

THE PHYSIOLOGY OF COLLABORATION, AN INVESTIGATION OF
LIBRARY-MUSEUM-UNIVERSITY PARTNERSHIPS

Miguel Angel Morales Arroyo, B.S., M.S.

Dissertation Prepared for the Degree of
DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

August 2003

APPROVED:

Samantha K. Hastings, Major Professor
Lawrence R. Wheelless, Committee Member
Florence M. Mason, Committee Member
Brian C. O'Connor, Committee Member and
Associate Director of the
Interdisciplinary Information Science
Doctoral Program
Philip M. Turner, Dean of the School of
Library and Information Sciences
C. Neal Tate, Dean of the Robert B. Toulouse
School of Graduate Studies

Morales Arroyo, Miguel Angel, The physiology of collaboration: An investigation of library-museum-university partnerships. Doctor of Philosophy (Information Science), August 2003, 219 pp., 21 tables, 15 illustrations, references, 114 titles.

Collaboration appears to be a magical solution for many problems when there is scarcity of resources, lack of knowledge or skills, and/or environmental threats. However, there is little knowledge about the nature of collaboration.

A holistic conceptual framework was developed for the collaborative process, and the conceptualization process used systems thinking approach. The author has selectively chosen conceptualizations and/or research by a limited subset of scholars whose ideas appeared to be the most relevant and useful to explore the type of collaboration studied here. In other words, the selection of the literature was based on an eclectic selection.

Multiple cases were used in this research to understand the factors that are components of collaborative effort among non-profit organizations and the relationships among those factors. This study also investigated the stages of collaborative process. Data were collected from 54 participants who were partners in collaborate projects funded by the Institute of Museum and Library Services (IMLS). Among these 54 participants, 50 answered the online questionnaire and 38 received the telephone interviews.

The data collected was analyzed using cluster analysis, multidimensional scaling, internal consistency reliability, and descriptive statistics.

The component factors of collaboration were grouped by the following seven concepts: trustworthiness, competence, dependency, misunderstanding and/or conflict,

complexity, commitment and mechanism of coordination. This study showed twelve relationships among these factors. For instance, different points of view and partners' capacity to maintain inter-organizational relationships were found to be opposite concepts. In addition, the findings in this study indicate that 84% of participants reported the presence of the five pre-defined stages: execution, networking, definition, relationship, and common evaluation.

Copyright 2003

by

Miguel Angel Morales Arroyo

ACKNOWLEDGMENTS

I wish to thank my dissertation committee, Dr. Samantha Hastings, Dr. Florence Mason, Dr. Brian O'Connor, and Dr. Lawrence Wheelless, for their guidance and encouragement.

The people participating in collaborative projects funded by the Institute for Museum and Library Services (IMLS) made this research possible through their participation in this study and the pilot study, thank you.

I am truly thankful to Dr. Gabriel Sanchez Guerrero, Dr. Jaime Jimenez Guzman, and Ms. Lucila Lezama Ledezma, who have guided and encouraged me in my earlier education experiences. The knowledge and recommendations from Dr. Raymond Scupin, Dr. John P. Van Gigch, and Dr. Peter Dunn-Rankin have opened the door to a range of alternatives in this path. Thank you.

It is also my privilege to thank all my teachers, colleagues, and friends at University of North Texas, Don Cleveland, Ana Cleveland, Yvonne Chandler, Herman Totten, Terry Holcomb, Marsha Merritt, Donna Kiehnhoff-Obenda, Alan Livingston, Josephine Reyna, Abebe Rorissa, Daniel Alemneh, Johanna Glenn, Patti Dale, Vicki Taylor, LeAnne Coffey, and Morgan O'Donnell, for their wisdom and friendship that have enriched my education and given me strength in this journey of intellectual pursuit.

I have to thank my mother, Crecencia Arroyo Osorno, who inspired and nurtured me, and my wife, Yun-Ke Chang, who always stands by me.

I dedicate this dissertation to my late grandmother, Teresa Osorno Guzman.

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS.....	iii
LIST OF TABLES.....	viii
LIST OF ILLUSTRATIONS.....	x
Chapter	
1. INTRODUCTION.....	1
Statement of the Problem	
Background of the Study	
Research Questions	
Purpose of the Study	
Significance of the Study	
Summary	
2. LITERATURE REVIEW.....	11
Perspectives of Collaboration	
Collaboration among Egoists	
Collaboration among Strangers	
Collaboration as an Exchange of Resources, Skills, Knowledge, and Services	
Collaboration from Power Perspective	
Collaboration as an Informal System of Coordination	
Collaboration as a Creative Solution	
Collaboration as a Competitive Advantage	
Collaboration between Nonprofit Organizations (NPO's) and the Governmental Sector	
Amalgamation of Collaborative Perspectives	
Determinants and Consequences of Collaboration	
Determinants of Collaboration	
Positive Expectations	
Factors that Produce Collaboration	
Factors that Benefit Collaboration	
Factors that Harm Collaboration	
Consequences of Collaboration	
Benefits of Collaboration	
Negative Aspects of Collaboration	
Variables and Factors that may Affect Collaboration	
Trustworthiness	
Commitment	

<ul style="list-style-type: none"> Competence Uncertainty Risk Interdependence Coordination Conflict Attribution Perspective Equity Perspective Field Perspective Interactional Perspective Phase Perspective Psychological Perspective Social Exchange Perspective Classic System Approach Transformational Perspective Levels of Collaboration <ul style="list-style-type: none"> Levels of Collaboration in Inter-organizational Relationships Exchange of Resources and/or Services Cooperative Level Collaborative Level Collaborative Process Summary 	68
3. RESEARCH DESIGN AND METHODOLOGY	68
<ul style="list-style-type: none"> Rationale Assumptions Limitations Research Questions Operationalization of Variables Pilot Study Population Sampling and Sample Characteristics Instrument Method Data Collection Procedure Data Analysis Procedure Cluster Analysis MDS <ul style="list-style-type: none"> Unidimensional Map Interviews Analysis Summary 	
4. RESULTS AND DISCUSSION	88
<ul style="list-style-type: none"> Stages in The Collaborative Process 	

Cluster Analysis with all the Variables	
Cluster Analysis with a Reduced Set of Variables	
Multidimensional Scaling Analysis	
Unidimensional Map	
Summary	
5. DISCUSSIONS AND RECOMMENDATIONS.....	113
Answers to the Questions of the Study	
Question One	
Question Two	
Question Three	
Exhibit Projects	
Program Projects	
Digitization Projects	
Speculations	
Successful Projects	
Levels of Collaboration	
Power Asymmetry	
Sequence of Stages	
Implications	
Implications for the Profession	
Implication for Potential Participants	
Implications for Funders	
Some Reflections	
Future Studies	
Summary	
APPENDIX A.....	144
APPENDIX B.....	154
APPENDIX C	157
APPENDIX D	159
APPENDIX E.....	162
APPENDIX F.....	173
APPENDIX G	176
APPENDIX H	191
APPENDIX I.....	194

APPENDIX J	197
APPENDIX K.....	205
REFERENCE LIST.....	209

LIST OF TABLES

Table	Page
1. Perspectives of Collaboration	30
2. Levels of Collaboration	56
3. Variables and Factors	73
4. Participants Roles in Their Projects	79
5. Participants and the Status of Their Projects	80
6. Concepts in the Cluster Analysis 1	94
7. Alpha Values Of Variables in Cluster Analysis 1.....	97
8. Frequencies of the Four Mechanism of Coordination	98
9. Concepts in Cluster Analysis 2	101
10. Alpha Values Of Variables in Cluster Analysis 2.....	103
11. Values of Stress for Number of Dimensions Analyzed.....	104
12. Relationships Between Variables.....	109
13. Unidimensional Map for the Significance of Factors that Affect the Collaborative Project.....	111
14. Unidimensional Map that shows the Frequency in which the Mechanism of Coordination were used.....	111
15. Descriptive Statistics.....	158
16. Sequence of Clustering for Dendogram in Figure 7	160
17. Sequence of Clustering for Dendogram in Figure 8.....	161
18. Dimension for MDS.....	174
19. Nonparametric Correlations – Spearman’s rho N=50	177
19a. Nonparametric Correlations – Spearman’s rho N=50 compiled	189

20. Dendogram 1	195
21. Dendogram 2	196

LIST OF ILLUSTRATIONS

Figure	Page
1. Title Decision Tree	16
2. Power Perspective	22
3. Fish-Bone Diagram	38
4. Collaborative Process	64
5. Operationalization of Variables	75
6. Number of Stages Selected by Participants.....	89
7. Order of Stages by Frequency	90
8. Cluster Analysis 1	93
9. Mechanism of Coordination	98
10. Cluster Analysis 2	100
11. Difficulty to Obtain Information vs. Integration.....	105
12. MDS: Dim 1 and Dim 2.....	107
13. MDS: Dim 1 and Dim 3.....	108
14. Generic Sequence of Stages in a Collaborative Project.....	137
15. Scatterplot of Linear Fig Euclidean Distance Model	175

CHAPTER 1

INTRODUCTION

One of the major challenges facing non-profit organizations is their need to obtain resources to achieve their goals and meet the increased demands of their users. Technological changes and economic factors are forcing museums and libraries to collaborate in order to insure access to our rich cultural heritage.

Lifelong learning needs in our societies arise from the impact of new technologies, forcing changes in the marketplace, industry and affecting the labor market. Telecommunications and computers allow for the integration of technologies, provide access to information and knowledge, and may help to combine different sources of information. Profit organizations have a great amount of opportunities to exploit the new information technologies, but solving the needs for lifelong learning is not one of their goals. Changes in technology, industry and market have been generating challenges and opportunities for museums and libraries. Now, these institutions that have long traditions of service in their communities have the opportunity to expand their presence beyond the traditional environment, using the technology available and creating enhanced learning environments. Sheppard (2000) states, "Museums and libraries are at the heart of such a bold vision for lifelong learning" (p. 6).

Museums and libraries often have different objectives and don't share a common history. A museum is a nonprofit organization committed to collect, protect, preserve, exhibit, study, and provide an interpretation of objects, usually unique in their genre in order to satisfy the needs of its users (Ullberg & Ullberg, 1981). The ideas that art museum administrators had about museums' goals have changed dramatically in the

last one hundred years. At the beginning of the previous century an art museum was a very selective place. Advertising, to attract visitors that did not know how to appreciate art was an infrequent activity among museums. These types of practices have changed over time, and the perception about the *non-initiate* visitor has changed totally since the mid-seventies. Art museum administrators have changed their perception from a centralistic point of view to one that is more open. In the past, they declared that they knew the correct way to appreciate art. Now, they recognize the needs and wishes of their users and incorporate these needs into their programming (Berry & Mayer, 1989).

For libraries, the central purpose is to provide free access to information and knowledge for the benefit of its patrons' intellectual development and recreational reading. A library collects, selects, stores, provides, administrates and controls the information owned in order to serve its community. In addition, it creates descriptions of its materials and has been adapting technology to improve services. Technology has affected libraries throughout the last one hundred years in different ways, which can be identified mainly as: paper, record automation, and digital representations (Buckland, 1992).

Both libraries and museums are experiencing a critical transition derived from several external factors, but are they really prepared to face a series of transformations that the digitalization of their collections are demanding? Many of these institutions see their digital files as substitutes, not as assets. Also, they are not prepared to maintain and manage these digital assets (CLIR, 2000). If these institutions want to take advantage of the technology available, they require the resources, skills and knowledge needed to achieve this objective.

Equally important, there are aspects related to the high cost of the development of digital infrastructure. Even though the funds for digitalization are relatively easy to get, at least in the United States, funds for the maintenance of infrastructure and files and the migration to new technologies are difficult to obtain. Additionally, managers and staff do not have a clear understanding of the value of the digital files in the long term. Museums and library administrators do not have a complete picture of the problems they are facing and their personnel are apprehensive to change (CLIR, 2000). Adapting to the technological change, providing accessibility to their resources, creating awareness of their roles in a lifelong learning process, providing access to the technology and teaching the basic skills needed to access information and knowledge are some of the challenges that museums and libraries face (Sheppard, 2000).

In the adoption of the Internet as a mechanism for propagation of information, knowledge, and culture, some factors negatively affect museums and libraries. For example, the lack of specialists that have both knowledge about digitalization and the collections, lack of personnel to manage the digitalization projects and general lack of funding for increasing staff resources are major problems. Also, the technological rate of change forces continual personnel training and the necessity to obtain economic resources. In order to carry out a transformation, it is useful to recognize the necessity of identifying the new role of these institutions and the pressures that they are exposed to as they increase their presence on the Internet. The advent of the Internet has opened the possibility for many to have access to information, knowledge, and art works from reliable, qualified, and authoritative sources (CLIR, 2000).

