed to address the limitations of the disaggregation and aggregation approaches by explicitly including both the higher-level and lower-level random errors. According to Ashmore, Deux, and McLaughlin-Volpe (2004), the influence of contextual elements such as social structures, patterns of interaction, and shared beliefs on identification should be examined using hierarchical linear models.

HLM can be thought of as a two-stage process that first examines the lower-level variables (level 1) and then examines the higher-level variables (level 2) (Hofmann, Griffin, & Gavin, 2000). This study included two levels of analysis: level 1 was the individual member and level 2 was the project team. These levels and their associated variables are shown in Table 3-1. Because the data collected was measured at two different levels in a nested arrangement (individuals within project teams), hierarchical linear modeling was used to answer the research questions because it is an integrated approach that results in more accurate estimation (Raudenbush & Bryk, 2002).

Table 3-1 *Multilevel nature of the research questions*

Level 1	Level 2
Individual	Project Team
Member identification	Project team learning actions
	Project team memory and meaning learning actions
	Project team dissemination and diffusion learning actions
	Project team action and reflection learning actions
	Project team environmental interface learning actions

In organizational research, zero values for variables often are not meaningful. For example, it is meaningless for a project team to have zero learning actions. In hierarchical linear modeling, alternative scaling to center variables is used to ensure meaningful results. There are three types of scaling that can be used that result in different interpretations of the intercept term (Hofmann & Gavin, 1998). Raw score, or uncentered, variables result in an intercept term equal to the expected value of the

dependent variable when the independent variable is zero. Raw scores are used for dichotomous variables for which centering is itself meaningless. In this study, the individual level control variable, gender, was coded with a 0 for male, and a 1 for female. Centering this variable has no meaning and it was left in the raw score format in the analysis. Group mean centering results in an intercept term that is equal to the expected value of the dependent variable for an individual whose value on the independent variable is equal to the group mean. Grand mean centering results in an intercept term that is equal to the expected value of the dependent variable for an individual whose value on the independent variable is equal to the mean across all individuals in the sample. Grand mean centering is appropriate when the research interest is in understanding how group level variables predict individual outcomes after controlling for individual level variables, which is the nature of this study. Grand mean centering also reduces problems with collinearity. All variables with the exception of gender were centered around the grand mean.

The intitial step in testing the hypotheses was to conduct the equivalent of a one-way analysis of variance (ANOVA) (Hofmann, Griffin, & Gavin, 2000), also called the null or unconditional model (Raudenbush & Bryk, 2002). This test determines the amount of between-group variance in the dependent variable. In this study, project team identification is hypothesized to vary by project team based on the level of project team learning within each group. Therefore, it is necessary to establish that there are differences in project team identification by project team. Statistical significance of this test indicates that differences in project teams effect project team identification and further analysis is justified. Also as a result of this test, the Intraclass Correlation

Coefficient, or ICC(1), was calculated to determine the proportion of total variance that could be explained by project team membership.

The five hypotheses to be tested in this study using HLM were derived from the research questions:

Hypothesis 1

Hypothesis H_{01}: Project team learning actions do not predict project team identification.

Hypothesis H_{a1}: Project team learning actions predict project team identification.

Hypothesis 2

Hypothesis H_{02}: Project team meaning and memory learning actions do not predict project team identification.

Hypothesis H_{a2}: Project team meaning and memory learning actions predict project team identification.

Hypothesis 3

Hypothesis H_{03}: Project team action and reflection learning actions do not predict project team identification.

Hypothesis H_{a3}: Project team action and reflection learning actions predict project team identification.

Hypothesis 4

Hypothesis H_{04}: Project team dissemination and diffusion learning actions do not predict project team identification.

Hypothesis H_{a4}: Project team dissemination and diffusion learning actions

predict project team identification.

Hypothesis 5

Hypothesis H_{05}: Project team environmental interface learning actions do not

predict project team identification.

Hypothesis $H_{\alpha5}$: Project team environmental interface learning actions predict

project team identification.

These hypotheses and the HLM testing model are depicted in Figure 3-1.
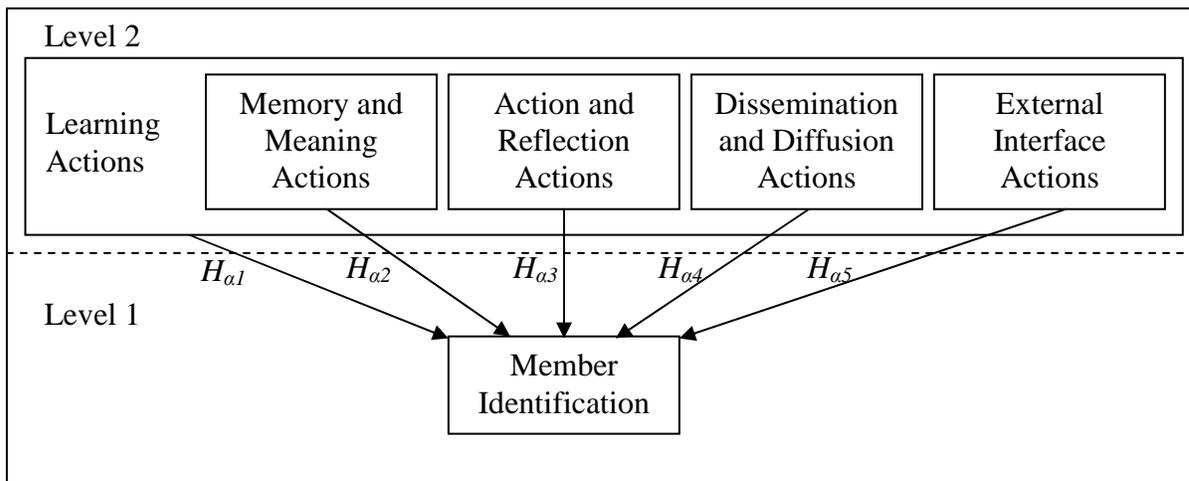
Figure 3-1 Hypotheses measurement model using HLM

The instrument used to measure project team learning contains five separate

scales. One scale is a total project team learning score and the other four scales measure

each of the four learning subsystems separately. The hypothesis testing approach used in

this study was directly aligned with these five instrument subscales and the research

questions. The first hypothesis, and the first HLM model to be built, consisted of testing

the relationship between total project team learning and project team identification, which

is the basic purpose of this study. This first model could be considered the complete

model, because it includes all four of the project team learning subsystems. If a relationship was found to exist in this first HLM model, the next steps were to understand the relationship between each of the four subsystems and project team identification, which are represented by hypotheses 2-5. These relationships were examined by building a model for each to determine the direct relationship between the individual subsystem and identification. Since the subsystems are contained in the total project team learning score, they were evaluated separately in the subsequent models. Other approaches to conducting the HLM analysis were possible, however, this approach most directly addressed the research questions.

Human Participation and Ethics

The ethical concerns associated with this survey were minimal. Participants were asked for their consent to participate in the study and were informed that their participation was voluntary. If responses were publicly revealed and associated with the participants, there was some risk that the information could cause trauma to the participants within the work setting if it were used against them. Therefore, responses to the survey were anonymous and the data collected was kept confidential. SurveyMonkey was used to conduct the survey and has features that protect anonymity, making it impossible for responses to be traced to individual participants. In addition, SurveyMonkey requires a secure login procedure to use and access the tool and only the researcher was authorized access to the survey data. After downloading the data from SurveyMonkey, password protection was used to ensure the security of the data and prevent unauthorized access. Data backups also incorporated this protection scheme.

This research study was examined by the Institutional Review Board of The George

Washington University and deemed to have less than minimal risk for participants.

Chapter 4 Analysis and Results

Overview

The analysis began with an evaluation of the response rate and a check for missing data. In this study, 2516 individuals in 73 project teams received invitations to participate. In total, 1273 individuals in 72 project teams responded, a response rate of 50.1%. According to Dillman (2007), an ideal response rate for a web-based survey is 80% but that rate is difficult to obtain. The average response rate is 30% (Punch, 2003). Listwise deletion was used to eliminate incomplete surveys. Listwise deletion, also known as complete-case analysis, is an approach to handling missing data in which all cases with at least one missing item are deleted from the analysis (Rässler, Rubin & Schenker, 2008). After listwise deletion was performed, 1100 respondents on 72 project teams ranging in size from 2 to 77 remained for analysis.

Scherbaum and Ferreter (2009) address the issue of statistical power in multilevel modeling based on the unique factors relevant in multilevel research. Power is defined as the probability of correctly rejecting a false null hypothesis. Power calculations for multilevel models are more complex than single level designs because the assumption of independence is violated in multilevel models. In addition, although power computations assume a balanced design (i.e., project teams with equal numbers of individuals), the authors state that the assumption of a balanced design is not critical in estimating statistical power and minimum or average sample sizes within each group may be used in the calculations. For this study, a post hoc power analysis was conducted using the actual survey results in the following equations:

$$\text{var}(\gamma_{01}) = 4(\rho + (1-\rho)/n)/J$$

98

$$S.E.(\gamma_{01}) = var(\gamma_{01})^{1/2}$$

Where:

J = number of project teams, 72

n = number of individuals in the smallest project team, 2

ρ = ICC(1), .02

γ_{01} = fixed effects for the slope term in Level 2 equation for the Level 1 intercept

var = variance

S.E. = standard error

The standard error can then be entered into the following equation, along with an estimate of effect size, to solve for the z value, which is then used to estimate power.

$$Z_{1-\beta} \leq \text{Effect Size/Standard Error} - Z_{1-\alpha/2}$$

Where:

Effect Size = .5

$Z_{1-\beta}$ = z score associated with the level of statistical power

$Z_{1-\alpha/2}$ = z score associated with the chosen level of a Type 1 error (.05), 1.96

For this study, the z value is calculated to be 1.01, which yields an estimate of statistical power of .84.

Variables

Table 4-1 describes the variables used in the equations shown in this section. Individual level control variables included gender, age, and individual tenure on project teams and are identified as GENDER, AGE, and TENURE respectively in Table 4-1. Gender was measured with a dichotomous variable with 0 = male and 1 = female. Age was measured via responses to a 5-point Likert scale question that grouped ages into categories: 1 =

<25 years, 2 = 26-35 years, 3 = 36-45 years, 4 = 46-55 years, 5 = >55 years. Individual

tenure on project teams was also measured using a 5-point Likert scale that grouped years

of tenure into categories: 1 = <6 months on project team, 2 = <1 year on project team, 3

= 1-2 years on project team, 4 = 2-3 years on project team, 5 = >3 years on project team.