This trend cannot be ignored and the institutions have an obligation to provide

these types of services. There are few alternatives for most museums and some of the libraries. The electronic document and the digital representation of objects will be more frequently used in the future. Although museums and libraries are different in their respective cultural spheres because of their objectives and missions, with the Internet some users may not notice the difference because the content of their web sites look alike and serve similar functions to connect people to cultural resources (CLIR, 2000).

An alternative for reducing the negative effects of these problems is to collaborate with other organizations that have the technical capacity in digitalization. Since federal agencies and some private organizations are providing funds for digitalization projects only when partnerships and collaboration occur, universities have begun to make such arrangements.

Collaboration between museums and libraries helps to create flexible learning systems, to assemble more dynamic learning frameworks, and to build infrastructures that bring together content and systems that supply knowledge. The central idea around collaboration between museums and libraries is accessibility to cultural and educational resources and the integration of those resources (Sheppard, 2000).

Collaboration has generated questions that have not been answered satisfactorily. For example, how can institutions collaborate more efficiently? How does collaboration combine stakeholders' interest, priorities and goals? This work focused on some questions linked to the nature of collaboration, utilized different perspectives of collaboration and theories related to collaboration plus system analysis, and the methodology included case study and content analysis.

Statement of the Problem

Collaboration appears to be a magical solution for many problems when there is scarcity of resources, lack of knowledge or skills, environmental threats, opportunities, and/or potential partners that need others to achieve their goals. However, how much do we know about collaboration - its benefits, costs, risks, and constraints? How does collaboration combine parties' interests, priorities, and goals? What are the relevant components and relationships in these kinds of projects? What are the main problems? What are the conditions that are optimal to start, foster, and produce collaboration? What might be the criteria for selecting a partner? These questions and others are not easy to answer.

Although, everybody experiences this phenomenon on multiple occasions during their lifetime, and scholars from different academic background have been working on this problem, our understanding of this problem is limited. It is difficult to find in the literature: a) generic collaborative models that describe the stages in the collaborative process beyond its theoretical background, b) holistic perspectives of the problem, and c) theories that identify factors that affect the collaborative effort and explain possible relationship among those factors. This problem that requires multidisciplinary approaches to be studied is dynamic, and complex. Consequently, the justifications and motivations of this work are to gain an understanding of the nature of collaboration.

Background of the Study

In the literature, there are more studies about collaboration in business than about collaboration in non-profit organizations. Also, there is very little research related to the nature of collaboration, which is accepted by a majority of authors. For example,

Schrage (1990) affirms categorically "collaboration is one of the most poorly understood and least appreciated human behaviors; it also happens to be one the most important" (p.34). Mintzberg, Jorgesen, Dougherty & Westley (1996) add that scholars and managers need to work hard to cross their respective limits and study the fragmented field of collaboration. Additionally, Ring & Ven (1994) established that scholars pay little consideration to the investigation of the development of inter-organizational relationships. Most of the investigation has been concentrated on the precedent circumstances or the structural characteristics of inter-organizational relationships and the way they are controlled and managed, but not the process.

Referring to federations, D'Aunno & Zuckerman (1987) remark that, "there has been little or no attention given to the development over the time or life cycle of federations", which are "three or more organizations that intentionally pool resources to achieve stated objectives." "No adequate framework exists to guide researchers and managers who are concerned with the behavior of federations after they are formed" (p.535). Long-term relationships are replacing short-term interactions, which may create conditions to benefit competitive advantages (Rackham, Friedman, & Ruff, 1996), and at the same time, the role of collaborative efforts is increasing its importance in business competition. However, Doz & Hamel (1998) comment, "it is disappointing to find how few managers pay attention to their fluidity and evolution and how many academics and consultants offer simpleminded analyses and prescriptions for their management" (p.7). Also, Doz (1996) adds, "studies of strategic alliances as evolutionary processes are scarce" (p.55). Additionally, Doz (1996) states, "Little research has examined how organizations adjust their level, mode, and commitment to cooperation over the time as

a result of learning feedback endogenous to the cooperation process, and how therefore we may need to include process descriptor variables between the initial intents and characteristics of strategic alliances among firms and their actual outcomes” (p.56).

Research Questions

This study examined the collaborative process and the factors that affect that process in museums, libraries, and university partnerships. The factors that were studied were trustworthiness, commitment, competence, interdependence, complexity, integration, coordination and conflict. These factors were derived from an in-depth literature review and are discussed in Chapter 2.

The research questions are:

1. What are the factors that affect the nature of collaboration according to the perception of the partners collaborating in the funded projects?
2. Are there relationships among the factors that may affect collaboration?
3. What are the stages in a collaborative process?

Purpose of the Study

The purpose of this study was to try to understand some of the aspects related to the nature of collaboration for funded collaborative projects among non-profit organizations - specifically museums, libraries, and/or universities, collaborating in funded projects by the Institute of Museums and Library Services (IMLS)¹.

¹ The Institute of Museum and Library Services: Washington, DC. www.imls.gov

The title of this work, the physiology of collaboration, can create some confusion. The Oxford English Dictionary² defines physiology in its first meaning or etymological meaning as: The study and description of natural objects; natural science or natural philosophy; also, a particular system of doctrine of natural science. The second meaning is the science of the normal functions and phenomena of living things. Both meanings are used here. The study and description of a living organism is an analogy between biology and collaboration. The author is trying to understand the nature of collaboration, the basic constitution, or inherent characteristics of collaboration. The analogy with biology was developed by the system movement, and was needed to understand concepts like synergy.

Multiple cases were studied, using a questionnaire and interview script to gather data for this study. The conceptual framework was based on different models and perspectives of collaboration. These differing viewpoints are presented in detail in Chapter 2 of the work. The major perspectives used are listed below.

- Strangers perspective by Brown (1995)
- Social theory of exchange by Blau (1964)
- Informal coordination by Chisholm (1989), and
- Collaborative models by Doz (1996) and Ring & Ven (1994).

Collaboration at the most basic level could be defined as a dynamic, interactive, and interdependent process in which the stakeholders work together, share resources and sometimes a vision in order to obtain their goals.

² Copyright © Oxford University Press 2003

Each of the perspectives of collaboration has their own theoretical roots, limitations, and logic. Not one, by itself, has a holistic and detailed picture of collaboration among organizations. In order to develop the conceptual framework needed for discussion and to collect empirical data, the author used systems analysis techniques. These are described in detail in Chapters 2 and 3. Techniques used include the KJ method, fish-bone diagrams, concept maps, cognitive mapping, interaction matrices, morphological analysis, problem-purpose expansion, objective tree, and the use of solutions for problem identification.

Significance of The Study

The increasing complexity derived from the fast rate of technological change, the process of globalization, the lack of knowledge, resources, and skills to achieve their goals are forcing organizations, groups and individuals to collaborate. Consequently, there is a fundamental need to know more about collaboration, its different levels, as well as the factors and its combinations that affect this phenomenon.

Using systems thinking, collaborative perspectives were analyzed to supply a holistic framework, and possibly to identify some variables and their relationships in order to understand the nature of collaboration. According to Checkland (1981), this type of framework should be considered as a starting point of discussion. The framework is needed because the collaborative perspectives have a narrow scope. For example, perspectives and model about collaboration oriented to business emphasize the study of aspect like how to reduce risk, define control structures, and maximization of revenue.

Summary

Libraries and Museums are two different types of non-profit organizations that look similar in the Internet environment. Both entities are challenged to find the resources and skills to incorporate their assets into the technological mainstream. Collaboration with other organizations in order to overcome their limitations is an attractive alternative. The objective of this study was to study some of the aspects related to the nature of collaboration. In Chapter 2 an investigation and discussion of different theoretical perspectives are presented. Based on the findings, a framework of the collaborative process including viable factors is developed.

CHAPTER 2

LITERATURE REVIEW

In this literature review, eight different perspectives of collaboration are described. Aspects from how egotists and strangers collaborate to how to create new solutions and value their common endeavor were analyzed. Additionally, determinants, consequences, and elements that aid in the understanding of collaboration are expressed. Finally, concepts related to the levels of collaboration as well as those involved in the collaborative process were analyzed.

The Oxford English Dictionary© defines collaboration as: United labour, co-operation, esp. in literary, artistic, or scientific work. This definition is succinct and laconic, does not help to understand the richness of this dynamic process, and does not make any distinction between cooperation and collaboration. Neither does the following definition do any kind of distinction. Cooperation “is a developmental process in which direct interactions take place between two or more interested parties in order to advance a joint goal or to solve a joint problem that is too complicated for any of the parties to achieve or to solve on its own” (York & Zychlinski, 1996, p. 16).

Collaboration is an unstructured or ill-defined problem. Checkland (1981) defines an unstructured problem as one in which the approach of natural science is ineffective. Usually, this type of problems involves human interaction and real situations; the definition of ends and objectives is problematic; and there are not defined procedures to select efficient alternatives to attain ends (Checkland, 1981). Simon (1973) provides some characteristics of ill-defined problems for artificial intelligence systems. Here are only used the characteristics that apply to social interaction - inexistence of criterion for

testing any proposed solution, lack of procedures that allow defining accurately initial state, goals, and intermediary states, lack of predictability of phenomenon behavior, and the inapplicability of laws of nature to these problems (Simon, 1973).

Collaboration among non-profit organizations (NPOs) has not been studied profusely and deeply. In order to define the factors that benefit collaborative efforts in NPOs, Mattessich & Monsey (1992) examined 133 collaboration studies and chose 18 studies that matched their research criteria. They focus on the outputs of the collaborative process identifying what makes a collaborative effort successful, but studying only the outputs does not allow for understanding the dynamics of the collaborative process.

York et al. (1996) established that a few decades ago collaboration between government and nonprofit organizations was considered without any value. In 1995, the Academy of Management Journal published a special issue on cooperation, in which 62% of the submitted articles studied cooperation between organizations, 21% of the submitted articles studied cooperation between individuals, and the rest of the articles (17%) studied cooperation between groups or departments. From that issue, Smith, Carroll, & Ashford (1995) concluded that scholars are reevaluating the research, theories and their knowledge about collaboration in order to address the organizational reality that needs to be confronted.

It is difficult given time and economic restrictions to make a comprehensive literature review on collaboration because many theories and disciplines have studied it from different perspectives (Smith et al., 1995). Scholars have been using different theoretical perspectives to study collaboration. Wood and Gray (1991) summarize the

characteristics of those points of view. The theoretical perspectives that they review are resource dependency theory, corporate social performance theory/institutional economics theory, strategic management theory/social ecology theory, microeconomics theory, institutional theory/negotiated order theory, and political theory (Gray & Wood, 1991; Wood & Gray, 1991). They are also interested in different aspects, phenomena, and variables associated with collaboration.

Some of the disciplines looking at collaboration are social psychology, organizational theory, anthropology, economy, sociology, etc. Specific theories that review collaboration are interaction theories (Thibaut & Kelley, 1959), game theory (Axelrod & Hamilton, 1981; Axelrod, 1997; Hart & Mas-Colell, 1997; Lewis, 1969), exchange theories (Blau, 1964; Homans, 1974), integration theory (Blau, 1974b), power theories (Emerson, 1962; Mills 1956), attraction theories (Hollingshead, 1950), organization theory (Fayol, 1949; Mayo, 1945; McGregor, 1960; Katz & Kahn, 1966), and others.

Perspectives of Collaboration

In this section, some perspectives related to collaboration are described. All the perspectives come from different theoretical backgrounds and have different objects of study, and some of them represent the practitioner's position. They may contribute to a conceptual understanding of inter-organizational collaboration and may help to provide a holistic picture of the collaborative phenomenon. Essentially, each perspective gives different dimensions and conditions that facilitate the analysis of collaboration. No one of them is defined exhaustively. The perspectives presented include:

- collaboration among egoists,

- collaboration among strangers,
- collaboration as an exchange of resources, skills, and services,
- collaboration from power perspective,
- collaboration as an informal system of coordination,
- collaboration as a creative solution,
- collaboration as a competitive advantage, and
- collaboration between non-profit organizations and governmental sector.

Collaboration among Egoists

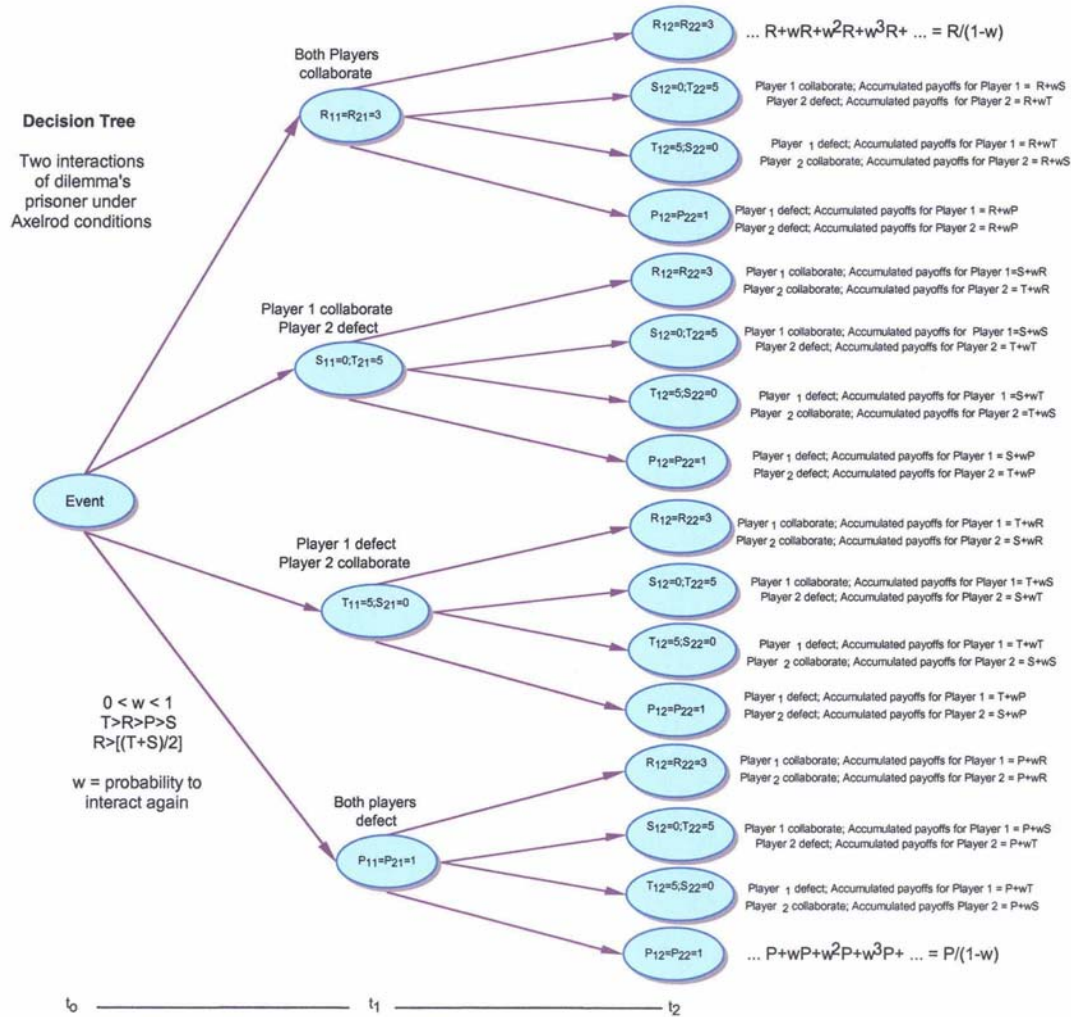
In a competitive environment, collaboration can emerge when individuals have a high probability to interact frequently in the future, and collaboration provides the best average rewards over the time. Axelrod and Hamilton look for answers to the question about how egoists can collaborate and tries to identify the circumstances under which they can collaborate. As egoists attempt to maximize their self-interest, collaboration appears like an unfeasible alternative. However, they seek to recognize the conditions in which they can collaborate, using the prisoner's dilemma (game theory), and computer simulation (Axelrod et al., 1981).

Axelrod et al. (1981) consider cooperation as an evolutionary process in which the interaction among actors has probabilistic attributes. The biological evolution paradigm emphasizes the predominance of the fittest and the endeavor for surviving. However, the argument about the selection process at the level of biological species or a population is weak because it cannot explain collaboration among the members of the same species, such as altruism and restraint in competition and conflict. In addition, it cannot explain collaboration phenomena among different species, such as symbioses.

The prisoner's dilemma can be expressed in the following way: two accomplices that perpetuate a crime are apprehended and interrogated separately. They are put in different cells, cannot communicate with each other, and they do not receive any kind of information for external sources. Each player has two alternatives, defeat or cooperate. Defection happens when one criminal decides to confess and tries to obtain a lighter sentence damaging his henchman, and the payoffs are temptation to defeat (T), tacking advantage of the one who collaborates, and sucker (S), the payoff for being the abused party. Cooperation happens when no one confesses the crime. The district attorney can just prove a minor charge, and the payoffs are rewards for cooperation (R). However, if both criminals confess (defect), they will get the maximum sentence, and their payoffs are punishment (P) (Axelrod, 1984).

Under the previous conditions, the dilemma has no solution. However, collaboration can emerge when individuals have to interact for a long period, which is expressed as a probability of continual interaction (w), and provides players with the best rewards over the time $\{T > R > P > S \text{ and } R > ((T+S)/2)\}$ (see Figure. 1), whenever both players decide to benefit their own interest or the common interest (Axelrod et al., 1981). However, if the probability of interaction between players is too low, collaboration is a risky alternative.

Figure 1. Title Decision Tree



The initial interactions play an important role in the evolution of cooperation. For example, if one of the players decides to defect in the first three interactions, it is highly probable that the other player will defect in the fourth interaction.

The prisoner's dilemma is a special case of game theory, decisions under total uncertainty and conflict, which is part of decision theory. Game theory studies decisions under total uncertainty and conflict. The prisoner's dilemma has several disadvantages: essentially, it is an analytical exercise; players cannot leave the game and communicate with each other, they are rational (Axelrod (1997) overcomes this restriction in his analysis), and both players know the possible payoffs, which is not necessarily true in a real collaborative effort. Also, the context of the game is not considered or any type of influence, and in general, it is difficult to apply in real situations. In Figure 1, it shows two interactions of the prisoner's dilemma following the conditions of Axelrod. When the probability to interact again, w , is constant and its value is less than one and bigger than zero, the interaction is a geometric series that converge to $(1/(1-w))$, which can be seen in the extremes of the decision tree in the figure 1

Collaboration among Strangers

Strangers do not have strong relationships, among other characteristics, and the few interactions they can have are accomplished in a context with low level of trust and high level of uncertainty. The only way in which strangers can collaborate is by using social conventions, which is the answer to Brown's (1995) question, how strangers can collaborate?

Using coordination games, Lewis (1969) defines a convention as "a uniform behavior that population members adopt to solve a specific problem; conventions are

regularities in behavior, sustained by an interest in coordination and an expectation that others will do their part” (p. 208). A convention promotes routines and voluntary behaviors among strangers, which facilitate the coordination of their actions to provide fair and satisfactory results, but not optimal in the solution of problems; however, accepting its outcome does not mean that strangers prefer those specific results (Brown, 1995).

Conventions are hard to come alive, but when they are robust, almost no one remembers how they were created, and to try to change them is complicated. In order to adopt them, they require a certain number of participants; the quantity depends on environmental aspects and the type of problem to solve. Boycotts, mass demonstrations, forming lines, lost and found offices, designated drivers, and no smoking places, are examples of conventions (Brown, 1995).

Many conventions are supported by implicit arrangements that are infrequently pondered and discussed. Some conventions can be the base of norms and laws, but a norm acquires different meaning, a right or wrong action. In a law, a convention acquires a character of legal obligation, and the government enforces its obedience (Brown, 1995).

Conventions may be one of the most important aspects in inter-organizational collaboration. They are established and take place among strangers, but also among familiar people. Small groups can have specific conventions, for instance family traditions. Also, each organization develops its own conventions. When a convention is successful, people involved usually express things like- *here, things work in this way*, while nobody remembers how or when the convention was initiated, these types of

behaviors are associated with the organizational culture. Similarly, conventions are developed among the members of a community (Brown, 1995).

Brown studies collaboration from a social perspective, giving emphasis to the coordination of public affairs among strangers, and he distinguishes among community and organizational conventions (Brown, 1995). In the social arena, social exchange theories have affected the conceptualization of collaboration. Exchange theories study different types of relationships, from love to economics relations (Blau, 1964).

Collaboration as an exchange of resources, skills, knowledge, and services

Social exchange among parties initiate because parties have expectations to obtain rewards and they maintain the collaborative effort as long as the exchanges are considered fair and rewarding. However, the value of some recompenses and obligations derived from the exchange cannot be specified in advance, which makes the interchange practice an evolving process. Equally important, satisfactory exchanges generate an integration process in which partners may come to believe that when taking care of others' interest, they are taking care of their own self-interest (Blau, 1964).

The focus of this work is on exchange of resources, skills, knowledge, and services in order to achieve collaborative goals. There are several perceptions represented in exchange theories. They conceptualize exchange as:

- an equilibrium of efficiency among participants (Walster, Walster, & Berscheid, 1978),
- a result of beneficial interactions (Thibaut et al., 1959),
- a balance of rewards and costs (Homans, 1974),
- a reciprocal constructive stimuli-answer relationship (Foa & Foa, 1974).

- a exchange of resources and services (Roloff, 1981), and
- a mutual rewarding integration process without central authority (Blau, 1964).

All of the above perceptions of exchange come from different exchange theories with different theoretical roots and different objects of study in which collaboration plays a small role. For the purpose of this investigation, Blau's ideas are just one of the main constructs used because he relates several concepts that help to understand the relationships among exchange, integration, and compliance of power relationships. Blau (1974a) explains how repeated social exchange develops patterns of exchange that could traduce into social roles, which provide some structure to the relationship. Also, he explains that social differentiation is the source of power, which is a connection with the next perspective analyzed in this work.

In order for collaboration to occur, parties must find each other attractive. Attraction depends on complementary needs, status, similar values, approachability, and repertory of valued skills, resources, and knowledge. Collaboration evolves slowly, starting with minor exchanges in which little trust is required because little risk is involved, and in which parties can prove their trustworthiness to each other, enabling them to expand their relationship, integration process, and engaging in major transactions (Blau, 1964).

The integration process and the trust drawn from major exchanges that involve incremental risks produce cohesion among the parties. However, the exchange process does not necessarily always produce positive results. For example, exchange creates dependability and vulnerability, and one of the parties may take advantage of the

others. In addition, dissatisfaction and sometimes alienation are the result when particular expectations are not achieved (Blau, 1964).

Collaboration from Power Perspective

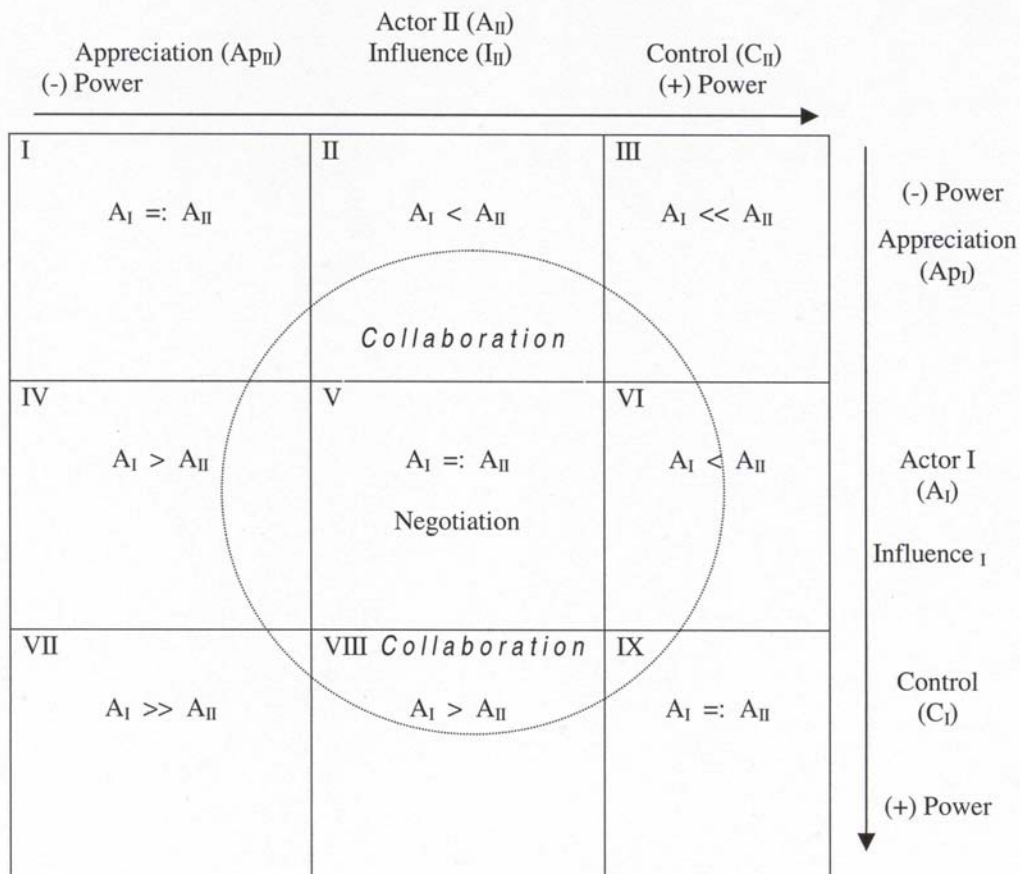
The dynamics of power relationships is complex; here, the idea is just to situate collaboration in the power context. In an environment without a central authority, with quasi-power symmetry, and interdependent relationships among actors, collaboration can be achieved by negotiation. None of the actors can force the other to do they want. Although extreme power asymmetry could prevail, it is not considered in this work because it requires analyzing, manipulation, compliance-power relationships, and conformity to powerful party, which are beyond the scope of this study.