Project team level control variables included team size (TEAMSIZE),

occupational group within the organization (OCCGROUP), team tenure diversity

(TENUREDIV), and virtualness (VIRTUAL). Team size was measured by counting the

number of team members on each project team. Occupational group was measured with

a survey question to determine position: 1= non-management, 2 = supervisor, 3 =

professional, 4 = middle management, 5 = senior manager (VP or above). Team tenure

diversity was measured using a calculation for a coefficient of variation based on the

standard deviation of individual tenure scores divided by mean tenure for each project

team. Virtualness is defined as the degree to which team members interact in face-to-

face or virtual settings and was measured with a survey question that elicited responses

about the primary means of interaction with other team members: 1 = face-to-face, 2 = e-

mail, 3 = telephone, 4 = very little interaction. Project team learning actions

(LEARN_MEAN) was the mean total project team learning score. Memory and meaning

learning actions (MM_TEAM), action and reflection learning actions (AR_TEAM),

dissemination and diffusion learning actions (DD_TEAM), and environmental interface

learning actions (EI_TEAM) were the mean team scores for each of the project team

learning subsystems.

Table 4-1 *Description of study variables*

Variable	Description

IDENT	Dependent variable measuring individual level of project team identification.
GENDER	Level 1 control variable measuring gender of respondents.
AGE	Level 1 control variable measuring age of respondents.
TENURE	Level 1 control variable measuring the amount of time spent on the project team.
TEAMSIZE	Level 2 control variable measuring the size of each project team.
OCCGROUP	Level 2 control variable measuring the hierarchical position in the company.
VIRTUAL	Level 2 control variable measuring extent of virtualness of project teams according to the most common type of interaction among project team members.
TENUREDIV	Level 2 control variable measuring the coefficient of variation of tenure within teams.
LEARN_MEAN	Independent variable measuring project team learning actions.
MM_TEAM	Independent variable measuring memory and meaning learning actions.
AR_TEAM	Independent variable measuring action and reflection learning actions.
DD_TEAM	Independent variable measuring dissemination and diffusion learning actions.
EI_TEAM	Independent variable measuring environmental interface learning actions.

Response Demographics

Table 4-2 presents a summary of the response demographics for this study.

Table 4-2 *Summary of response demographics*

Variable	Results
Gender	75.9% male, 24.1% female
Age	<25 years: 3.7%
	26-35 years: 21.3%
	36–45 years: 21.5%
	46-55 years: 34.6%
	> 55 years: 18.8%
Tenure	< 6 months on project team: 7.5%
	< 1 year on project team: 14.1%
	1-2 years on project team: 18.1%
	2-3 years on project team: 13.1%
	> 3 years on project team: 47.2%
Occupational group	Non-management: 54.6%
	Supervisor: 17.1%
	Professional: 19.8%
	Middle management: 7.8%
	Senior management (VP or above): .6%
Virtualness	Face-to-face: 66.7%
	E-mail: 27.1%

Telephone: 2.3%

I rarely interact with other project team members: 3.9%

Descriptive Statistics

Table 4-4 presents the means, standard deviations, reliabilities, and correlations

for this study. Correlations provided the initial tests of the hypotheses in this study. The

table shows that project team identification was correlated with project team learning

actions (r = .11, *p* < .01), memory and meaning learning actions (r = .38, *p* < .01),

dissemination and diffusion learning actions (r = .14, *p* < .01), action and reflection

learning actions (r = .36, *p* < .01), and environmental interface learning actions (r = .31, *p*

< .01). According to Hinkle, Wiersma, and Jurs (2003), correlations of .90 to 1.00 (-.90

to -1.00) indicate a very high positive (negative) correlation, .70 to .90 (-.70 to -.90)

indicate a high positive (negative) correlation, .50 to .70 (-.50 to -.70) indicate a moderate

positive (negative) correlation, .30 to .50 (-.30 to -.50) indicate a low positive (negative)

correlation, and .00 to .30 (.00 to -.30) indicate little positive (negative) correlation.

These results indicate that a low positive relationship exists between identification and

memory and meaning learning actions, action and reflection learning actions, and

environmental interface learning actions, and little relationship between identification and

dissemination and diffusion learning actions and project team learning actions. These

results provide minimal preliminary support for hypotheses H$_{a2}$, H$_{a3}$, and H$_{a5}$ and weak, if

any, support for hypotheses H$_{a1}$ and H$_{a4}$. In addition, team size (r = -.07, *p* < .05) and

virtualness (r = -.15, *p* < .01) were shown to be weakly negatively correlated with project

team identification. These correlations indicate that the larger the team size and the more

virtual the team, the less individuals identified with the team. Occupational group (r =

.14, $p < .01$) was weakly positively correlated with project team identification, meaning

that those more senior in the hierarchy identified more with project teams. These

correlations are preliminary and do not provide strong evidence for the hypothesized

relationships.

Cronbach's alpha is an estimate of reliability of a survey instrument (Hox, 2008).

Comparison of Cronbach's alpha scores between this study and previous studies using the

same scales are shown in Table 4.3 along with the scores for this study. Values of .70 are

considered adequate, .80 very good, and .90 excellent (Kline, 2005).

Table 4-3 *Comparison of Cronbach's alpha scores for the survey instruments*

Measure		Study			
	This study	Mael and Ashforth (1992)	Ge, Su, and Zhou (2010)	Edwards (2005)	Riketta (2005)
Identification scale	.80	.87	.87	.85	.84
			Study		
		Johnson (2000)	Ba (2004)	Hunte-Cox (2004)	Krishna (2008)
OAS	.94	-	-	-	.87
Memory/meaning	.82	.74	.61	.70	.77
Dissem/diffusion	.81	.81	.70	.77	.75
Action/reflection	.77	.64	.58	.62	.72
Env interface	.74	.78	.73	.71	.73

Table 4-4 *Study variable means, standard deviations, reliabilities, and correlations*

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender[a]	.24	.43	-												
2. Age[b]	3.44	1.13	-.05	-											
3. Tenure[c]	3.78	1.36	-.01	.27**	-										
4. Team size	63.92	61.75	-.07*	.17**	-.07*	-									
5. Occ. Group[d]	1.83	1.04	-.09**	.15**	.17**	-.03	-								
6. Virtualness[e]	1.43	.73	.04	.08**	.02	.07*	.01	-							
7. Tenure diversity[f]	.33	.13	-.03	-.11**	-.37**	.20**	-.08**	.01	-						
8. Identification	4.12	.70	.01	-.01	-.01	-.07*	.14**	-.15**	.00	-					
9. Team learning	3.19	.26	-.02	-.14**	-.06*	-.22**	.01	-.08**	.04	.11**	-				
10. Meaning/memory	3.44	.78	.02	-.11**	-.04	-.09**	.08**	-.18**	.01	.38**	.31**	-			
11. Dissem/diffusion	3.16	.38	.00	-.10**	-.08**	-.03	.09**	-.14**	.02	.14**	.30**	.79**	-		
12. Action/reflection	3.25	.89	-.02	-.09**	-.07*	-.06*	.09**	-.14**	.01	.36**	.33**	.78**	.83**	-	
13. Environmental interface	2.92	.80	.01	-.13**	-.09**	-.10**	.06*	-.12**	.03	.31**	.33**	.75**	.74**	.73**	-

* $p < .05$.
** $p < .01$.
N = 1100.
[a] Gender was coded: male = 0, female = 1.
[b] Age was coded: 1 = <25 years, 2 = 26-35 years, 3 = 36-45 years, 4 = 46-55 years, 5 = >55 years.
[c] Tenure was coded: 1 = <6 months on project team, 2 = <1 year on project team, 3 = 1-2 years on project team, 4 = 2-3 years on project team, 5 = >3 years on project team.
[d] Occupational group was coded: 1= non-management, 2 = supervisor, 3 = professional, 4 = middle management, 5 = senior manager (VP or above).
[e] Virtualness was coded: 1 = face-to-face, 2 = e-mail, 3 = telephone, 4 = very little interaction.
[f] Tenure diversity was calculated as the standard deviation of tenure scores divided by mean tenure for each project team.

<center>**Hypothesis Testing**</center>

Hierarchical linear modeling (HLM) was used to examine the hypotheses. HLM is appropriate for the analysis of hierarchically nested data structures, in this case, individuals within project teams. A Windows-based software program, HLM 7.0, was used to conduct the analysis.

Null Model

The first step in testing the hypotheses using hierarchical linear models was to conduct the equivalent of a one-way analysis of variance (ANOVA) (Hofmann, Griffin, & Gavin, 2000), also referred to as the null or unconditional model (Raudenbush & Bryk, 2002). The purpose of this test is to determine the amount of between-group variance in the dependent variable. In this study, project team identification is hypothesized to vary by project team based on the level of project team learning within each group. Therefore, it is necessary to establish that there are differences in project team identification by project team. This relationship is represented by the following equations:

Level 1: $IDENT_{ij} = \beta_{0j} + r_{ij}$

Level 2: $\beta_{0j} = \gamma_{00} + u_{0j}$

Combined equation: $IDENT_{ij} = \gamma_{00} + u_{0j} + r_{ij}$

Where:

j = project team

i = member of project team, j

β_{0j} = intercept of project team identification for project team, j

γ_{00} = grand mean project team identification

Variance $(r_{ij}) = \sigma^2$ = within-group variance in project team identification

<center>106</center>

Variance $(u_{0j}) = \tau_{00}$ = between-group variance in project team identification

In the level 1 equation, there are no predictors and, therefore, there is no slope in the linear equation. The equation only includes an intercept term for the regression, which is equal to the mean for each group, β_{0j}. The variance in the level 1 equation, r_{ij}, is within-group variance. The level 2 equation then uses the group means, β_{0j}, to calculate the mean of the group means, or grand mean for project team identification, γ_{00}. The variance in the level 2 equation, u_{0j}, is the between-group variance. Members of the same project team are more likely to be similar to each other and different from members of other project teams because they live and work in the same areas and share common purpose. HLM 7.0 provides a chi-square significance test of the unconditional model including the variance components. Significance indicates that differences in project teams effect project team identification and further analysis is justified.

The results of this one-way ANOVA, shown in Table 4-5, indicate that project team identification varied significantly across project teams, $\chi^2 = 97.49$, $p < 0.05$, ICC(1) $= 0.02$. The ICC(1) is a calculation of the ratio of the variance between units of analysis (project teams) to the variance within units of analysis (individuals): $\tau_{00}/(\tau_{00} + \sigma^2)$. It is the proportion of total variance that can be explained by project team membership and typically ranges from 0.0 to 0.30 (Bliese, 2000; Raudenbush & Bryk, 2000). Although the ICC(1) value in this study is small it is statistically significant and, according to Bliese (2000), ICC(1) values based on Likert scale items rarely reach 0.30 and are often much lower because of range restrictions associated with such scales. Low magnitude values have still been found to be important in understanding group effects. Non-zero

values for the ICC(1) indicate that "group membership affects or is related to lower-level observations" (Bliese, 20000, p. 358). In this study, the non-zero ICC(1) value indicates that project team membership accounts for some of the between team variation in project team identification. Based on this analysis of the null model and the significance of the one-way ANOVA, additional models were constructed to test the hypotheses.

Table 4-5 *HLM results of the null model*

Fixed effect	Coefficient	Standard error	t	df	p-value
Intercept	4.13	0.03	163.90	71	<.001***

Random effect	Variance component	Standard deviation	χ^2	df	p-value
Between project team, u_{0j}	0.01	0.10	97.49	71	0.02*
Within project team, r_{ij}	0.48	0.69			

N= 1100. J=72.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$

Control Variables

In this study there are control variables at both level 1 and level 2. These control variables were entered into the model in two steps.

Level 1 control variables. In the first model, the three individual level (level 1) control variables were modeled using the following equations.

Level 1: $IDENT_{ij} = \beta_{0j}+\beta_{1j}*(GENDER_{ij})+\beta_{2j}*(AGE_{ij})+\beta_{3j}*(TENURE_{ij})+ r_{ij}$

Level 2: $\beta_{0j} = \gamma_{00} + u_{0j}$

$\beta_{1j} = \gamma_{10}$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

Combined equation: $IDENT_{ij} = \gamma_{00} + \gamma_{10}*GENDER_{ij} + \gamma_{20}*AGE_{ij} + \gamma_{30}*TENURE_{ij} + u_{0j} + r_{ij}$

Where:

j = project team

i = member of project team, j

β_{0j} = intercept of project team identification for project team, j

γ_{00} = grand mean project team identification

γ_{10} = mean of gender regression slopes across groups

γ_{20} = mean of age regression slopes across groups

γ_{30} = mean of tenure regression slopes across groups

Variance $(r_{ij}) = \sigma^2$ = within-group variance in project team identification

Variance $(u_{0j}) = \tau_{00}$ = between-group variance in project team identification

As shown in Table 4-6, none of the level 1 control variables were found to be statistically significant (gender: $\gamma_{10} = 0.02$, *ns*; age: $\gamma_{20} = -0.00$, *ns*; tenure: $\gamma_{30} = 0.00$, *ns*) and were removed from the model.

Table 4-6 *HLM results of the level 1 control variables*

Variable	Coefficient	*SE*	*t*	*df*	*p*-value
Intercept	4.13	0.03	144.56	71	<.001***
Individual control (level 1)					
Gender	0.02	0.06	0.32	1025	0.75

Age	-0.00	0.02	-0.00	1025	0.99
Tenure	0.00	0.02	0.14	1025	0.89

N= 1100. J=72.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$

Level 2 control variables. The four project team level control variables (level 2)

were added to the model using the following equations.

Level 1: $IDENT_{ij} = \beta_{0j} + r_{ij}$

Level 2: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(TEAMSIZE_j) + \gamma_{02}*(OCCGROUP_j) + \gamma_{03}*(VIRTUAL_j)$

$+ \gamma_{04}*(TENUREDIV_j) + u_{0j}$

Combined equation: $IDENT_{ij} = \gamma_{00} + \gamma_{01}*TEAMSIZE_j + \gamma_{02}*OCCGROUP_j +$

$\gamma_{03}*VIRTUAL_j + \gamma_{04}*TENUREDIV_j + u_{0j} + r_{ij}$

Where:

j = project team

i = member of project team, j

β_{0j} = intercept of project team identification for project team, j

γ_{00} = grand mean project team identification

γ_{01} = mean of team size slopes

γ_{02} = mean of occupational group slopes

γ_{03} = mean of virtualness slopes

γ_{04} = mean of tenure diversity slopes

Variance $(r_{ij}) = \sigma^2$ = within-group variance in project team identification

Variance $(u_{0j}) = \tau_{00}$ = between-group variance in project team identification

Team size was significantly negatively related to project team identification ($\gamma_{01} =$ -0.01, $p < 0.01$), indicating that the larger the project team, the lower the project team identification. The other team level control variables were not statistically significant (occupational group: $\gamma_{02} = 0.04$, *ns*; virtualness: $\gamma_{03} = 0.01$, *ns*; and tenure diversity: $\gamma_{04} = 0.12$, *ns*) and were removed from the model. These results are depicted in Table 4-7.

Table 4-7 *HLM results of the level 1 and level 2 control variables*

Variable	Coefficient	*SE*	*t*	*df*	*p*-value
Intercept	4.14	0.03	167.36	67	<.001***
Team control (level 2)					
Team size	-0.01	0.01	-2.71	67	0.01**
Tenure diversity	0.12	0.016	0.75	67	0.46
Occupational group	0.04	0.02	1.81	67	0.08
Virtualness	0.01	0.03	0.24	67	0.81

N= 1100. J=72.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$

Hypothesis 1 Testing

The next type of model to be built included a level 2 predictor variable and is referred to as an intercepts-as-outcomes model. In this study, five separate intercepts-as-outcomes models were built to test the five hypotheses. The first model was used to determine if project team learning actions as a total score predicted project team identification. If the null hypothesis, H_{01}, was supported, further hypothesis testing

would not be necessary. If the alternative hypothesis, H_{a1}, was supported, further hypothesis testing would be justified. Further hypothesis testing would determine whether each of the project team learning subsystems of the OLSM predict project team identification. This model used the following equations.

Level 1: $IDENT_{ij} = \beta_{0j} + r_{ij}$

Level 2: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(TEAMSIZE_j) + \gamma_{02}*(LEARN\_MEAN_j) + u_{0j}$

Combined equation: $IDENT_{ij} = \gamma_{00} + \gamma_{01}*TEAMSIZEj + \gamma_{02}*LEARN\_MEAN_j + u_{0j} + r_{ij}$

Where:

j = project team

i = member of project team, j

β_{0j} = intercept of project team identification for project team, j

γ_{00} = grand mean project team identification

γ_{01} = mean of team size slopes

γ_{02} = mean of project team learning slopes

Variance $(r_{ij}) = \sigma^2$ = within-group variance in project team identification

Variance $(u_{0j}) = \tau_{00}$ = between-group variance in project team identification

The HLM results for hypothesis 1, shown in Table 4-8 revealed that project team learning actions are significantly positively related to project team identification ($\gamma_{02} = 0.28$, $p < 0.01$), controlling for team size. Team size was no longer statistically significant after adding project team learning to the model ($\gamma_{01} = -.01$, *ns*), indicating that

in the presence of high project team learning scores, team size is not a relevant factor in identification. Hypothesis 1 is therefore supported by the data. Having established that project team learning is related to project team identification, the next steps were to test the remaining hypotheses to understand the relationship of each project team learning subsystem to project team identification. Since each of the four subsystems are contained within the total project team learning variable, for each test of hypotheses 2-5, the independent variables were added individually in the models to avoid overlap.

Table 4-8 *Project team learning and project team identification*

Variable	Coefficient	*SE*	*t*	*df*	*p*-value
Intercept	4.14	0.03	167.02	69	<.001***
Team control (level 2)					
Team size	-0.01	0.01	-1.55	69	0.13
Team variables (level 2)					
Project team learning	0.28	0.09	3.25	69	0.002**

N= 1100. J=72.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$

Hypothesis 2 Testing

Hypothesis 2 proposed that the memory and meaning project team learning actions predict project team identification using the following equations.

Level 1: $\text{IDENT}_{ij} = \beta_{0j} + r_{ij}$

Level 2: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(\text{TEAMSIZE}_j) + \gamma_{02}*(\text{MM\_TEAM}_j) + u_{0j}$

Combined equation: $\text{IDENT}_{ij} = \gamma_{00} + \gamma_{01}*\text{TEAMSIZE}_j + \gamma_{02}*\text{MM\_TEAM}_j + u_{0j} + r_{ij}$

Where:

j = project team

i = member of project team, j

β_{0j} = intercept of project team identification for project team, j

γ_{00} = grand mean project team identification

γ_{01} = mean of team size slopes

γ_{02} = mean of memory and meaning slopes

Variance $(r_{ij}) = \sigma^2$ = within-group variance in project team identification

Variance $(u_{0j}) = \tau_{00}$ = between-group variance in project team identification

The results of this test are depicted in Table 4-9. The results show that memory and meaning learning actions are significantly positively related to project team identification ($\gamma_{02} = 0.27$, $p < 0.01$) after controlling for team size. Team size was no longer statistically significant after adding memory and meaning learning actions to the model ($\gamma_{01} = -.01$, *ns*), indicating that in the presence of high memory and meaning learning scores, team size is not a relevant factor in identification. Hypothesis 2 is therefore supported by the data.

Table 4-9 *Memory and meaning learning actions and project team identification*

Variable	Coefficient	*SE*	*t*	*df*	*p*-value
Intercept	4.13	0.03	148.62	69	<.001***
Team control (level 2)					
Team size	-0.01	0.01	-1.44	69	0.16

114

Team variables (level 2)

Memory and meaning learning	0.27	0.09	3.10	69	0.003**

N= 1100. J=72.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$

Hypothesis 3 Testing

Hypothesis 3 proposed that the dissemination and diffusion project team learning actions predict project team identification. This hypothesis was modeled using the following equations.

Level 1: $IDENT_{ij} = \beta_{0j} + r_{ij}$

Level 2: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(TEAMSIZE_j) + \gamma_{02}*(DD\_TEAM_j) + u_{0j}$

Combined Equation: $IDENT_{ij} = \gamma_{00} + \gamma_{01}*TEAMSIZE_j + \gamma_{02}*DD\_TEAM_j + u_{0j} + r_{ij}$

Where:

j = project team

i = member of project team, j

β_{0j} = intercept of project team identification for project team, j

γ_{00} = grand mean project team identification

γ_{01} = mean of team size slopes

γ_{02} = mean of dissemination and diffusion slopes

Variance $(r_{ij}) = \sigma^2$ = within-group variance in project team identification

Variance $(u_{0j}) = \tau_{00}$ = between-group variance in project team identification

The results of this test are depicted in Table 4-10. The results show that dissemination and diffusion learning actions are significantly positively related to project team identification ($\gamma_{02} = 0.22$, $p < 0.01$) after controlling for team size. Hypothesis 3 is therefore supported by the data. In addition, team size was significantly negatively related to project team identification ($\gamma_{02} = -0.01$, $p < 0.05$), suggesting that team size remains relevant even if dissemination and diffusion learning actions are present.

Table 4-10 *Dissemination and diffusion learning and project team identification*

Variable	Coefficient	*SE*	*t*	*df*	*p*-value
Intercept	4.14	0.03	168.33	69	<.001***
Team control (level 2)					
Team size	-0.01	0.01	-2.00	69	0.05*
Team variables (level 2)					
Dissemination and diffusion learning	0.22	0.09	2.60	69	0.01**

N= 1100. J=72.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$

Hypothesis 4 Testing

Hypothesis 4 proposed that the action and reflection project team learning actions predict project team identification. This hypothesis was modeled using the following equations.