According to Pfeffer & Salancik (1978), it is feasible to have some control over a common effort when actors can coordinate mutually dependent actions. In this situation, actions are not controlled by a hierarchical structure and command, but it is done by some type of agreement. The actors and organizations are a combination of interests that deal with contradictory demands in which the environment restricts them. In order to cope with environmental restrictions, actors develop strategies, and one of these strategies is mutual interdependence and collaboration.

Power is the “ability to do or affect something or anything, or to act upon a person or thing” (Oxford English Dictionary©). In this situation, power is the ability of persons or groups to impose their will on or to act upon others. Smith (1992) defines power at three levels: control (C), influence (I) and appreciation (Ap). With control, the highest level, an actor can impose their will by oneself. With influence, the medium level, an actor can impose their will indirectly. With appreciation, the lowest level, an

actor has information and understanding and can estimate the influence of some of the other actors' actions, but does not have control or influence to impose their will (Smith, 1992).

Figure 2. Power Perspective



Notation: (=:) Power equilibrium; (>) more power than; (<) less power than; (>>) much more power than; and (<<) much less power than.

Arrows represent the increment of power.

Using a matrix, a relationship between resources and power can be established because an actor's power depends on the quantity of resources she dominates. In Figure 2, collaboration is located around box V (Morales-Arroyo, 1993).

The ideas of Smith (1992) were used to explain power. He provides a very practical way to understand power without discussing the complexity of power phenomenon. He equalizes the level of power as the quantity of resources that can be accessed by the actor, and these resources could be intangible like information and knowledge.

Collaboration as an Informal System of Coordination

An informal structure promotes collaboration because it facilitates the coordination of activities, which is founded on social networks and personal interaction. Informal coordination derives from everyday personal agreements, needs, and interactions, and compensates for failures resulting from inadequate adaptation of formal agreements to particular conditions (Chisholm, 1989).

When organizations collaborate, they try to solve a common problem using formal mechanisms of coordination. Usually, a formal proposal for the solution of a problem is incomplete, and frequently, a formal structure establishes some kind of hierarchy with central authority. Formal structures are not flexible and fail to supply sufficient resources for the realization of their purposes. Also, when the lack of routines is a constant, the bureaucracy works slowly. Therefore, informal structures of coordination emerge to compensate insufficiencies resulting from inadequate adaptation by the formal structure to specific circumstances. In other words, formal structures are frequently unsuccessful to provide sufficient means opportunely for the achievement of their goals (Chisholm, 1989).

Informal structure emanates from everyday trial-and-error and adjustments to particular goals promoting compromises in situations with divergence and dissent. Also,

roles constantly delineated by experience, and definition of tasks is decided by negotiations, but not by any central authority. In addition, informal structures act in response to the consequences of problems in sight. They may be composed of elements of similar level, and they are flexible and adaptable, problem oriented, pragmatic, based on trial-and-error experiences, self-organizing, and innovative. In spite of all advantages, informal structures require formal structures to subsist and to decentralize activities, which benefit horizontal relationships (Chisholm, 1989).

Informal structure is rooted in networks of individuals, and works better because of the common trust that resides between individuals. An informal structure, regardless of its advantages, can be used for anti-ethical activities, such as favoritism. It is relatively hidden, which makes it difficult to inspect and comprehend. Also, it is vulnerable to high rates of changes in its members. The creation of informal relationships is time consuming and the formal structure has little control over it. Coordination is inhibited when decision makers have different premises (Chisholm, 1989).

Collaboration as a Creative Solution

How can members of a collaborative effort generate creative solutions? Schrage (1990) conceives collaboration as a goal-oriented process of shared creation in which the intention is to solve a problem, survive, create something, or the routines are disrupted by changes in the environment. Also, collaboration is initiated when traditional solutions applied to a problem cannot be employed any more, and it should generate value for each partner. Moreover for John-Steiner (2000), interdependence among creators is fundamental to produce new knowledge.

Collaboration is not a predictable and routine activity. In fact, parties collaborate because they cannot face up individually to the challenges they are confronting and/or do not know how. Not only are the particular talents of each party important, but also the capacity to amalgamate them. Furthermore, collaboration creates a shared meaning about processes and events, and in general a common mindset, which is mandatory for defining how to go from the initial point to a common goal (Schrage, 1990).

Collaboration among intellectuals or artists requires interdependence to produce new creations and knowledge. Partners negotiate their differences while they are generating their shared vision. Intellectual collaboration evolves through dynamics of joint efforts, common interests, synthesis, changes, disagreements, and separation. According to John-Steiner (2000), there are four patterns of collaboration: distributed, complementary, familial, and integrative.

Distributed collaboration is extensive among groups with similar interests, and the participants' actions are informal, voluntary, spontaneous, and responsive. A division of labor based on complementary expertise, roles, temperament, and similar partners' values distinguishes complementary collaboration. In family collaboration, flexible roles and responsibilities may change over the time, generating a dynamic integration of expertise. In this collaborative pattern, partners share a common vision and trust each other. Integrative collaboration achieves changes that transform previous intellectual perceptions in which the partnerships require a prolonged period of visionary commitment. Therefore, partnerships prosper based on communication, risk taking, and a common vision. John-Steiner (2002) states, "In some cases, the participants construct a common set of beliefs, or ideology, which sustains them in periods of opposition or

insecurity” (p. 203).

Collaboration as a Competitive Advantage

Basically, an organization can improve their performance by taking advantages of alternatives available inside of its own boundaries, such as reducing costs or increasing effectiveness, employing total quality management (TQM), and re-engineering. In some cases, most of the expenses in profit organizations come from the purchase of goods and services, which represents about 55% of its expenses in typical manufacturing organization. Dependency on providers is a fact, so it is reasonable to establish relationships to create new opportunities, to learn from others, and to reduce duplications and waste of resources. The alternative is to collaborate (Rackham et al., 1996).

Collaboration can produce competitive advantages but requires three elements: impact, intimacy, and vision. The first element, the capacity of the partners to produce concrete outcomes, is manifested by increments of effectiveness, better services or quality, cost reduction, or any path to add value. Specifically, there are three ways to increase impact: reduction of duplication and waste, utilization of expertise and essential competence of the other partners, and the creation of new opportunities. The second element, generating and maintaining a close relationship that goes beyond impersonal interaction, requires building trust, information sharing and reciprocity, and building a strong team. The third element, a shared objective and the way partners are going to achieve it, considers the potential of the collaborative effort, develops initial propositions, establishes a joint feasibility team, and creates a shared vision (Rackham et al., 1996).

The complexity involved both to introduce products and/or services in new markets and to develop high-technology products and projects forces companies to collaborate in order to create value. For example, laptops require components that no one organization can create and manufacture all the important parts or have all the required skills by itself (Doz & Hamel, 1998).

Collaboration between Nonprofit Organizations (NPO's) and the Governmental Sector

The relationships between governmental institutions and non-profit organizations are essentially complementary and collaborative. Collaboration, parties with similar goals and similar means, is characterized by pluralism, no power symmetry, shared norms, coordination of activities, open communication, and free flow of information. Meanwhile, complementary relationships, parties with similar goals and dissimilar means, happens under different conditions when non-profit organizations fulfill a role that may be performed by the government, but often are reluctant or incapable to carry out (Najam, 2000).

A transitory and unstable relationship called co-optation exists when a party with dissimilar goals and similar means tries to convince the others that their goals are a subset of their own. Also, co-optation can turn into confrontation, mutual manipulation and the distress is directly affected by the power asymmetry. Confrontation, dissimilar means and dissimilar goals, takes place when parties consider the others' goals as unethical. Consequently, there is an open or hidden disagreement in the relationship. Although, confrontation does not entail hostility, it implies policy resistance and disobedience (Najam, 2000).

Amalgamation of Collaborative Perspectives

In order to analyze the problem of collaboration, each perspective is represented by concept maps (Novak, 2000) and cognitive mapping (Eden, Jones, & Sims, 1983). According to Novak (2000), "Concepts maps are tools for organizing and representing knowledge. They include concepts, usually enclosed in circles or boxes of some type, and relationships between concepts or propositions, indicated by a connecting line between the concepts" (p.1). Cognitive mapping is a similar to concept maps, but the difference is the addition of bi-polar constructs, which means the relationships between concepts or propositions creating a dichotomy.

The KJ method was used to integrate the perspectives of collaboration. The KJ method procedure as follows:

- factors and concepts related to collaboration were identified, using brainstorm technique, and the concept maps,
- factors and concepts were transferred to cards,
- the cards were sorted,
- cards were grouped by topic, looking for similarities, and
- an affinity diagram was drawn (Mizuno, 1988).

Another technique used was morphological analysis, in order to connect a concept that has not been connected before in the literature. The objective of this technique is to contrast the basic elements in a matrix in order to find new relationships among those elements (Zwicky, 1969; Gerardin, 1973).

The perspectives of collaboration provide a set of concepts that are essential to understanding collaboration. Table 1 summarizes the most relevant aspects of each

approach. The second column refers to the conceptual roots, the third one to the conditions under which collaboration is developed, the fourth, fifth, and sixth columns express the factors that produce, maintain, and reduce collaboration respectively; the final column is related to the type of environment in which each approach is studying collaboration. The collaborative process is not showed because it is developed with more detail later in this Chapter.

Table 1

Perspectives of Collaboration

<i>Perspective</i>	<i>Based on</i>	<i>Conditions</i>	<i>Producing collaboration</i>	<i>Maintaining collaboration</i>	<i>Reducing collaboration</i>	<i>Environment</i>
Egotists	Game Theory Computer simulation	Uncertainty Conflict	Interaction for a long period Satisfactory rewards Predictability of behavior Routines & Rituals	Imitation of collaborative behaviors & familiarization Friendly interaction Ethical behavior Care about other's welfare	Competitiveness	Not considered
Strangers	Coordination Games & Public affairs	No Central authority Interdependency	The need to solve interdependent problems Avoid chaos	Expectation others will do their parts Fair & satisfactory results Number of participants that follow the convention	Self-interest Lack of fairness Uncertainty	Society Community Organization
Exchange	Sociology	No Central Authority	Expectations to obtain rewards Common attraction Lack of knowledge Lack of skills Lack of resources	Rewarding exchanges Coordinate actions Accepting actual costs for future benefits Integration process based on trust	Lack of fairness	Society
Power	Power relationships	Quasi-power Symmetry No Central authority	Interdependency Impossibility to force or manipulate others to obtain the needed resources	Satisfactory agreements and results	Conflict of interests	Competitive Uncertainty Political
Informal coordination	Human interaction between organizations	Uncertainty Fails of the formal agreements No central authority	The necessity to interdependently coordinate activities to achieve common goals Social networks	Satisfactory results	Lack of reciprocity Lack of fairness	Inter-organizational
Creative Solution	Creativity	Uncertainty Complexity	Need to solve complex problems Lack of knowledge Lack of skills	The motivation to find new solutions	Inertia Time Prejudice Competition	Complexity
Competitive Advantage	Strategic Management	Opportunities & threats	The degree of value perceived from common opportunities	Maintaining the relationship: building trust, information sharing and reciprocity	Lack of understanding Lack of results Risks	Competitive
NPO's & Government	Policy making	Asymmetry of power Threats	Not addressed	Similar goals	Confrontation	Political

Two concepts from Table 1 require more explanation: no central authority, and quasi-power symmetry relationship (written as quasi-power symmetry). In the first one, collaboration may exist with central authority or without it. If central authority exists, some of the roles between/among partners are present, and hierarchical structure controls resources, activities, priorities, and define goals. Agreements do not need to be negotiated. In the opposite situation, the negotiation of agreements is fundamental, and partners have the capacity to make decisions and abandon the collaborative effort. One condition needed to have collaboration without central authority is that participants have, in theory, the same level of power, power symmetry, or at least quasi-power symmetry.

Determinants and Consequences of Collaboration

Determinants of Collaboration

Some of the elements that determine collaboration are positive expectations, factors that produce collaboration, factors that harm collaboration, and factors that benefit collaboration.

Positive Expectations

Expectations should be flexible and realistic (Doz, 1996), create value (Rackham et al., 1996), be shared by partners (D'Aunno et al., 1987), add value (Rackham et al., 1996; Schrage, 1990; Doz, 1996), and value appropriation (Doz, 1996). Partners' expectations should increase rewards and the quality of results (Mattessich et al., 1992), satisfy self-interest and necessities of each participant (Brown, 1995), benefit the common interest (Schrage, 1990; Doz 1996), develop common frames of reference (Doz et al., 1998), share a mindset (Schrage, 1990), and reduce ambiguity (Doz, 1996).