Level 1: $\text{IDENT}_{ij} = \beta_{0j} + r_{ij}$

Level 2: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(\text{TEAMSIZE}_j) + \gamma_{02}*(\text{AR\_TEAM}_j) + u_{0j}$

Combined Equation: $IDENT_{ij} = \gamma_{00} + \gamma_{01}*TEAMSIZE_j + \gamma_{02}*AR\_TEAM_j + u_{0j} + r_{ij}$

Where:

j = project team

i = member of project team, j

β_{0j} = intercept of project team identification for project team, j

γ_{00} = grand mean project team identification

γ_{01} = mean of team size slopes

γ_{02} = mean of action and reflection slopes

Variance $(r_{ij}) = \sigma^2$ = within-group variance in project team identification

Variance $(u_{0j}) = \tau_{00}$ = between-group variance in project team identification

The results of this test are depicted in Table 4-11. The results show that action and reflection learning actions are significantly positively related to project team identification ($\gamma_{02} = 0.22$, $p < 0.001$) after controlling for team size. Team size was not statistically significant after adding action and reflection learning actions to the model ($\gamma_{01} = -.01$, *ns*), indicating that in the presence of high action and reflection learning scores, team size is not a relevant factor in identification. Hypothesis 4 is therefore supported by the data.

Table 4-11 *Action and reflection learning and project team identification*

Variable	Coefficient	*SE*	*t*	*df*	*p*-value
Intercept	4.14	0.03	168.10	69	<.001***
Team control (level 2)					

Team size	-0.01	0.01	-1.69	69	0.10
Team variables (level 2)					
Action and reflection learning	0.22	0.06	3.61	69	0.001***

N= 1100. J=72.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$

Hypothesis 5 Testing

Hypothesis 5 proposed that the environmental interface project team learning actions predict project team identification. This hypothesis was modeled using the following equations.

Level 1: $IDENT_{ij} = \beta_{0j} + r_{ij}$

Level 2: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(TEAMSIZE_j) + \gamma_{02}*(EI\_TEAM_j) + u_{0j}$

Combined Equation: $IDENT_{ij} = \gamma_{00} + \gamma_{01}*TEAMSIZE_j + \gamma_{02}*EI\_TEAM_j + u_{0j} + r_{ij}$

Where:

j = project team

i = member of project team, j

β_{0j} = intercept of project team identification for project team, j

γ_{00} = grand mean project team identification

γ_{01} = mean of team size slopes

γ_{02} = mean of environmental interface slopes

Variance $(r_{ij}) = \sigma^2$ = within-group variance in project team identification

Variance $(u_{0j}) = \tau_{00}$ = between-group variance in project team identification

The results of this test are depicted in Table 4-12. The results show that environmental interface learning actions are significantly positively related to project team identification ($\gamma_{02} = 0.24$, $p < 0.01$) after controlling for team size. Team size was not statistically significant after adding environmental interface learning actions to the model ($\gamma_{01} = -.01$, *ns*), suggesting that team size is not related to identification when external interface learning actions are present. Hypothesis 5 is, therefore, supported by the data.

Table 4-12 *Environmental interface learning and project team identification*

Variable	Coefficient	*SE*	*t*	*df*	*p*-value
Intercept	4.13	.03	163.28	69	<.001***
Team control (level 2)					
Team size	-0.01	0.01	-1.43	69	0.16
Team variables (level 2)					
Environmental interface	0.24	0.09	2.72	69	0.01**
learning					

N= 1100. J=72.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$

Summary of Analysis and Results

This chapter presented the analysis and results of the current research study exploring the relationship of project team learning actions to project team identification. A total of 1100 individuals in 72 teams were included in the analysis. The power analysis resulted in an estimate of statistical power of .84. The majority of respondents were male (75.9%), were over 46 years old (53.4%), had spent more than 2 years on their

project team (60.3%), were non-management (54.6%), and interacted with other project team members primarily face-to-face (66.7%).

The grand mean score for project team identification was well above the median (M = 4.12, SD = .70) and the mean scores for project team learning and the subscales were also above the median (project team learning: M = 3.19, SD = .26; memory and meaning: M = 3.44, SD = .26; dissemination and diffusion : M = 3.25, SD = .32; action and reflection: M = 3.16, SD = .27) with the exception of environmental interface (M = 2.92, SD = .29).

Results of correlation analysis revealed preliminary support for three of the five hypotheses because three of the independent variables indicated a low but statistically significant correlation with project team identification: memory and meaning learning actions (r = .38, *p* < .01), action and reflection learning actions (r = .36, *p* < .01), and environmental interface learning actions (r = .31, *p* < .01). The remaining two independent variables showed only little correlation, even though the results were statistically significant: project team learning actions (r = .11, *p* < .01) and dissemination and diffusion learning actions (r = .14, *p* < .01). In addition, Cronbach's alpha scores for the instruments used in this study were adequate (action and reflection subscale: .77; environmental interface subscale: .74), very good (identification instrument: .80, memory and meaning subscale: .82; dissemination and diffusion subscale: .81) and excellent (project team learning: .94) (Kline, 2005).

Figure 4-1 summarizes the results of hypothesis testing using HLM for this study. The results indicated a positive and significant relationship between project team learning

and its subsystems and project team identification. In chapter 5 these results are

discussed in terms of implications for theory, research, and practice.
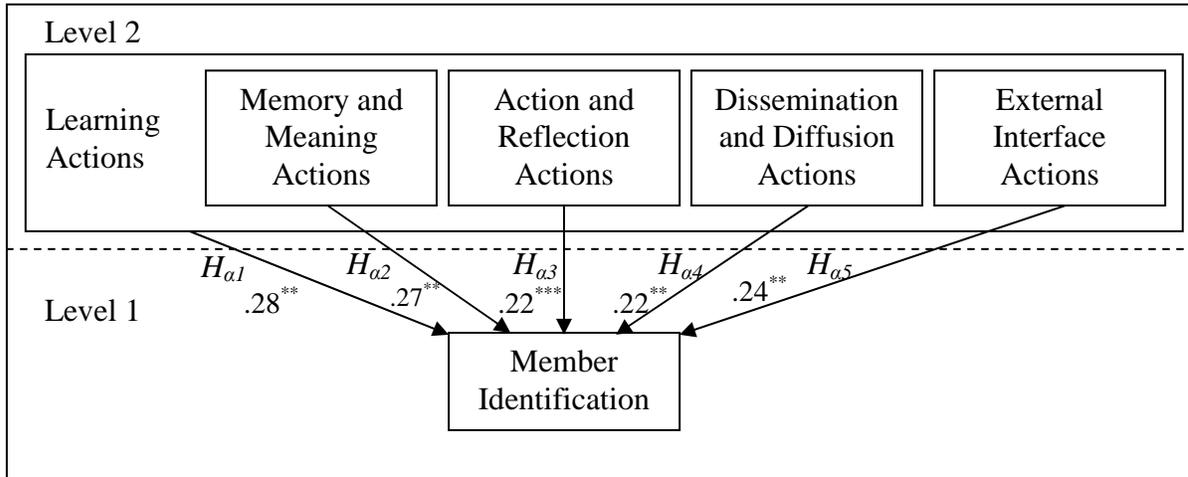
** $p < .01$.
*** $p < .001$

Figure 4-1 Summary of hypothesis testing results based on HLM analysis

Chapter 5 Interpretations, Conclusions, and Recommendations

This chapter presents the interpretations, conclusions, and recommendations of this study, organized in the following way. The chapter begins with an overview of the study, the purpose, the research questions, and the study design. The findings are then summarized. Next, the findings are interpreted in the context of theory, research, and practice on organizational identification and organizational learning. Then conclusions are presented in relationship to the findings and the literature. Finally, the limitations and recommendations for future study are discussed.

Overview

This study explored the relationship between project team learning and project team identification to understand if identification can be fostered in such a way that positive outcomes are enhanced and negative outcomes are mitigated (Ashforth, Harrison, & Corley, 2008). Based on the literature review, the conceptual framework was formed and two instruments were selected for use in the study. The Organizational Action Survey (OAS) (Johnson, 2000) was selected to measure organizational learning based on the Organizational Learning Systems Model, which is grounded in Parson's general theory of action (Schwandt, 1997). The Mael and Ashforth scale, which is the most widely used identification scale in the literature, was selected to measure identification. While originally developed to measure the constructs at the organizational level of analysis, both of these instruments have been used in studies of collectives other than organizations such as work groups, departments, and project teams. The survey instruments were administered using a web-based survey tool, Survey Monkey, and a convenience sample of project teams within a single organization. Because the Mael and

Ashforth scale measures identification at the individual level of analysis, and the OAS measures learning at the collective level of analysis, multilevel modeling was the appropriate approach to use for analysis. The software tools Microsoft Excel, PASW Statistics 18, and HLM 7.0 were used to conduct the analysis.

The primary research question and subquestions guiding this study were:

1. Do project team learning actions predict project team identification?

   a. Do project team meaning and memory learning actions predict project team identification?

   b. Do project team action and reflection learning actions predict project team identification?

   c. Do project team dissemination and diffusion learning actions predict project team identification?

   d. Do project team environmental interface learning actions predict project team identification?

Summary of Findings

This section summarizes the findings of this study. The results indicated that all five hypotheses were supported.

Hypothesis 1

- There is a statistically significant but little positive correlation between project team learning actions and project team identification.

- Project team learning actions predict project team identification based on HLM analysis.

Hypothesis 2

- There is a statistically significant but low positive correlation between project team meaning and memory learning actions and project team identification.

- Project team meaning and memory learning actions predict project team identification based on HLM analysis.

Hypothesis 3

- There is a statistically significant but low positive correlation between project team action and reflection learning actions and project team identification.

- Project team action and reflection learning actions predict project team identification based on HLM analysis.

Hypothesis 4

- There is a statistically significant but little positive correlation between project team dissemination and diffusion learning actions and project team identification.

- Project team dissemination and diffusion learning actions predict project team identification based on HLM analysis.

Hypothesis 5

- There is a statistically significant but low positive correlation between project team environmental interface learning actions and project team identification.

- Project team environmental interface learning actions predict project team identification based on HLM analysis.

<center>**Interpretations**</center>

This study establishes the relationship between project team learning actions and project team identification, which has numerous theoretical, empirical, and practical implications.

Theoretical Implications

This study contributes to theory in both organizational learning and organizational identification. The empirical results of this study provide support for a new lens through which to view organizational identification by incorporating a systems view of organizations and the cross-level relationship between organizational and contextual factors and individuals, which expands and strengthens understanding of organizational identification. The following sections describe the theoretical implications of this study, organized as follows. First, the contribution to theory on organizational and contextual influences on organizational identification is discussed. Next, the implications of this study for theory on the multilevel nature of the constructs used in this study are described. The final section describes implications regarding the organizational learning system model and organizational identification as used in this study. These implications are then summarized.

<center>**Organizational and contextual influences on organizational identification.**</center>

This study supports theoretical conceptions of organizational learning as a contextual and organizational influence that enables and constrains lower level phenomena (Crossan, Maurer, & White, 2011; Schwandt, 1997). In this study, project team learning is the contextual and organizational influence and project team identification is the lower level phenomenon. It also answers recent calls for researchers to pay attention to

<center>125</center>

organizational and contextual factors that are related to identification. Haslam, Jetten, Postmes, and Haslam (2009) say that it is important to understand "the way in which social contextual factors determine individuals' internalization of particular social identities" (p. 7). Whetten (2007) says that "organizational actions affect both the meaning and salience of organizational memberships" (p. 259). He describes recent calls for conceptions of identification that include relevant contextual factors such as size, composition, leadership, and cultural norms. This study contributes to understanding of these types of relationships.

This study furthers the investigation of how organizational and contextual factors relate to identification by using the integrated framework and systems perspective of the OLSM, which provides insight into the multidimensional nature of the relationship. Several scholars have proposed and examined individual aspects of this relationship. For example, Prati, McMillan-Capeheart, and Karriker (2009) theorize that a clan culture that emphasizes cohesiveness and participation influences organizational identification. Using Mael and Ashforth's (1992) definition of organizational identification, the authors contend that culture provides the context for sensemaking and that managerial actions and culture influence identification. While they also incorporate other influences such as leadership, communication, involvement in problem solving, and sharing of decision-making information, this study adds value because it is grounded in an established theory of collective behavior that integrates multiple aspects of collective action (Casey, 2005).

Fiol and O'Connor (2005) contend that identification occurs not in a vacuum but within the contextual situation. Many studies of identification do not consider the influence of relevant contextual factors. By incorporating a social systems perspective in

the conceptual framework, this study recognizes the "interrelated systems of actions emanating from the individual, group, and organizational levels" (Schwandt, 1997, p. 341). Systems of action provide rich context for identification to occur. This study contributes to theory on the contextual and organizational influences on organizational identification because it integrates numerous separate models into a coherent, parsimonious system of action that more directly accounts for the complex patterns of social systems (Schwandt, 1997).

The results of this study contribute to understanding of the systems view of organizational learning actions and their relationship to organizational identification because all four of the organizational learning subsystems predicted identification. If, as Prati, McMillan-Capeheart, and Karriker (2009) propose, culture was of singular importance as a contextual factor influencing identification, then the expectation for this study would be that the memory and meaning subsystem would have had a much stronger relationship with identification than the other subsystems, but this was not the case. All four of the subsystems contribute contextual cues and sensemaking referents to individuals as they try to make sense of the organization and their place within it.

Multilevel nature of organizational phenomena. This study explicitly recognizes the cross-level nature of the relationship between institutionalized learning actions and an individual's sense of oneness with the organization. The theoretical contribution of this approach to the multilevel nature of organizational phenomena is that it addresses the context of social interactions that define limits, expectations, norms, and other conditions within which identification occurs. Specifically, the theoretical basis for this study incorporates a fundamental concept common to both organizational

identification and organizational learning: the merger of the individual and the collective.

The organizational learning model used in this study is based on Parsons' general theory of action (Schwandt, 1997). At the heart of the theory of action are four subsystems: behavior, social, culture, and personality. Within these systems, individual tendencies based on biographical and historical background are merged with meanings, values, and beliefs that are institutionalized within the system. This merger results in motivations and orientations based on self-enhancement, self-esteem, and need for group membership, as the actor becomes one with the organization (Bluth, 1982). This study pairs this foundational idea of organizational learning with one of the fundamental concepts of social identity theory: the depersonalized prototype.

In the social identification literature, specifically self-categorization theory, the development of a depersonalized prototype is the transformational shift in perceptions of the self as a unique person to that of an interchangeable exemplar of a social category. The attributes that are transformed during this shift include beliefs, attitudes, feelings, and behaviors that are formed through social interaction and the development of shared meanings. As the attributes of the depersonalized prototype are formed, they also reduce uncertainty for individuals by providing a guide for the norms and expectations of the collective as individuals enact the depersonalized prototype (Hogg & Terry, 2001). Based on this theoretical foundation, this study indicates that the depersonalized prototype is formed through a system of organizational learning that integrates the structural, cultural, external, and goal-oriented influences that merge with the individual's biographical and historical background.

Several models of organizational learning incorporate the idea of a merger between individual experience and institutionalized aspects of organizations. For example, Crossan, Lane, and White (1999) describe how personal streams of experience (intuiting) become merged with others through words and actions (interpreting) and the development of shared understanding (integrating). As the actions and interactions become more coordinated, they are institutionalized as systems, structures, procedures, and strategies. Furthermore, these processes work in both feedforward and feedback loops as bottom-up emergence and top-down influence (Crossan, Maurer, & White, 2011).

In the interpreting process, individual understandings become shared understandings as common languages, clarified images, and shared meanings are developed and equivocality is reduced. This process results in changes in individual understanding and actions as individuals attempt to enact shared meanings within the constraints of organizational and contextual factors (Crossan, Lane, & White, 1999). Schwandt (1997) describes a similar process taking place in the memory and meaning subsystem. This subsystem includes the interpretive schema and human interactions that develop the beliefs, values, assumptions, and artifacts of the organization. Sensemaking, as the media of interchange for the memory and meaning subsystem, occurs as individuals interact within the organization and develop shared meanings that are influenced by organizational and contextual elements through the interchange media of the other subsystems.

For example, Ashforth, Harrison, and Corley (2008) describe organizational identification as an emergent process of sensemaking that is influenced by actions

intended to guide meaning construction. They also say that sensemaking and

identification are the result of enactment, which is defined as the social performance of

actions that conform to the beliefs, norms, and acceptable behaviors of the organization.

Through enactment, individuals make sense of the organization and themselves within it,

allowing identification to occur. Vough (2011) says that individual identification occurs

as sensemaking based on, among other things, values, culture, norms, understanding of

work, and shared characteristics. This process may also be dysfunctional, resulting in

conflict and turmoil.

Using a theoretical model based on a system of action, as in this study, provides a

way to examine collective level influences in a coherent and systematic way that is also

supported by the identification literature. Project team learning actions provide the

enablers and constraints within which the interpretation of meaning and sensemaking

occur. They also provide the acceptable norms, rules, patterns, and interaction behavior

about which judgments of enactment performance are evaluated and individuals make

meaning of themselves within the collective. Implications regarding the specific ways in

which the organizational learning subsystems are theorized to be related to organizational

identification follow in the next section.

Organizational learning systems model and identification. The use of the

organizational learning system model and its subsystems in this study has theoretical

implications for both organizational learning and organizational identification. These

implications are discussed in the following sections and are based on the findings from

the HLM analysis. Specifically, the following sections are based on the statistically

significant, positive relationships found between the subsystem learning actions of the OLSM and project team identification.

Action and reflection subsystem. As a theoretical contribution, the relationship of the action and reflection subsystem to identification supports both social identity theory and identity theory. In the OLSM, institutionalization occurs through learning actions within the four learning subsystems. The action and reflection subsystem includes the activities and actions used to accomplish the goals of the learning system including standard operating procedures, strategies, goals, and decision-making and the output is goal referenced knowledge (Schwandt, 1997). The literature on organizational identification indicates that clarity of goals, and other strategic and managerial elements that provide direction for the organization, develop the salience of the collective and increase understanding of roles for individuals in ways that reduce uncertainty and influence identification (Ashforth & Mael, 1989; Ashmore, Deux, & McLaughlin-Volpe, 2004; Stets & Burke, 2000). The survey questions in this study asked about the extent to which project teams had clear goals for business and personal development and how well ideas are shared within the team structure. The higher the levels of these learning actions in the project teams, the higher the identification. These aspects of the project teams in this study contribute to individual perceptions of distinctiveness and judgment, reduce uncertainty, and set expectations (Hogg & Terry, 2001).

More specifically, the depersonalized prototype of self-categorization theory describes and prescribes attributes of the ingroup related to ambiguous, complex perceptions of the environment (Hogg & Terry, 2001). Based on the OLSM, the strategies, goals, and decision-making that are part of the action and reflection subsystem

order the complex environment for members of project teams. Additionally, the positive relationship between action and reflection learning actions and identification found in this study indicates that understanding and participating in the strategies, goals, and decisions of the group increases the sense of self-enhancement and self-efficacy in individuals. This relationship supports the need for project team members to act as causal agents that add value within the group and improve perceptions of the group relative to other groups (Stets & Burke, 2000; Tajfel & Turner, 2004)

This study also contributes to theory on the expanded model of organizational identification (Kreiner & Ashforth, 2004). As described in detail in Chapter 2, the authors found that aspects of substantive and symbolic management were not significantly related to organizational identification, but that a lack of consistent substantive and symbolic management was significantly related to ambivalent identification and disidentification. Substantive management includes actions consistent with the action and reflection subsystem such as decision making, practices, involvement, and role expectations. Although the variables and instruments used in that study were different from this study, the results of this study partially support their findings since the relationship between action and reflection learning actions and project team identification was relatively weak compared to the memory and meaning and environmental interface subsystems.

Dissemination and diffusion subsystem. The dissemination and diffusion subsystem feeds information and knowledge to the other subsystems and includes organizational roles, leadership, structure, communication, management coordination, and social norms (Schwandt & Marquardt, 2000). Dissemination is formal and

132

encompasses purposeful actions governed by procedures and policies. Diffusion is informal and includes rumors and informal communication networks. Structuration, as the output of the dissemination and diffusion subsystem, is based on Giddens' (1984) concept of the mutual dependence of structure and agency and it includes patterns of structures, roles, policies, and processes.

The most obvious reason that the dissemination and diffusion subsystem is related to identification is that structure is an element of this subsystem. From an identification perspective, structure delineates and defines social categories, in this case project teams, and determines the ingroup and outgroups in social contexts (Pratt, 2001). Ingroups are the groups of which people see themselves as members and whose members are similar to themselves. Outgroups have members who are different from the ingroup (Pratt, 2001). Ashforth and Mael (1989) considered organizations and organizational subgroups as special types of social categories.

The roles, social norms, and leadership within this subsystem help to reduce uncertainty for individuals as they try to understand who they are in relation to the collective (Hogg & Terry, 2001). The uncertainty reduction hypothesis in social identity theory states that uncertainty is reduced by two distinct types of influence: informational and normative. Informational influence includes the acceptance of ideas and explanations of others regarding ambiguous and complex perceptions of the situation. Normative influence is the conformance to socially acceptable expectations based on a need for acceptance and approval.

In this study, in the dissemination and diffusion subsystem, leadership provides the informational influence and roles and social norms provide the normative influence.

Individuals look to leaders to explain and defend the actions of the organization and their appropriateness in any given situation. Leadership shapes and guides the social identity of individuals (Reicher, Haslam, & Hopkins, 2005). Roles and social norms define and describe both formally and informally how people should act. They provide meaning, set expectations, and define aspects of the depersonalized prototype (Hogg, Sherman, Dierselhuis, Maitner, & Moffitt, 2007).