Factors that Produce Collaboration

Motivators of collaboration are provoked in general by necessities, junctures, crises, and opportunities (Winer & Ray, 1994). Specifically, some of the factors that are forcing collaborative efforts are pressures derived from the globalization process: deregulation, privatization, the opening of national markets, and the race for the future: the information age, telecommunication and computer technology, which benefit organizational networks, but not hierarchical structures (Doz et al., 1998). Although, non-profit organizations are not directly affected by competitive market forces like profit organizations are: Globalization is demanding more efficiency and effectiveness from all type of organizations (Drucker, 1990).

In general terms, new technologies, globalization, and limited resources are compelling non-profit organizations to collaborate. Pressures originated from these factors are expressed as uncertainty to obtain valued resources or similar types of dependencies (D'Aunno et al., 1987). Traditional solutions do not provide satisfactory results any more, and lack of knowledge and skills make it difficult to adapt new work procedures to cope with the new users' needs (Schrage, 1990). Additionally, there is the need for the knowledge of competences of another under conditions of trustworthiness.

Factors that Benefit Collaboration

Partners working in a collaborative effort have expectations about the possible benefits they may be able to attain, and frequently, they accept actual costs for future benefits (Blau, 1964). Over time, partners should receive accumulating rewards (D'Aunno et al., 1987), They have the conviction that the others are contributing to the solution (Schrage, 1990), and should be ready to place collaborative interest first

(D'Aunno et al., 1987). They have a disclosure process among participants and sometimes develop interest over some of the particular problems of the others (Axelrod, 1984). Previous relationships between partners and reputation reduce risk (Blau, 1964; Granovetter, 1985), also shared values and expectations, which facilitates taking risks for organizational resources (D'Aunno et al., 1987). In addition to the previous aspects, partners should establish, when it is possible, mechanisms for coordination and control, decision-making procedures, evaluation, etc.

Based on similar values and expectations, organizations may build lasting and beneficial associations. Building strong relationship requires not only to look for the satisfaction of one's own problems, but also to look at the problems from the others' perspective, and a good match among people, which produces synergy. In order to have the opportunity to access the others' perspective and get a good match, a high degree of trust is needed (Rackham et al., 1996). Furthermore, the ultimate effect undertaken in collaboration is to achieve added value by using a learning process based on realistic goals and lining up the partners behind them (Doz et al., 1998).

Mattessich et al. (1992) make a comprehensive classification of factors that benefit collaboration in non-profit organization. Their categories are environmental, membership, structure/process, communication, purpose, and resources. Environmental aspects are the circumstances that delimited the collaborative effort. Factors included in this category are common history, partners' reputations, and the political/social climate. Membership factors relates to skills, attitudes, and opinions of the people working in the collaborative effort, as well as the culture and capacity of their organizations. Factors of this category are mutual respect, understanding, trust,

stakeholders, rewards, and commitment (Mattessich et al., 1992).

Structure/process factors are related to management, decision-making, and operational systems. The factors are: members' benefits, multiple levels of decision-making, flexibility, development of roles, guidelines, and adaptability. Communication factors relate to channel used, information and opinions shared, and the information for their organizations. Specifically, partners should develop an open and frequent communication, and establishing informal and formal communication relationships (Mattessich et al., 1992). Purpose factors are incentives for collaborating. In other words, a shared vision, realistic goals and objectives, and unique purpose that cannot be achieved by isolated members. Finally, resource factors are enough funds and skilled negotiators, champions, and/or project leaders (Mattessich et al., 1992).

Factors that Harm Collaboration

The literature proposes aspects that affect negative collaboration, such as uncertainty (Brown, 1995; Doz et al., 1998), ambiguity (Doz et al., 1998), risk (Ring & Ven, 1992), competitiveness (Doz, 1996), and selfishness (Brown, 1995). At a more operative level, other aspects are change of priorities and the difficulty to predict the evolution of collaboration (Doz et al., 1998), lack of routines, lack of fairness (Blau, 1964; Brown, 1995), lack of information (Nock, 1993), restrictions, inertia, time, prejudices, and complexity (Schrage, 1990), external-internal organizational conflict (Doz & Hamel, 1998; Isenhardt & Spangle, 2000), and organizational politics (D'Aunno et al., 1987).

Consequences of Collaboration

The consequences expressed here are linked to the benefits of collaboration,

negative aspects, and alternatives to avoid abuse.

Benefits of Collaboration

Collaboration allows partners to achieve goals that will be impossible to attain if they were working independently and solving complex problems; to do a wider, more complete scrutiny of concerns and options; to make services, skills, and resources more available (Mattessich et al., 1992); to learn new skills and knowledge (Doz, 1996); to solve complex problems (Schrage, 1990; Brown, 1995); to create new solutions (John-Steiner, 2000; Schrage, 1990); to generate new opportunities (Schrage, 1990; Mattessich et al., 1992); to reduce risk (D'Aunno et al., 1987); and to save money by reducing costs and investment risks (Kumar & van Dissel, 1996). Other benefits are to increase rewards and quality of results (Mattessich & Monsey, 1992), satisfy self-interest and necessities of each participant (Brown, 1995), and the rewards derived from a common interest (Schrage, 1990; Doz, 1996; Mills, 1956). Also, members participating in a successful collaborative effort increase their reputation as good partners (Mattessich et al., 1992).

Negative Aspects of Collaboration

Although, many positive outcomes can be attained from collaborative efforts, there are negative consequences. The impossibility to collaborate hinders coordination of activities, which produces chaos (Brown, 1995). For example: corruption (Axelrod, 1984); fraud (Granovetter, 1985); loss of control (D'Aunno et al., 1987); conformity, economic collusion, and exclusion of non-collaborators from position of power (Smith et al., 1995).

The literature reviewed does not provide a mechanism to avoid abuse in

collaborative relationships. In this literature, trust is considered as an essential element in collaboration. Some of the recommendations of how to avoid the abuse of trust may apply to collaboration. Some examples are: reduce delegation, commitment, participation, and dependency; spread risks; look for other alternatives; to develop strong personal relationships; stop collaborating (Shapiro, 1987); to use formal agreements (Ring et al., 1992; Ring et al., 1994); to work with parties with good reputation; and to use surveillance mechanisms (Nock, 1993).

The determinants and consequences of collaboration are represented by an Ishikawa diagram, known as a cause-effect diagram or fish-bone diagram, in which seven main components were found affecting collaboration. In this case, collaboration is represented in this diagram by a black box; the causes are represented in the left side of the diagram, and the effects on the right side. For more details see Figure 3 (Ishikawa, 1985).

Variables and Factors that may Affect Collaboration

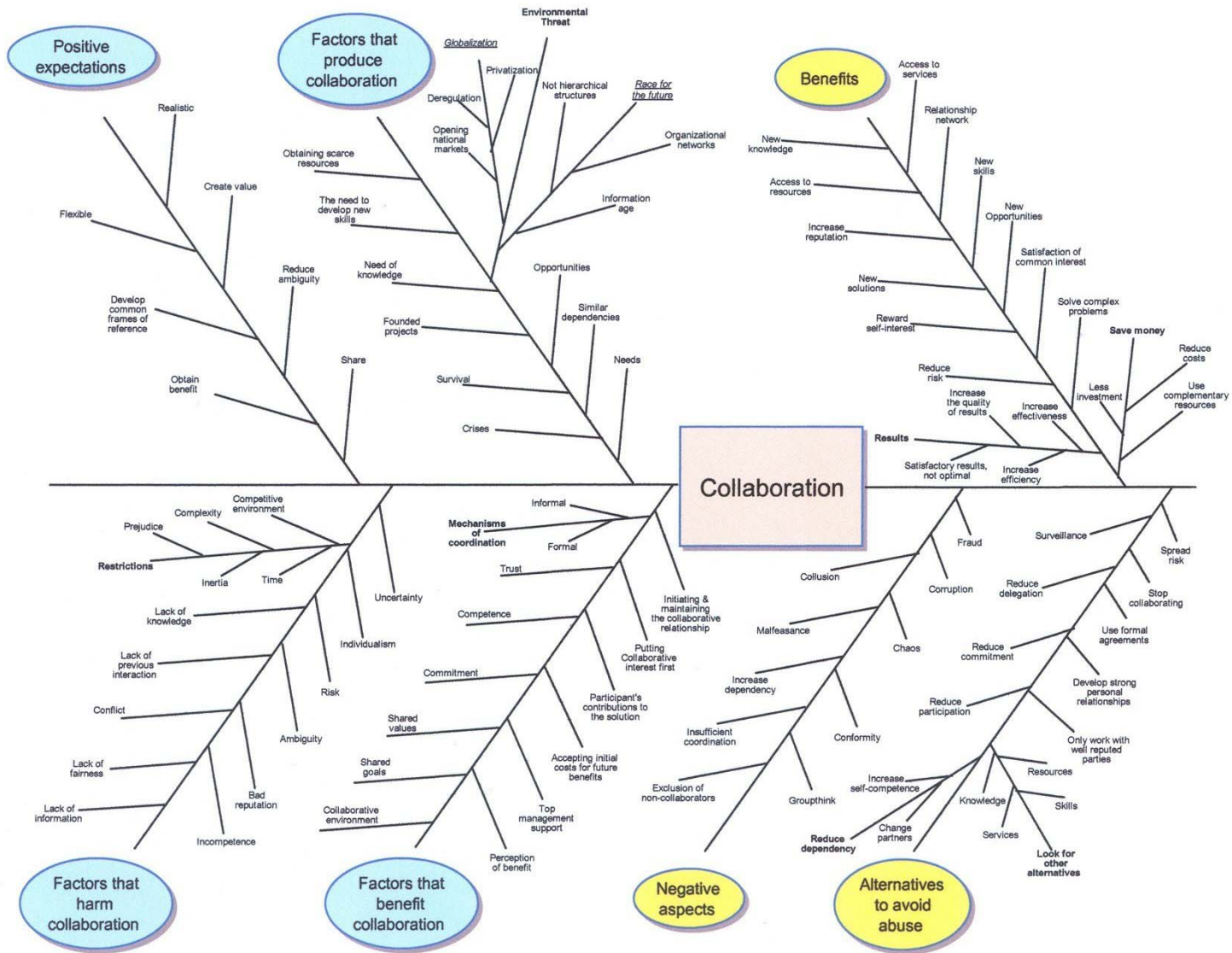
The elements of collaboration analyzed in this section are trustworthiness, commitment, competence, uncertainty, risk, interdependence, coordination, complexity, and integration. It is supposed that all of these elements can have different levels. The relationships among these elements, as well as their levels may affect the collaborative effort. The literature and contributors to the literature in each conceptual area are extensive and beyond the scope of this study. The author has selectively chosen conceptualizations and/or research by a limited subset of scholars whose ideas appeared to be the most relevant and useful to explore the type of collaboration studied here. In few words, the selection of the literature comes from an eclectic selection.

Trustworthiness

In the past, everyone living in small communities knew each other, and privacy was low or nonexistent. Good reputation, the perception of conformity with moral standards of the community, was the source of trust, and was associated with the family name. Specifically, parents were in charge of their children's behavior. Trusting someone signified a willingness to share and to follow the same moral precepts. In order to verify the attachment to the moral standards, all members of the community monitored each other's behavior (Nock, 1993).

In a society of strangers, anonymity reduces trust because other's behavior cannot be predicted nor can the level of competence be determined without some kind of reliable source of information. In order to reduce this problem, societies have developed surveillance mechanisms that allow us to trust unfamiliar people by using credentials and ordeals. A credential provides a person evidence of qualifications or authority (driver's license, doctor's degree, etc.), and an ordeal is an experience that concludes whether a person is expressing the truth (lie detector or drug testing). The costs of privacy are surveillance and problems derived from dealing with strangers (Nock, 1993).

Figure 3. Fish Bone Diagram



The creation of a relationship is a slow process and commences with small transactions in which little trust is needed because little risk is implicated (Blau, 1964). Trust, an indispensable component in a relationship, increases as the relationship evolves (Chisholm, 1989). Initially, exchanges are based on the “norm of reciprocity” (p. 114) and expresses that people should help and not harm those who have helped them. The norm of reciprocity is a foundation of virtually every society and is accepted in moral systems universally (Chisholm, 1989).

Based on the *norm of reciprocity*, someone can give the first step to create a relationship with the expectation the other will pay back in the future. Because the recipient decides when and how to give back the favor or whether the recipient reciprocates it by any means, exchange flourishes when there is the obligation to reciprocate (Blau, 1974a). The obligation of repayment does not depend on having a good attitude, but on the possibility to lose future benefits, reputation, and the conformity to the norm of reciprocity. The lack of reciprocity hampers the expansion of the relationship and engenders distrust (Chisholm, 1989). Under the previous condition, trust is difficult to flourish and maintain (Sydow, 1998).

Initially, successful exchanges between parties are evidence of trustworthiness, which allows parties to expand their relationship and immerse in more significant and risky exchanges. No relationship is solidly defined until bonds based on reciprocal exchange are achieved (Blau, 1974a). Many of the exchanges are informal, which provides flexibility and allows going beyond the constraints of formal agreements (Chisholm, 1989). Frequent and constructive contacts promote the increment of trust (Axelrod, 1984), consideration, and respect and are important to the development of the

relationship (Chisholm, 1989). The function of exchange appears to be the creation of trust (Blau, 1964).

Parties may comply with a set of exchange rules only based upon actors' roles when they are satisfied and agree with the exchange practices. Trust may transcend the concrete exchange experience and specific actors and parties can trust not only concrete persons, but also abstract systems (Sydow, 1998). Consequently, relationships may be founded on either personality traits or on their roles (Guiot, 1977). Sources of this kind of trust are traditions, common practices, and credentials (Sydow, 1998).

Each human relationship includes "some degree of trust and distrust" (Govier, 1998, p. 3). Trusting others, people accept risk and vulnerability, assume another's integrity, interpret other's actions favorably, and have expectations of other's benevolent and harmless behavior based on beliefs of other's motivations and competence (Govier, 1997). However, trust may generate circumstances for taking advantage of trust relationships because sophisticated regulations that guarantee trust may also create distrust (Shapiro, 1987).

High trust, low trust, trusting more, and trusting less, are expressions that are not precise enough. All the previous terms do not define context, evidence, trustful actors, or levels of trust. Govier (1997) suggests that it is better to use trustworthiness as a concept than trust. Trustworthiness is based on evidence of previous interactions with specific actors in which reliability, concerns for others, and capacities to perform tasks and to be responsible have been demonstrated.

Commitment

Commitment is compromise, obligation or responsibility, and the ability to stick to the objective or course. Members' commitment has been identified as an element that affects collaborative effort (D'Aunno et al., 1987; Clark & Morton, 1997; Castell, 1988; Kaplan, 1998; Winer et al., 1994; Doz, 1987/1988; Browning, 1995). Expressions related to commitment are frequently found in research reports. Phrases like- starting with a transparent, unambiguous commitment (Deden, 1998); collaborative projects require involvement in planning (Harrel, 1996; Winer et al., 1994; Kaplan, 1998) and extended time commitment (Harrel, 1996; Lee-Mortimer, 1993).

The movement of quality control developed collaborative methods for working mainly in factories in Japan, specifically one of the initial mechanisms is called quality control circle. Five aspects were accentuated in those collaborative groups: 1) voluntarism, 2) self-development, 3) mutual development, 4) total participation, and 5) continuity (Ishikawa, 1985). Total commitment is required from the top and middle management (Ishikawa, 1985; Clark et al., 1997; Lee-Mortimer, 1993).

Commitment becomes involved in the decision process before and after making a selection (Janis & Mann, 1977). It is driven by expectation, based on incremental exchanges, and molded on agreements either formal or informal. An agreement is a mutual understanding that shapes expectations and defines wished goals, responsibilities, structures, controls, and actions to achieve the goals (Ring et al., 1994).

Informal relationships based on informal understandings among partners enhance the probability of formalizing relationships using formal commitments. In case parties infringe commitments and wish to maintain the collaborative relationship, more

intricate and strict protections will probably come out over the time (Ring & Ven, 1994).

Informal agreements supplant formal agreements as dependence on trust among parties' increases over time. When the time spent on a collaborative effort augments, the probability that the collaborative effort comes to an end reduces when a commitment infringement takes place. Trusting in the benevolence of other parties is an additive process of past interactions among parties, through the previous process, parties disclose each other and evolve their relationship creating mutual understanding and commitments (Ring & Ven, 1994).

Competence

Competence can be understood as effectiveness. Blake & Mouton (1964) established that effectiveness depends on the manager's leadership style that has two dimensions: concern for people and concern for results. Similar dimensions are used in some constructs in communication style and cultural differentiation. For example, gender orientation style has masculinity (instrumental) and femininity (expressive) components (Wheeless & Lashbrook, 1987), masculinity dimension in cultural differentiation (Hofstede, 1980); social style has assertiveness, responsiveness and versatility elements (Wheeless et al., 1987; Merril & Reid, 1981).

According to Barge (1994), "a person is considered competent when he owns significant knowledge, skills, and aptitudes to carry out a specific work. Also, a competent individual accomplishes proper actions. However, knowledge of the proper actions without its performance does not show competent behavior. Competence is the impression that others perceive, which means that competence is situation dependant. Furthermore, a competent human being tries to fit into his environment by executing

acts that are acceptable, appropriate, and effective” (p. 239). However, competence is more than just fitting into a specific environment because it could transcend the environment by modifying the regulations and standards that conduct shared acts (Barge, 1994).

Spitzberg and Cupach (1984) define fundamental competence as people’s ability to adapt, interact, and even alter their changing environment in order to survive, to mature, flourish, and achieve goals over the time. In order to adapt and modify the changing environment, people develop context awareness that is the ability to identify, discriminate, and adjust their environment. People require two types of knowledge: knowing what to adjust and knowing how to modify their environment. Fundamental competence includes the cognitive capacity to (a) manipulate significant information from the context, (b) choose the most significant information to perform a specific activity, and (c) create new patterns by reframing by known precedents to satisfy changing requirements (Spitzberg & Cupach, 1984).

Uncertainty

In the inter-organizational relationship context, there are four main sources of uncertainty: 1) environment, 2) partner(s), 3) task, and 4) future events. Uncertainty is usually associated to the environment. Everything that is out of the immediate control of organizations is the origin of uncertainty, which is a characteristic that varies from culture to culture (Hofstede, 1980). Also, uncertainty is defined as the lack of information: impossibility to designate the likelihood of potential events, known as future states of nature in decision theory, the lack of knowledge about origins and consequences of problems, and incapability to forecast the results of decisions

(Thomas, Ketchen Jr., Trevino, & Jr., 1992). For Browning (1995), uncertainty happens when partners experience the lack of order, the lack of social order and the lack of order in their tasks, and partners do not know how to behave or what is important to do.

Examples of uncertainties linked to tasks may be the lack of knowledge related to the work at hand, inconsistent and variable requirements (Keil, Tan, Wei, Saarinen, & al., 2000) and objectives (Doz, 1996), imprecise estimation of project advance (Keil et al., 2000), and initial disorder produced by new tasks, and social and physical environment (Browning, 1995). Uncertainties related to a partner can be expressed with the following question: how reliable are the partners? Partners depend on trust to reduce uncertainty (Ring et al., 1994; Thomas et al., 1992), anticipating the obligation to reciprocate (Kumar, van Dissel, & Bielli, 1998) and predicting the behavior of others (Nock, 1993).

A closely related concept to uncertainty is ambiguity. Ambiguity is the result of multiple interpretations of the same information (Thomas et al., 1992). Under uncertainty circumstances stakeholders do not have information, but under ambiguity conditions stakeholders have the same information with different interpretation. Uncertainty and ambiguity are phenomena always present when multiple actors from different organization come together with different priorities and objectives (Thomas et al., 1992).

Risk

Risk is the possibility of loss or damage. In the inter-organizational collaboration context, several types of risk have been identified. Partners might overuse or deteriorate resources damaging the enduring feasibility of their project. Sometimes, one of the

partners' deviates, misapplies, or steals common resources for their private benefit.

Connected to political issues, risk exists when a dominant partner may use a controlling position to intentionally damage other parties, or when different regulation may apply in different countries, giving advantages to one of the partners (Kumar & et al., 1996).

Linked to the interaction, the transaction risk is the cost of exploitation in the association (Kumar & et al., 1996; Ring et al., 1994). Transaction risks can derivate from the capital that has not helped to achieve the common goal, but it helps to maintain the relationship; from an information asymmetric, the impossibility to supervise performance by all partners; from the lost of control over resources, and from partners disparities (Kumar & et al., 1996). Additionally, the risk of project escalation can evolve when executives become strongly attached to technologically complex projects, and they are incapable of identifying the total failure of their endeavor (Keil & Ramiro, 2000).

A common factor identified as source of risk is the lack of information ((Nock, 1993); (Ring & et al., 1992)). An additional factor is the lack of top management commitment to the project (Juran & Jr., 1970). Top management delegates and gives unrealistic due dates which is not an infrequent complaint of middle management (Keil, Cule, Lyytinen, & Schmidt, 1998). Sources of risk can come from the partners and are related to opportunistic behavior (Kumar et al., 1996) and the sufficiency of resources, knowledge, skills, staff, and management. Environmental risks come from unexpected natural events, such as natural disasters and changes in the environment (Keil et al., 1998; Ring et al., 1992).

A collaborative effort progresses when partners incrementally take risks, and they increase trustworthiness (Doz, 1996; Ring et al., 1994). In fact, risk can be a

motivator for collaboration when parties confront some type of threat, and they try to share risks (Kumar et al., 1996; Ring et al., 1994). However, when partners have high-risk perceptions about their project, they are cautious (Doz, 1996). Finally, risk and reliance on trust define the type of governance structure that partners will use to manage their collaborative effort (Ring et al., 1992).

Interdependence

The Oxford English Dictionary© defines interdependence as “the fact or condition of depending each upon the other; mutual dependence”. Specifically for Axelrod (1984), it is the possibility of future interactions, for John-Steiner (2000), interdependence may help to produce new creations and knowledge, and for Browning (1995), it is a motivator for collaboration. Interdependence has been identified as a factor that affects collaboration (Smith et al., 1995; Axelrod 1984; Doz, 1996; Browning, 1995; Kumar et al., 1996; Meyer, 1993).

Thompson (1967) provides three levels of interdependence inside of organizations. First, pooled interdependence in which each part supplies to the totality, and the totality sustains each part. Second, sequential interdependence is a consecutive arrangement; the outcomes of one part are the raw materials of another. When sequential interdependence is present, pooled interdependence is present too. Third, reciprocal interdependence occurs when parts interchange resources and services reciprocally. The more interdependence there is among partners, the more difficult it is to coordinate activities among them. The level of contingency increases when the level of coordination and interdependence needed is high.

Kumar et al. (1996) extends Thompson’s classification from the internal

organizational context to inter-organizational one. He modifies the pooled interdependence definition in the following way: parts share and use common resources, except that they are independent in other aspects. In reciprocal dependency parts provide their work from side to side among them. The level of interdependence is a significant factor related to the extent in which one part can damage the other. In other words, the more interdependence among parts, the greater the premeditated or accidental damage an organization can cause another (Kumar et al., 1996). Similar concern is expressed by (Doz, 1996); integrative tasks create a high level of interdependence, which makes the learning process difficult. Moreover, interdependence requires structure, which is provided by coordination mechanisms (Kumar et al., 1996), and recognizing interdependence is a requirement for serious negotiations among partners (Meyer, 1993).

Coordination

Ven (1976) establishes that most of the scholars investigating inter-organizational relationships have been interested with the structural aspects of coordination. The interest in the process of coordination is reasonable because the lack of coordination is normally the cause of failures in achieving concrete outcomes.

According to Fayol (1949), coordination is one of the five elements needed in the management of organizations. Coordination “is to harmonize all the activities of a concern so as to facilitate its working, and its success” (p. 103). Coordination includes: (a) deciding the order and timing of actions in an order they can correctly engage; (b) assigning priorities and the correct amount of resources and time; and (c) adjusting the alternatives available to the objectives.

When activities are coordinated rightfully in an organization, the following conditions exist: (a) every area labors in concordance with the others, (b) in every area, the vertical structures are accurately informed about what to share and their responsibilities in the common efforts and the mutual support they have to give each other, (c) the operational schedules of different areas should be frequently adjusted according to their needs and conditions (Fayol, 1949).

Thomson (1967) defines three levels of coordination: coordination by standardization, coordination by plan and coordination by mutual adjustment. Also, he establishes relationships between the levels of coordination and the levels of interdependence. Explicitly, pooled interdependence is associated to coordination by standardization, sequential interdependence is associated to coordination by plan, and reciprocal interdependence is associated to coordination by mutual adjustment. Standardization necessitates a smaller amount of decisions and a less frequent interchange of information than coordination by planning, and planning requires a smaller amount decisions and a less frequent interchange of information than mutual adjustment. Coordination by mutual adjustment is the most expensive because it involves more decision-making, and more interchange of information than the other type of coordination (Thompson, 1967). The level of contingency is the highest with reciprocal interdependence because activities of every party must be adapted to the activities done by others. The constant interaction increases the probability of misunderstandings between interrelated parties intensifying the risk of conflict (Kumar et al., 1996).

Chisholm (1989) describes two types of coordination: formal coordination with a

hierarchical structure and central authority, and informal coordination with informal horizontal links and no central authority. The formal coordination derives from the formal design of inter-organizational collaboration, and the informal coordination derives from the everyday agreements, needs, and interactions, and compensates for failures resulting from inadequate adaptation of the formal agreements to particular conditions. The disadvantages of formal coordination are that it is time consuming, has an incomplete design, and incapability to provide sufficient resources, obsolescence, and the creation of ambiguity about the responsibility for troubles not delineated in the original plan. The disadvantages of informal coordination could be that managers do not have formal control over it, obscurity makes it difficult to examine and understand it, and it can be used for anti-ethical activities, and is a trial and error process (Chisholm, 1989).