These relationships can also be characterized as sensegiving and sensebreaking influences that affect and guide sensemaking (Ashforth, Harriston, & Corley, 2008). Sensegiving involves providing inputs that help develop shared understandings of how things are done. Sensebreaking may occur during times of change and creates gaps between individuals and organizations in terms of identity that cause exploration and motivation to close the gaps. These influences mold and develop identification. This characterization of the process of identification is supported by this study because in the OLSM the interchange media of the subsystems are inputs for each other. The environmental interface, action and reflection, and dissemination and diffusion subsystems provide inputs to the memory and meaning subsystem and sensemaking is the output.

The findings of this study regarding the relationship of the dissemination and diffusion subsystem to identification also strongly support the basic premise of identity theory: roles have a significant influence on the way people perceive themselves in social environments. Roles are associated with particular norms, expectations and behaviors that are based on shared understandings and they include factors such as power and status.

The roles and structures of the dissemination and diffusion subsystem also support the concept of salience as defined in identity theory. Salience in identity theory is based on the quantitative and qualitative nature of structural ties that individuals have within organizations. Salience depends on both the number of others to which a person is related as well as the strength and depth of those relationships. In this study, the structural elements of the dissemination and diffusion subsystem are directly related to identification. In addition, the fact that the majority of team members interacted face-to-face and the majority of team members had been on their project teams for more than three years may also contribute to the relationship. Face-to-face meetings not only develop the structural ties but also can make those ties stronger through direct interaction. The relatively long tenure of individuals on project teams helps to solidify and strengthen relationships over time. Another possible explanation for the significant relationship between the dissemination and diffusion subsystem and identification in this study is that the majority of respondents were non-managers in technical roles and possibly the confounding aspects of status, power, and hierarchy were not particularly relevant to the respondents.

Finally, self-efficacy and self-enhancement in identification refer to the motivational aspect of identification as members act to align themselves with the prototypical member. Self-efficacy is the belief in the ability to act as a causal agent toward positive outcomes in concert with the expectations, values, and standards of behavior established within the social category. In this study, the relationship found between the dissemination and diffusion subsystem and identification is theorized to be

grounded in the expectations, values, and standards of behavior that are defined by leadership, social norms, role expectations, and other actions of the subsystem.

Given the strength of the theoretical support for the relationship of the dissemination and diffusion subsystem to identification, it is surprising that the dissemination and diffusion subsystem was one of the least related of the four subsystems based on the HLM analysis. In addition, the HLM analysis indicated that even when scores for project team dissemination and diffusion learning actions were high, team size remained a factor. This could be an indication that large team sizes can diminish the effectiveness of the dissemination and diffusion subsystem.

Environmental interface subsystem. The environmental interface subsystem relates the collective to its environment by securing, filtering, and expelling information and knowledge, both proactively and reactively. This subsystem also enacts the environment. New information is the output of this subsystem, which is used by the other subsystems to create knowledge. This subsystem relates to identification by contributing information that delineates groups and draws distinctions between ingroups and outgroups. The finding that the project team's environmental interface subsystem is related to project team identification contributes support to the basic theory underlying organizational identification, which is that social categorization forms ingroups and outgroups (Pratt, 2001). In this study, the ingroup is the project team to which a member belongs and nonmembers belong to outgroups.

The function of the environmental interface subsystem is to gather information from the environment, some of which will include information about outgroups (other organizations or project teams) and the impressions of others about the ingroup. There

are numerous examples of research examining the influence of the impressions of others about the ingroup and its influence on identification (see Bergami & Bagozzi, 2000; Dukerich, Golden, & Shortell, 2002; Dutton, Dukerich, & Harquail, 1994). The contribution of this study is that not only does it include external information but it also incorporates that external information into a system within which the external information is acted and reflected upon, disseminated and diffused, and made meaningful. The significance of the total project team learning actions relationship to project team identification indicates that it is not only the external information that is allowed into the system but also what is done with it once it enters the system.

As an example, it is possible to theorize that the project team environmental interface subsystem would not have been related to project team identification based on the project team structure and the likelihood that the average project team member is internally focused rather than externally focused because project teams operate independently. Because the results showed a relationship between the environmental interface subsystem and identification, it seems likely that the project teams were effective in disseminating and diffusing external information throughout the project team and making sense of it within the project team.

Memory and meaning subsystem. The memory and meaning subsystem creates, sustains, and stores cultural values and beliefs through interpretive schema, language, and actions (Schwandt, 1997). It is logical then that the memory and meaning subsystem of learning actions would have the strongest relationship to project team identification compared to the other subsystems because it is within the memory and meaning subsystem, and the intrasubjective and intersubjective meanings developed by members

of the collective, that organizationally relevant schemas for identification are developed (Vough, 2011). These schemas contribute to salience of the collective, resolution of uncertainty, self-esteem, and self-verification, which are the tenets of social identity theory.

Schwandt (1997) describes the medium of interchange of the memory and meaning subsystem as sensemaking, which occurs through the interpretive schema associated with cultural beliefs, values, assumptions, and artifacts. Recent literature indicates that identification occurs through sensemaking (Ashforth, Harrison, & Corley, 2008; Vough, 2011); therefore, it might be expected that the memory and meaning subsystem would have a much stronger relationship with identification than the other subsystems. Although the relationship between the project team memory and meaning subsystem and project team identification in this study was the strongest of the four subsystems, the difference between them was not great. One possible explanation for this discrepancy is that sensemaking does not occur in a vacuum and that, in the organizational learning system, the memory and meaning subsystem relies on inputs from the other subsystem for effective functioning.

For example, Vough (2011) found that individuals rely on a variety of explanations for sensemaking about identification with work groups, organizations, and professions. These explanations included personal relationships, knowledge of their work, ideology (values, culture, norms), and the ability to enact their environment. Ashforth, Harrison, and Corley (2008) say that sensemaking and enactment are stimulated by sensegiving, which includes the organizationally relevant answers to questions individuals have about identification. This study further develops this thinking

138

by indicating that organizational learning, as a system of action, includes the organizationally sanctioned, multidimensional inputs that are used as raw materials for sensemaking about identification. As a system, one function cannot thrive by itself but instead relies on the inputs of the other subsystems.

Summary of Theoretical Implications

One primary contribution of this study to theory is the finding that identification is directly related to organizational and contextual factors based on the use of a multilevel conceptual framework. This finding extends understanding of organizational identification beyond the singular, individual level variables typically used. This perspective addresses needs in both organizational learning (Crossan, Maurer, & White, 2011) and organizational identification (Ashforth, Harrison, & Corley, 2008; Ashmore, Deux, & McLaughlin-Volpe, 2004) theories to understand cross-level, multidimensional aspects that have not been addressed in the literature but promise to contribute to understanding and development of theory.

A second primary contribution this study makes is support for a view of organizational learning that is grounded in social action theory. This study found that each subsystem of the organizational learning system predicted identification, indicating that previous literature relating individual contextual factors to identification may be accurate but only offer partial explanations. Further theorizing based on the comprehensive model of organizational learning used in this study, to include moderating variables, may prove meaningful in understanding identification.

A third primary contribution of this study to theory is that the use of an organizational learning model grounded in social action theory is an integrated and

comprehensive way to view relationships to organizational identification. The key to this insight is the concept of a merger between the individual and the collective that exists in both the general theory of action and social identity theory. In the general theory of action, this merger is between the individual, based on biographical and historical background, and the systemic, institutionalized meanings, values and beliefs of the collective (Bluth, 1982). In social identity theory, this merger is the shift from perceptions of the self as a unique person to that of an interchangeable exemplar of the depersonalized prototype that occurs through the development of shared meanings in social interaction (Hogg & Terry, 2001). This insight adds to understanding of the complex ways in which identification is formed and broadens the applicability of the OLSM, which is based on the general theory of action.

Another way to conceptualize this merger is to view it as a learning process at the individual level. If organizational identity is embedded in structures, cultures, practices, and behaviors (Corley & Gioia, 2003), then identification occurs as individuals align their own identities with that of the organization as they learn about the organization's identity through enactment and participation. This view of identification is similar to the situated learning theory perspective of identification (Handley, Clark, Fincham, & Sturdy, 2007) and potentially extends multilevel models of organizational learning (Crossan, Maurer, & White, 2011). This is a potential topic for future research.

Empirical Implications

According to Ashmore, Deux, and McLaughlin-Volpe (2004), the influence of contextual elements such as social structures, patterns of interaction, and shared beliefs on identification should be examined using hierarchical linear models. Likewise,

Crossan, Maurer, and White (2011) call for more research on organizational learning using multilevel approaches. This study contributes to the empirical research on organizational identification and organizational learning by employing a multilevel model to examine the relationship between the constructs. The advantage of multilevel models, besides the advantage related to statistical analysis, is that they more directly examine the complex, recursive relationship between individuals and collectives.

Research on organizational identification, which is grounded in social identity theory, has primarily focused on individual level antecedents, which is to be expected given the social psychological foundation of social identity theory and its emphasis on cognition. Whetten (2007) and Tyler (2001) pointed out the limitations of this approach as it relates to organizational research. The limitations include the fact that membership is not assigned but selected, membership in organizations is ambiguous, and organizations act on their members. Social identity theory research has its roots in laboratory experiments using minimal groups with no individual stakes in the groupings. This study contributes to research on identification and directly addresses some of these concerns by introducing a model for an antecedent that integrates existing social theories of organizations into its fabric (Schwandt & Marquardt, 2000). In this way, organizational identification is taken out of the laboratory and into the organization and the unique attributes of organizations as social groups are taken into account.

Another aspect of this study contributes to research in both organizational learning and organizational identification. The use of project teams as the target of identification in this study is significant in several ways. Identification with more proximal targets has been shown to be stronger (Solansky, 2010). Additionally, in

141

multilevel models proximal linkages between levels result in more meaningful results than more distal linkages because the number of confounding variables and moderators is potentially increased in distal linkages (Kozlowski & Klein, 2000). In this study, the proximal linkage between individuals and project teams was investigated rather than individuals in departments, organizations, or other higher-level collectives. As a result, the findings are more meaningful than studies that use those more distal relationships.

This study also contributes to the ongoing empirical research on the four subsystems of the OLSM (Schwandt, 1997). According to Casey (2005), by examining relevant variables in organizational research in relation to the OLSM, our understanding of the four subsystems increases. This study adds to the increasing amount of quantitative data gathered from studies using the OLSM and the OAS (Johnson, 2000). Numerous quantitative studies have used the OLSM to examine organizational phenomena. Some have examined the variables that influence or relate to organizational learning such as project manager norms, behaviors, and tools (Hollandworth-George, 2004), executive succession planning (Hunte-Cox, 2004), leadership (Vincent, 2006), culture (Ba, 2004), and affective commitment (Krishna, 2008). These studies primarily used correlation and regression techniques to understand relationships at the collective level of analysis. This study is the first to use multilevel modeling techniques to begin to understand the cross-level effects inherent in the model. This is also a significant contribution to organizational learning research in general, since very few studies have used this technique in organizational learning research (Crossan, Maurer, & White, 2011).