Kumar et al. (1998) give an example of inter-organizational coordination existing in the textile industry in Prato, Italy, in which coordination is based on trust, tradition, social rules, and the lack of contracts among small organizations. A Pratesian entrepreneur, the *impannatore*, gets a job order and allocates labor to a dynamic production chain that can change from order to order. She does not invest her money, and can adjust her commercial activities to market variations. The *impannatore* plans and coordinates the production, and may carry out some phases of the production, but she does not have any type of formal influence over her partners (Kumar et al., 1998).

Horizontal communication between contiguous parts allows the coordination in the production process instead of the information provided by the *impannatore*. This production process is dynamic and self-managed in which resources and information

come from one production stage to another with small interference or control by the Pratesian entrepreneur. Frequently, the *impannatore* communicates simply with the initial and final firm in the process, and with others only for tracking purposes, in case of problems or exceptional conditions.

Coordination requires a structure that allows the provision of resources in time (Chisholm, 1989; Kumar et al., 1996) A structure is the way in which inter-organizational tasks are shared among the organizations. Each organization has their particular roles and coordination should be accomplished among those roles. In other words, structure is the degree of “specification of roles, obligations, rights, procedures, information flows” (Kumar & van Dissel, 1996, p. 5). The higher the initial degree of definition of coordination factors, the better the original structure is in the association (Kumar et al., 1996). Chisholm (1989) establishes that roles and specific tasks are not defined by the components. Also, roles are defined on the basis of experience, and specific tasks are determined by negotiation. Additionally, the issues at hand determine the bargain process.

Conflict

All the aspects related to conflict in this work are taken from Isenhardt et al (2000). They identify nine different perspectives of conflict: attribution, equity, field, interactional, phase, psychological, social exchange, classic system, and transformational perspectives. Conflict is a complex phenomenon, in which many factors and circumstances are affected. A common element in a conflictive situation is disagreement about one of several of the following aspects: disagreement with regard to values, status, power, needs, goals, or the way partners may use their resources.

Attribution Perspective

Under this perspective, when people are involved in conflict, they normally assign favorable results to their activities and unfavorable results to the activities of their partners. Consequently, they consider their activities as cooperative and the others as uncooperative. Partners may utilize broad labels to explicate the misunderstood behaviors of their partners and ascribe culpability supported on detrimental personality traits that they identify in their partners. This type of attribution takes place frequently in the midst of emotional and stressful interactions, and where their positions are different. In order to reduce conflict, adversaries need to disclose misperceptions generated by inexact preconceptions. In other words, they need to uncover the preconceived beliefs that create obstacles to solve their problems. If they want to reduce the conflict, they need to identify their particular contributions to the intensification of their conflict, eliminate reproaches, and recognize liability for finding alternatives and solving their problems.

Equity Perspective

As people's perceptions and circumstances change, perceived advantages, costs, benefits, criteria and relationships change as well. When an inequity happens, several alternatives can be used to reestablish the equity. For example, identifying imbalanced interchanges and generating mechanisms that recompense the affected partner, apologizing for assigning unjustified blame, and negotiating and establishing rules that characterize what are balanced interchanges.

Field Perspective

People's environments, some of which stimulate or constrain their behaviors,

affect their behaviors. Conflict is a mismatch produced by environmental conditions, in which partners press in different directions, which produces tense conditions. Reducing conflict implies the recognition of the environmental forces that may influence negatively their interaction and find joint solutions.

Interactional Perspective

People interact according to their perceptions. At the same time, the interactions affect their perceptions. In an interaction, conflict, an inevitable phenomenon, consists in a series of negotiations where partners evaluate results and define their responsibilities, benefits, costs, rules, alternatives, and solutions. In a negotiation, an initial concession may provide the first step to build trust, an action that can affect partners' perceptions. In general, their perceptions may affect future actions that can benefit mutual understanding.

Phase Perspective

Conflict expands in a series of predictable stages. Scholars disagree about the number and the names of the stages in a conflict, but they coincide on characteristics of the conflict stages, actions that initiate it, and specific actions that contribute to maintain or increase it. Two different sequences of conflict phases have been identified. The first one contains the following stages: latent, initiation, and power balance, or disruption phases. And the second one includes: differentiation and integration.

Psychological Perspective

Unconscious states like fear or anxiety influence the partners' perceptions of their alternatives, and consequently, the assessment of their actions and stimuli. Some internal forces create internal pressures on individuals and such pressures need to be

liberated. Consequently, some individuals act in ways that may damage their relationships. In some cases, conflict can be reduced identifying the behaviors motivated by negative unconscious states that escalate the problems or the feelings that may not necessarily reflect the concrete situation.

Social Exchange Perspective

Conflict is a sequence of people's perception of low benefits, high costs, or huge obstacles that restrict the achievement of their objectives. Tactics, such as manipulation, aggression, forgiveness, coerciveness, and indifference affect the interchange of resources. Conflict can be reduced by identifying negative tactics that escalate the conflict, and identifying interests and needs for each partner in order to produce satisfactory interchanges.

Classic System Approach

There are three types of conflict from the point of view of this perspective, which make the system fail: homeostatic, subsystem, and over/under performing. Homeostatic conflict happens when partners maintain the same negative types of interaction without the introduction of any positive variation. In these circumstances, partners are unable to identify neither the causes of conflict nor the benefits of change. At times, conflict produces benefits for some of the partners and they are reluctant to reduce the negative effect of the conflict. Subsystem fail takes place when a subsystem fails and produces inefficiency in the whole system, which are the cause of conflict and the lack of cooperation that reduces the possibilities to achieve the objectives. Over-performing or under-performing partners arises when a partner goes beyond or fails to keep up with the original expectations of their responsibility. Sooner or later performance expectation

will be affected, and in the best case, a redefinition of equal interchange will be needed. In the worst case, a disruption of the relationship will occur. In this perspective, it is accepted that the initial detection of problems have more profound causes and are influenced by systematic relationships, where subsystems affect directly or indirectly all or almost all the subsystems.

Transformational Perspective

Conflict is a fundamental element of social interaction in which social stress is liberated and new collective rules are defined. Conflict generates new structures, behaviors, and solutions, and stimulates changes. In addition, conflict is the difference between today and the desired future, and compels us to work with more profound concerns to transform the social interaction. Changes take place when partners modify their perceptions about themselves and their associates, or transform their interaction.

Levels of Collaboration

The idea of levels of collaboration has been expressed in the literature in different ways: as cooptation, co-specialization, learning and internalization of new skills (Doz, 1996), as cooperation, coordination, and collaboration (Winer et al., 1994; Mattessich et al., 1992), as coalition and federation (D'Aunno et al., 1987), and as distributed, complementary, family, and integrative patterns (John-Steiner, 2000).

Levels of collaboration can be expressed in an analytical way, using three variables described in the previous section - trustworthiness, commitment, and competence - and two values, low and high. Mathematically, the number of levels can be expressed as (2^3) that gives 8 different levels. The three previous variables are intrinsic to the parties' behavior, which is a limitation. (see Table 2).

The first level, low trustworthiness, low commitment, and low competence, is exemplified by forming a line. When many people, usually strangers, arrive to the same cashier almost at the same time, they create a congestion problem. This congestion problem can be solved in different ways: using an electronic counter given tickets to users, negotiation with the people that are waiting, establishing some kind of priority rules, or forming a line. Forming a line is a convention that usually produces fair, and satisfactory but not optimal results. If most of the people waiting for service weaken the mechanism to solve the congestion problem the consequences will be wasting time, confusion and eventually chaos. When a line is formed, people in line do not trust the others, they trust the mechanism (Brown, 1995).

A caravan of vehicles in a highway represents the second level, low trustworthiness, low commitment, and high competence. Again, when many drivers are using the same highway in the same section, they create a congestion problem. However, every driver needs to demonstrate competence, drivers license, and satisfy some requirements: legal age, and not under the effects of alcohol and/or drugs. In a caravan, the speed is established around the speed limit, drivers keep a prudent distance with the precedent vehicle and adjust their speed to maintain inside the group. Some drivers, of course, establish their own speed limit (Brown, 1995).

Mass demonstrations and boycotts are examples of the third level, low trustworthiness, high commitment, and low competence. In a boycott, an undetermined group of individuals join in a common refusal to have transactions with a store or organization to show dissatisfaction or to oblige acceptance of specific conditions. In a mass demonstration, a large number of people display publicly, at the same time,

disapproval against something they would like to change or support for a specific cause. Either in a boycott or in a mass demonstration, a group of strangers manifest their common disapproval or support for a cause, but the level of commitment is different. An individual who participates in a mass demonstration may take more physical risk than the one participating in a boycott. In both situations, the organizers know each other, but not the majority of participants.

Table 2

Levels of Collaboration

Trustworthiness	Commitment	Competence	Examples of collaboration
Low	Low	Low	Form a line
Low	Low	High	Conventional speed of caravans in a highway
Low	High	Low	Mass Demonstrations Boycotts
High	Low	Low	Collusion
Low	High	High	Interchange of technical specifications
High	Low	High	Mutual interchange of services
High	High	Low	Development of a new service or product
High	High	High	Develop a new solution for a complex problem

The fourth level is exemplified by collusion. Collusion is a negative type of collaboration (Smith et al., 1995) in which a clandestine agreement has been created particularly for a dishonest or fraudulent purpose. Individuals working in certain positions possess privileged information and opportunities, which allow them to take advantage of others as long as their supervisor or peers either do not detect or do collude with them (Shapiro, 1987).

The fifth level is exemplified by interchange of goods. Some work agreements,

such as *Just in Time*, require that a profit organization and its providers form a chain of production. The organization leader reduces the number of providers and strengthens its relationships with them. Partners in the production chain should interchange information about demand, raw materials, transportation time, process, process time and quality. Their relationship extends beyond a simple economic exchange because they need to coordinate production, transportation, avoid inventory costs, and eliminate time rechecking quality of input materials in each stage.

The sixth level can be represented by an interchange of services. For example, an exchange between a university and a museum in which the university develops the museum's website and the museum allows students to have access to its collection. In this kind of situation, each institution has their own goals, they interchange services, but may not necessarily work on the same objective.

Development of a service or product is an example of the seventh level. In this instance, two organizations want to solve a problem in which the solution is known, but they do not know how. In order to achieve their common objective that they have never done, they need to demonstrate trustworthiness and commitment toward each other. Finally, the last level is exemplified by the development of a new solution for a complex problem in which organizations have specific skills, but each one by itself is unable to find a solution and the common problem is complex.

The previous brief analysis has several limitations. For example, it does not define the context in which collaboration is produced, and it does not consider the complexity of the common objectives, level of risk, and rate of change in the environment where the collaborative effort is operating. Additionally, trustworthiness,

commitment, and competence are not orthogonal.

Levels of Collaboration in inter-organizational relationships

Although a number of scholars have identified different levels of inter-organizational collaboration, there is not a classification. Three levels of collaboration are proposed in this work: exchange, cooperative, and collaborative.

Exchange of Resources and/or Services

Exchange was proposed as the lowest level of collaboration among organizations. The idea of exchange is based on Blau's ideas. The concept of pooled coordination of (Kumar et al., 1996) is extended in two ways. First, collaboration can have two mechanisms of coordination (Chisholm, 1989), formal and informal, and second, it needs to create and maintain a relationship (Blau, 1964).

The exchange can have two modalities: economic and social exchange, exchange of resources and/or services. Collaboration among organizations is not defined by economic exchange. According to Blau (1964), in an economic exchange the exact obligations of the parties are defined simultaneously. Commodities and money may trade at the time the exchange is achieved, or an agreement is prepared to specify parties' future obligations. In an exchange of resources and/or services that does not have price, the responsibilities acquired are not indicated previously, which creates future responsibilities, and reliance on trustworthiness. The possibility of satisfactory exchanges in the future, the reciprocity norm, and trustworthiness are the bases of their relationship (Blau, 1964).

In this type of inter-organizational collaboration, the lowest levels of trustworthiness, commitment, interdependence, and coordination are found. Partners

are competent in some areas linked to the common interest, but they may have different objectives and work separately.

Cooperative Level

In this level of collaboration, partners co-participate using work units, but all the members of each unit belong to the same organization. The levels of trustworthiness, commitment, interdependence, coordination, and competence are higher than in the exchange level; even their relationship is stronger. However, the organizations are relatively independent.

Collaborative Level

In this level, partners integrate work teams with members of different organization. Their relationship and the levels of trustworthiness, commitment, interdependence, coordination, and competence are higher than in the cooperative level. In the area they are collaborating they are totally interdependent, and they must integrate their activities in such areas. Of course, these levels of collaboration are affected by uncertainty, risk, and complexity.