This study also contributes to the research on project teams. As the use of project

142

teams in organizations continues to grow (Blindenbach-Driesen & Van Den Ende, 2010; Ellemers, De Gilder, & Haslam, 2004), research is needed to understand whether and how phenomena of interest previously examined at the organizational level occur at the project team level. Understanding how project team learning actions are related to project team identification opens the door to further theorizing about the relationship between the organizational level and the subunit level. How do organizational level factors moderate the relationship between project team learning and project team identification? For example, there are risks associated with strong project team identification that results in project team attributes that are counter to those of the organization at large, for example cross-team innovation. Perhaps distributed forms of organizational learning practices that are integrated at the organizational level but implemented at the project team level could mitigate these risks.

Practical Implications

Research has established that developing, strengthening, and maintaining perceptions of oneness or belongingness in members results in positive outcomes such as improved cooperation and extra effort by employees (Corley & Gioia, 2003; Edwards & Peccei, 2007), higher job satisfaction, increased job involvement, stronger motivation (Van Knippenberg & Van Schie, 2000), and lower turnover (Cooper & Thatcher, 2010). In this world of tenuous organizational membership and fast-paced change, the results of this study indicate that project-based organizations may be able to elicit more of these positive outcomes of identification for both employees and project teams if they can develop project team learning capacity. Employees in project teams with effective systems of learning may identify more strongly with their project teams, resulting in

143

increased positive outcomes compared to organizations in which project team learning is less effective. This study also indicates that all four subsystems of the organizational learning system are important in terms of their relationship with identification and that managers need to attend to all aspects of the system, not just a select few.

Additionally, this study could serve as a guide for helping organizations to improve the effectiveness of efforts to realize the positive outcomes of identification. As Schwandt and Marquardt (2000) say, the OLSM provides a "foundation for valuing information about your organization's actions" (p. 229). By examining the organizational learning actions and the patterns of interchange media, organizational developers could identify ways to enhance the organizational learning system, which could lead to increased identification. An important element of this process would be the recognition that organizational learning is a system of actions and that focusing on one aspect over others will not lead to the intended outcomes. For example, an organizational unit that is experiencing high turnover and low job satisfaction may be suffering from low identification in its members. A manager may decide that increased rewards are needed to keep people in the organization and happy. A more effective approach may be to recognize the complex system of interaction between individuals and the collective and identify ways to develop the learning system across all four subsystems to potentially influence identification, which has been shown to lead to lower turnover and increase job satisfaction (Van Knippenberg & Van Schie, 2000).

Managers also need to proceed with caution when attempting to implement practical applications of the findings of this study as unintentional effects can occur and the positive implications of strong identification can be overstated. As Glynn, Kazanjian,

and Drazin (2010) point out in their study of innovation intentions, too much identification can have negative consequences as well. In their study, project teams with strong member identification suffered from an inability to share information across teams, leading to reduced capacity to innovate across the organization. Based on the positive relationship between learning actions and identification found in this study, an organization that is experiencing over-identification within project teams may be able make adjustments that could mitigate the negative consequences. For example, an organization could focus on developing its organizational learning capability in addition to its project team learning capability, which could potentially mitigate the negative effects of over-identification with the team. The organization could change reporting structures to be matrixed rather than within teams, create superordinate goals above the project level, or include ceremonial occasions that reward cross-team collaboration. These adjustments may increase identification with the organization, and alleviate the negative consequences of over-identification with project teams.

Conclusions

The purpose of this study was to examine the relationship between project team learning and project team identification. Project team learning was measured using the OLSM and included four subsystems: memory and meaning, action and reflection, dissemination and diffusion, and environmental interface (Schwandt, 1997). Project team identification was measured using the Mael and Ashforth (1992) scale. Results from HLM analysis revealed relationships between project team learning and all four learning subsystems with project team identification. These results contribute to the theoretical,

empirical, and practical aspects of both the organizational learning and organizational identification constructs.

This study expands understanding of who people are and why they do what they do in organizations (Ashforth, Harrison, & Corley, 2008). This understanding is valuable because research has shown that higher levels of organizational identification result in positive outcomes for individuals and organizations. The methodology used in this study recognizes the complex, multilevel nature of organizational phenomena. Future research can expand the investigation of the relationship identified in this study through a variety of approaches that were outside the scope of the current research including the inclusion of additional variables and qualitative methods. Organizations can implement a variety of organizational learning interventions to potentially foster identification in members. This study opens the door to further development of the relationship explored in this research.

Based on the extensive research indicating the effect of organizational identification on work behaviors and positive outcomes, it is important to understand the relationship between organizational actions and identification. The trends in organizational settings and environments that make it difficult for individuals to understand who they are in relation to their organizations highlight the importance of identification in organizations. In this study, project team organization was the setting but other settings such as virtual work arrangements, global organizations, and contract work are also important to understand. Each of these settings has unique characteristics that affect the organizational actions taken and the relationship between organizations and their members. This study indicates that by recognizing and understanding the cross-

146

level relationship between organizational learning actions and organizational

identification we may be better able to manage in ways that increase identification in

members.

The findings of this study indicate the need for more cross-level,

multidimensional research that contributes to the understanding of the complex

relationship between people and organizations. Some of this research should be based on

models grounded in comprehensive, integrated theories, such as the general theory of

action, because with time new techniques are developed that more accurately explore the

implications of such theories. This approach to theory and research can add insight in

ways that singular, isolated variables cannot.

Limitations

There were several limitations associated with this study. The purpose of this

study was to understand relationships between the variables. This was not an

experimental study and there was no control over the independent variables so causal

inferences were not possible. The results described in Chapter 4 are explanatory in

nature and are not intended to imply causality. This study did not use random sampling

but was limited to a convenience sample with all members of the selected project teams

invited to participate so the findings are not generalizable beyond the scope of this study.

The implications of the findings described in this chapter are intended to encourage

further research that extends beyond the bounds of this study. This was a cross-sectional

study so temporal aspects were not considered. The data collected for this study was

limited to self-reported data, which introduces the possibility of social desirability bias

and dependence on the accuracy and truthfulness of the responses. In addition,

participation in this study was voluntary. Participant self-selection could have biased the results. The possibility exists that other potentially confounding variables not included in this study could influence project team identification. Control variables were used to isolate these effects; however, these control variables may not fully account for other influences on identification. Finally, the type of statistical analysis used in this study limited the extent of the results that could be obtained. Correlations and HLM are only two types of statistical analyses that could have been used in this study. Other analyses would have yielded other types of results.

Recommendations for Future Study

This study established the relationship between project team learning actions and project team identification. Future research should examine this relationship in the context of other variables that expand understanding of the relationship between the constructs. For example, studies could examine the mediating and moderating relationships between organizational learning, organizational identification, and other variables that have been linked to organizational identification in the literature. This study was delimited to only five HLM models that examined the five separate measures of the instrument. The HLM analysis could have been approached other ways, for example, using a step up procedure with the four project team learning subsystem variables. In addition, other HLM models could be built to enrich and expand upon this study and the relationships among variables. These types of studies could also include other measures of identification, perhaps based on organizational roles as proposed by identity theory. Studies involving the dissemination and diffusion subsystem, and its structuration interchange media, and identity theory-based measures of identification

could prove particularly fruitful. Similar studies could focus on organizations rather than project teams.

Researchers could also design studies that examine the relationship between organizational learning and organizational identification in organizational settings such as virtual teams, globalized work groups, teams of contracted labor, and other new forms of organizing in which the relationship between organizations and members are difficult to define. These studies could also examine the role of leadership in the relationship between organizational learning and organizational identification. New types of organizing have unique leadership characteristics. Reicher, Haslam, and Hopkins (2005) describe leaders as actively creating and defining identities in their followers. Part of this process includes the ways in which leaders develop structures, vision, and a common sense of purpose that support the creation of meaning in followers that influences identity. This process also involves the agency of followers not as passive recipients, but as active participants in identity construction.

Another avenue of future research could include the four types of identification described in Kreiner and Ashforth's (2004) expanded model of organizational identification: identification, disidentification, ambivalent identification, and neutral identification. Researchers, using quantitative or qualitative methods, could investigate the relationship between learning actions and the different forms of identification. Qualitative methods could be effective in these types of studies as researchers try to understand how learning actions affect identification.

Schwandt (1997) says that qualitative studies of organizational learning are needed for deeper and more robust understanding of interchange media. This study was

delimited by its view of identification as an outcome. Qualitative studies could examine the identification as a process to develop an understanding of how identification occurs through organizational learning. Qualitative research could be also be conducted to probe the relationship between organizational identity, organizational learning, and organizational identification. Scholars have indicated a relationship between organizational identity and organizational learning based on cultural processes and meaning making (Corley & Gioia, 2003) and between organizational identity and organizational identification through sensebreaking and sensemaking (Ashforth, Harrison, & Corley, 2008). Now this study indicates a relationship between organizational learning and organizational identification. Based on these connections in the literature, researchers could examine the role that organizational learning, especially the memory and meaning subsystem, plays in the relationship between organizational identity and organizational identification. Phenomenological and case studies would be appropriate methods to investigate these relationships further. Longitudinal studies would also enhance understanding of the relationships between these constructs as all are theorized to change over time (Corley & Gioia, 2003; Ashforth, Rogers, & Corley, 2011).

Finally, case study research could be used to investigate the negative side of the relationship found in this study. For example, a highly functional organizational learning system could lead to strong identification, but result in negative outcomes such as fanatical loyalty to a subversive organization.

As organizational scholars have suggested, current trends in work such as virtual work, technology, flexible work schedules, and nontraditional structures make it difficult for members to understand who they are in relation to the organization (Ashforth,

150

Harrison, & Corley, 2008; Oldham & Hackman, 2010). For this reason, it is more

important than ever to understand the relationship between the organization and its

members. This study contributes to the theoretical, empirical, and practical

understanding of one aspect of this relationship.

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161

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Appendix A: Initial Email

All,

    As you know, the company has been conducting surveys recently requesting your participation and feedback regarding our activities here at XYZ Corporation.

    One of our own employees, and a doctoral candidate at The George Washington University, James Doiron, is conducting research that is related to those surveys and relevant to our increased understanding of the company and efforts to improve. We believe this research can provide some helpful information to the company regarding job satisfaction and retention, while also helping Jim complete his research.

    Your participation is voluntary and all the information provided by you will remain anonymous and confidential. I would greatly appreciate it if you could spare approximately ten minutes of your time to complete this online survey.

    Please contact Jim directly if you have any questions at jdoiron@gwmail.gwu.edu or 703-XXX-XXXX. You should receive an email from Jim within the next few days requesting your participation. Thank you for your support.

Sincerely,

Sr. Vice President, Human Resources
XYZ Corporation

Appendix B: First Request

Dear [FirstName] [LastName]:

A few days ago, you received an email from Tom Bailey about my research study. You have been randomly selected to participate in a survey being conducted for my doctoral dissertation research at The George Washington University. The focus of this survey is the project team that you support with the first part of the charge number and project name of: [CustomData]. Please answer all questions as they relate to this project team. Click the following link to take the survey.

{link}

The purpose of this study is to understand the influence of project team learning actions on project team identification. Project team learning actions include those activities that result in knowledge that enables the group to adapt to changing conditions. Project team identification is a sense of oneness or belongingness to the project team. The study results will be shared with corporate management for the purposes of understanding and improving the company. I would greatly appreciate it if you could spare approximately ten minutes of your time to complete this online survey.

Your participation is voluntary and all the information provided by you will remain anonymous. This survey does not ask any identifying information and I have no means to identify the source of a response. Further, the information that is supplied will not be used for any purpose other than this research study.

This survey is not only extremely important to the successful completion of my dissertation, but it should also provide useful information to Tom and the company that will help in increasing job satisfaction and retention of high quality employees.

Please remember that it is important to complete the entire survey and to answer all the questions to the best of your ability – there are no right or wrong answers. Please click the link below to complete the survey. Thank you for your support.

Sincerely,

James Doiron
Doctoral Candidate
The George Washington University
Ashburn, Virginia
jdoiron@gwmail.gwu.edu

Appendix C: Implied Consent

You are invited to participate in a research study under the direction of Dr. Andrea Casey of the Graduate School of Education and Human Development (GSEHD), The George Washington University. The research will be conducted by James Doiron, a doctoral student. Taking part in this research is voluntary.

The purpose of this study is to understand the influence of project team learning actions on project team identification. Project team learning actions include those activities that result in knowledge that enables the group to adapt. Project team identification is a sense of oneness with or belongingness to the project team. In addition, the study results will be shared with corporate management for the purposes of understanding and improving the company.

If you choose to take part in this study, you will be asked to indicate your perception of various aspects of your project team. The total amount of time to complete the survey is about 10 minutes. You may refuse to answer any of the questions and you may stop your participation in this study at any time. Your employment status will not be affected in any way by your decision to participate or not.

Participating in this study poses no risks that are not ordinarily encountered in daily life. The survey is anonymous - we will not collect your name or any other identifying information. The data will be retrieved by the researcher and overseen by a professor in the GSEHD. Findings will be shared without attribution. If results of this research study are reported in journals or at scientific meetings, the people who participated in this study will not be named or identified.

The benefit to your participation is that this is a reflective opportunity for you as well as an opportunity to provide feedback to your company. You may also indirectly benefit as a result of possible improvements within the company that may be suggested by the results.

The Office of Human Research of The George Washington University, at telephone number (202)994-2715, can provide further information about your rights as a research participant. Further information regarding this study may be obtained by contacting James Doiron at (703)XXX-XXXX or Dr. Andrea Casey at (703)726-3763.

Your willingness to participate in this research study is implied by clicking "Next" below.

Next

This survey asks questions about your project team. Although you may support more than
one project team, please answer the questions as they relate to the project team indicated
in the email invitation. This survey has 28 questions divided into three sections and
should take approximately 10 minutes to complete. Answer questions by mouse clicking
in the circle that corresponds with your answer. You can only select one answer for each
question. When you are finished, please click on the 'Done' button at the end of the
survey. Your answers are anonymous. Thank you for your participation.

Section 1

Instructions: Please answer the following items as they apply to the project team
indicated in your email invitation. Please answer all the questions.

1. Does your project team see mistakes as learning opportunities?

☐ To a very little extent

☐ To a little extent

☐ To some extent

☐ To a great extent

☐ To a very great extent

**2. Are there systems in place to share new operational processes and procedures
throughout the project team?**

☐ To a very little extent

☐ To a little extent

☐ To some extent

☐ To a great extent

☐ To a very great extent

Next

175

3. Does your project team predict the changes occurring in the external

environment?

- ☐ To a very little extent
- ☐ To a little extent
- ☐ To some extent
- ☐ To a great extent
- ☐ To a very great extent

4. Does your project team continuously track how your competitors improve their products, services, and operations?

- ☐ To a very little extent
- ☐ To a little extent
- ☐ To some extent
- ☐ To a great extent
- ☐ To a very great extent

5. Does your project team believe that continuous change is necessary?

- ☐ To a very little extent
- ☐ To a little extent
- ☐ To some extent
- ☐ To a great extent
- ☐ To a very great extent

6. Do members of the project team effectively use project team structures (e.g., chain of command, personal networks) when sharing ideas and innovations?

- ☐ To a very little extent
- ☐ To a little extent
- ☐ To some extent
- ☐ To a great extent
- ☐ To a very great extent

Next

7. Do people on your project team believe that evaluating is critical to reaching the project team's goals?

- ☐ To a very little extent
- ☐ To a little extent
- ☐ To some extent
- ☐ To a great extent
- ☐ To a very great extent

8. Does your project team deliberately reflect upon and evaluate external information?

- ☐ To a very little extent
- ☐ To a little extent
- ☐ To some extent
- ☐ To a great extent
- ☐ To a very great extent

9. Does your project team have a strong culture of shared values, beliefs, and norms that support individual and project team development?

- ☐ To a very little extent
- ☐ To a little extent
- ☐ To some extent
- ☐ To a great extent
- ☐ To a very great extent

10. Does your project team provide opportunities for project team members to develop their knowledge, skills, and capabilities?

- ☐ To a very little extent
- ☐ To a little extent
- ☐ To some extent
- ☐ To a great extent
- ☐ To a very great extent

Next

11. Does your project team have set goals for researching and developing new products and/or services?

☐ To a very little extent

☐ To a little extent

☐ To some extent

☐ To a great extent

☐ To a very great extent

12. Does your project team have clear goals for individual and project team development?

☐ To a very little extent

☐ To a little extent

☐ To some extent

☐ To a great extent

☐ To a very great extent

13. Do your project team's leaders support quick and accurate communication among all the project team members?

☐ To a very little extent

☐ To a little extent

☐ To some extent

☐ To a great extent

☐ To a very great extent

14. Do members of your project team share external information?

☐ To a very little extent

☐ To a little extent

☐ To some extent

☐ To a great extent

☐ To a very great extent

Next

15. Does your project team have established work groups, networks, and other collaborative arrangements to help the project team adapt and change?

◯ To a very little extent

◯ To a little extent

◯ To some extent

◯ To a great extent

◯ To a very great extent

16. Does your project team use ideas and suggestions from its project team members?

◯ To a very little extent

◯ To a little extent

◯ To some extent

◯ To a great extent

◯ To a very great extent

17. Does your project team learn through informal communication?

◯ To a very little extent

◯ To a little extent

◯ To some extent

◯ To a great extent

◯ To a very great extent

Next

Section 2

Instructions: Please answer the following items as they apply to the project team indicated in your email invitation. Please answer all the questions.

18. When someone praises this project team, it feels like a personal compliment.
☐ Strongly disagree
☐ Somewhat disagree
☐ Neither agree nor disagree
☐ Somewhat agree
☐ Strongly agree

19. I am very interested in what others think about my project team.
☐ Strongly disagree
☐ Somewhat disagree
☐ Neither agree nor disagree
☐ Somewhat agree
☐ Strongly agree

20. If a story in the media criticized this project team, I would feel embarrassed.
☐ Strongly disagree
☐ Somewhat disagree
☐ Neither agree nor disagree
☐ Somewhat agree
☐ Strongly agree

Next

21. This project team's successes are my successes.

☐ Strongly disagree

☐ Somewhat disagree

☐ Neither agree nor disagree

☐ Somewhat agree

☐ Strongly agree

22. When I talk about this project team, I usually say 'we' rather than 'they'.

☐ Strongly disagree

☐ Somewhat disagree

☐ Neither agree nor disagree

☐ Somewhat agree

☐ Strongly agree

23. When someone criticizes your project team, it feels like a personal insult.

☐ Strongly disagree

☐ Somewhat disagree

☐ Neither agree nor disagree

☐ Somewhat agree

☐ Strongly agree

Next

Section 3

Instructions: Please answer all of the following items as they apply to you and the

project team indicated in your email invitation.

24. What is your gender?

☐ Male

☐ Female

25. What is your age?

☐ Under 25

☐ 26-35

☐ 36-45

☐ 46-55

☐ Over 55

26. How long have you been a member of your current project team?

☐ Less than 6 months

☐ Less than 1 year

☐ 1-2 years

☐ 2-3 years

☐ More than 3 years

27. Which of the following best describes your current position with the company?

☐ Non-management

☐ Supervisor

☐ Professional

☐ Middle Management

☐ Senior Management (VP or above)

Next

28. Which of the following best describes your primary means of interaction with other project team members?

☐ Face-to-Face

☐ E-mail

☐ Telephone

☐ I have very little interaction with other team members

[Prev] [Done]

Appendix E: Second Request

Dear [FirstName] [LastName]:

    A few days ago, I emailed you to request your participation in a survey in support of

my doctoral dissertation research.

    I realize that you may not have had time to complete the survey yet. Please know that

your participation is extremely important both to my research and to the company. I

would greatly appreciate it if you could take a few moments to complete the survey at

your earliest possible convenience. Remember, this survey is completely anonymous.

    Thank you in advance for your participation. Below is a link that will take you

directly to the survey website and please remember to answer the questions in relation to

the [CustomData] project.

<div align="center">{link}</div>

Sincerely,

James Doiron
Doctoral Candidate
The George Washington University
Ashburn, Virginia
jdoiron@gwmail.gwu.edu

Appendix F: Third Request

Dear [FirstName] [LastName]:

I am writing again to urge you to participate in my survey. Some additional participants have completed the survey since my last email, but there are still a number of surveys to be done. Remember, this survey is completely anonymous.

Please understand that without a sufficient number of responses, the results may not provide enough information to provide any meaningful understanding. It is not too late. I would greatly appreciate it if you could take a few moments to complete the survey at your earliest possible convenience.

Thank you in advance. Below is a link that will take you directly to the survey and please remember to answer the questions in relation to the [CustomData] project.

{link}

Sincerely,

James Doiron
Doctoral Candidate
The George Washington University
Ashburn, Virginia
jdoiron@gwmail.gwu.edu

Appendix G: Final Request

Dear [FirstName] [LastName]:

This is my final attempt to urge your participation in my research study. If you have not had the time to complete the survey yet please take the time to do it now. I need your help to complete my doctoral research and, as Tom has mentioned in the past, your feedback is extremely important if the company is going to continue to improve. Remember, this survey is completely anonymous.

Thank you in advance for your participation. Below is a link that will take you directly to the survey and please remember to answer all questions as they relate to the [CustomData] project team.

{link}

Sincerely,

James Doiron
Doctoral Candidate
The George Washington University
Ashburn, Virginia
jdoiron@gwmail.gwu.edu