Collaborative Process

Although, inter-organizational collaboration is perceived as a process, there are not many models. In this work, the models considered are related only to inter-organizational collaboration, and they are the Winer & Ray, D'Aunno & Zuckerman, Ring & Ven, and Doz models.

Winer et al. (1994) understand collaboration among non-profit organizations as a four stages process. Developing a common vision, the first stage requires inviting stakeholders to deepen trust among them, and to define a common vision and expected

results. Getting authority from the home organization to make decisions, the second one, involves defining the commitment of each participant, mechanisms for conflict resolution, organizational effort, and the decision-making protocol. Building relationships and working together, the third one, implicates to define tactic operations adjusting vision and results if it is necessary, to create collaborative systems for approving agreements and organizational changes in the home organization, and to define a common evaluation plan and change mechanisms. Providing continuity, the last one, includes creating visibility and promoting the collaborative results to involve the community, to change the system when it is needed, and to end the collaboration when the collaborative goals have been obtained (Winer et al., 1994).

Some of the advantages of the Winer & Ray model are the level of detail that the authors provide. The model is oriented to non-profit organizations, and some of the specific suggestions about documentation forms and worksheets are helpful. The Winer-Ray model follows a typical planning schema, which may focus on rational aspects of collaboration, but not mold circular relationships.

The life-cycle model of organizational federation in hospitals developed by D'Aunno & Zuckerman defines the collaborative process in four stages: emergence, transition, maturity, and critical crossroads. It was developed to represent a collaborative effort when the main goal is pooling scarce and valuable resources. This process goes through transition from informality to formality in which courses of action, organizational configurations, and activities in collaborative effort match the stages of development. A federation is a specific type of collaboration that has more than two partners and membership criteria, is managed by management group or organization,

and pools scarce resources avoiding dependency on unreliable providers (D'Aunno et al., 1987).

Ring and Ven provide an additional model in which they consider processes of collaborative inter-organizational relationships as “socially contrived mechanisms for collective action, which are continually shaped and restructured by actions and symbolic interpretations of the parties involved” (Ring & Ven, 1994, p. 96). The methods in which practitioners reach deals are: execute them, modify their conditions, and influence what they consider equitable and efficient. The interaction can have different types of connotations – positive, neutral, or negative – to the relationship, affecting the way practitioners resolve disagreements. Collaboration is a cyclical relationship with different stages: negotiations, commitments, executions, and assessment (Ring et al., 1994).

Doz developed a model of collaboration in which the main component is the learning process among partners. For him, the way in which business organizations collaborate has changed. At present, collaboration is frequently more close to the central activities of the organizations than it was in the past. Also, it confronts greater uncertainty, which increases with the number of partners and aspects they share. For example: resources, skills, knowledge, information and tumultuous environment. Furthermore, it approaches more complex problems and is more problematic to manage because of uncertainty and instability in the relationship (Doz et al., 1998).

Doz conceives collaboration as a learning process in which partners need to learn about the environment, tasks, process, skills, and goals. The process has three stages: learning, re-evaluation, and revised conditions. Collaboration, a cyclical process, starts from initial conditions in which partners have expectations. The initial

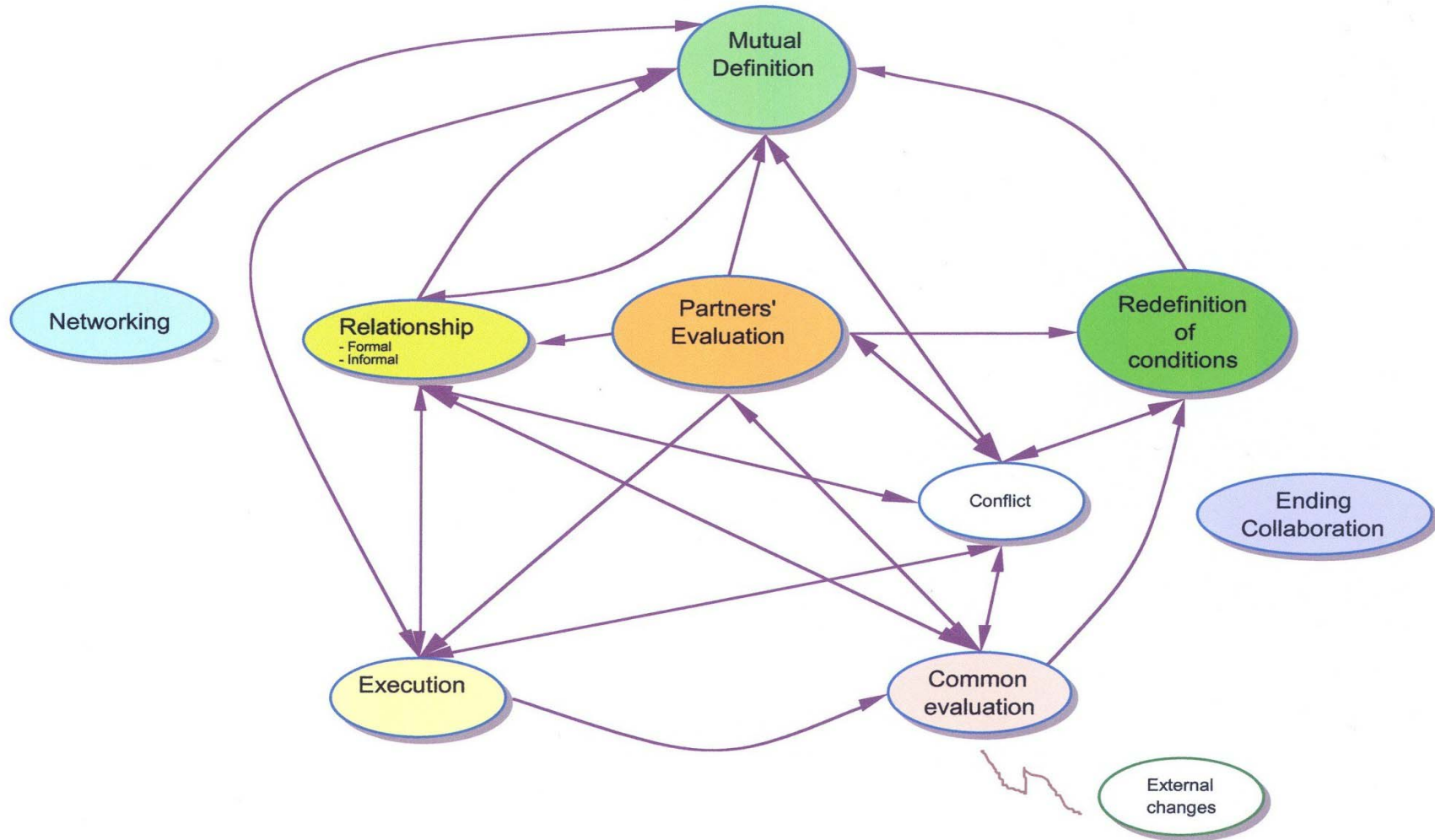
conditions facilitate or hamper the collaborative process. Successful collaborations between profit-organizations develop via a succession of cycles of learning-reevaluation-readjustment over time, in which the impact of initial conditions quickly vanish. Learning deficiencies, suppressed learning or negative readjustments are conditions that can contribute to unsuccessful collaborations. Initial collaborative conditions and interdependencies among partners can affect the shared learning process, either facilitating or obstructing the learning about common environment, goals, process, tasks, and skills. When initial conditions are allowed and the partners commence to work together they begin to learn. The learning process is the base for recurrent reevaluations and monitoring their collaborative effort conforming three evaluative criteria: efficiency, equity, and adaptability. As learning periods of rewarding collaboration are achieved, the commitment among them increases. Initially partners commit to each other with the expectation of being reciprocated, and as an opportunity to evaluate and increase trust (Doz, 1996).

The following model is essentially based on the Ring & Ven, Winer & Ray, D'Aunno & Zuckerman, and Doz models as well as the relationships between conflict and quality of the relationship suggested by Ariño and de la Torre (1998), Blau's ideas about fair exchange and social integrative process, Chisholm's informal coordination, and Isenhardt & Spangle's (2000) perspectives of conflict that they describe (see Figure. 4).

In order to start to describe the collaboration process, it is convenient to define interaction, a fundamental concept in collaborative relationships. Interaction has been studied in psychology as a consequence of conscious and unconscious motives, stimuli,

perception, cognition, and personal traits. In social sciences, they have been considered as effects of social roles, norms, values, social position, cultural prescriptions, group affiliation, and social pressures. Interaction in the social arena is a series of actions in which participants influence mutually.

Figure 4. Collaboration Process



Developing a dynamic understanding, each participant interprets, assigns and constantly modifies the meaning of her interactions. In this process, participants take actions based on their understanding of problems and their circumstances at the moment they make their decisions (Blumer, 1969).

Schelling (1978) analyzes how strangers interact using the multiple prisoners dilemma. One of the analysis conclusions is that personal behavior in a dynamic interaction with strangers depends on what the others do. The best alternative at any time is to do what most of the people are doing. What is considered the most popular alternative may change over the time, and consequently, in order to adapt, the participant's preferences will change when trying to choose the best option. For example, if most of the people attending a conference are sitting in the last rows of the room, the majority of the people who arrive late will be sitting in the back too, which will generate a behavior pattern. Double-parking, tipping-in and tipping-out are other instances of this phenomenon. In search of the best alternative, strangers generate group behavior. Of course, the previous conclusion applies when everyone knows what the others are doing (Schelling, 1978).

Interaction is a dynamic component that allows the emergence of new attributes in a relationship. Essentially, a relationship is the result of frequent interactions, and it cannot be understood solely as the synthesis of each participant's characteristics. The structure and characteristics of the relationship evolves over time because of the constant interaction. The expectations of obtaining benefit are the motivation to interact and to maintain the relationship through multiple exchanges in a relationship (Blau, 1964).

Westley and Vredenburg (1991) use the word *bridging* to define a type of collaboration in which an organization plays the role of an intermediary that bargains separately with each one of the stakeholders. In this case, it is used to name the first stage of collaboration where stakeholders meet and informally discover possibilities for working together in aspects of mutual interest. This stage finishes when formal negotiations start.

The negotiation stage is necessary for several reasons. First, stakeholders need to define why they want, how they are going to get it and how to share the cost and benefits. Second, neither of the stakeholders has the capacity to achieve the goals by itself. Third, no one of partners has authority, way to control or force the others. Fourth, the negotiation stage allows the parties to know more about each other. Fifth, members involved in this stage start to develop formal and informal relationships and play two roles, personal and performer. Negotiation finishes when partners get or do not get an agreement. If they get it, they will execute it or the collaborative attempt will finish.

In the execution stage, partners need to adapt their agreement to specific working and environmental conditions. The way they solve the operative problems can affect the relationship. Sometimes, unpredictable circumstances may require renegotiation. In this stage, partners are going to define tasks, schedule, identify task outputs, adopt mechanisms of coordination and evaluation, control structures, and execute the activities needed to achieve the collaborative goals when it is possible. Also, partners in the operative levels will generate informal procedures and routines to coordinate their activities.

While partners are bridging, negotiating agreements and executing tasks, they

are creating a relationship. Both formal and informal aspects are present in the relationship. The negotiation process, the execution of task, conflicts, environmental changes, and particular perspectives of each partner affect the relationship.

Environmental changes and conflict among partners may emerge and modify conditions defined in the common agreement. A common assessment of the new conditions may require a common assessment and the redefinition of conditions to continue working in the collaborative project.

Summary

In this Chapter, eight perspectives linked to collaboration are described, specifically, collaboration among egoists, collaboration among strangers, collaboration as an exchange of resources, skills, and services, collaboration from power perspective, collaboration as an informal system of coordination, collaboration as a creative solution, collaboration as a competitive advantage, and collaboration between non-profit organizations and governmental sector. Also, the determinants and consequences of collaboration are represented in a fish-bone diagram. Furthermore, the nine factors that affect the nature of collaboration are identified: trustworthiness, commitment, competence, uncertainty, risk, interdependence, coordination, complexity, and integration. Three levels of collaboration are proposed, exchange of resources and/or services, cooperation, and collaboration. Additionally, a model of collaboration is proposed based on Ring & Ven and Doz models. In Chapter 3 the assumptions, limitations, and methodology of this study are presented.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

The methodology used in this research was multiple case studies, essentially, exploratory. This research tried to understand what collaboration is, factors that affect the nature of collaboration, and the existence of relationships if any among those factors. In this work, there were three explicit questions: a) there are factors that affect collaboration; b) there are stages in the collaborative process; and c) what are the stages in the collaborative project. Some factors that affect the nature of collaboration according to the perception of the partners collaborating in the funded projects were investigated. Relationships that exist among the factors that may affect collaboration were identified if present.

Rationale

The collaborative processes are dynamic, multi-disciplinary and multi-dimensional. The variables that affect collaboration projects change over time. For example, the level of trustworthiness among the organizations initially may be low, but over time may increase (Doz & Hamel, 1998; Blau, 1964). However, other factors may reduce their value over time, such as uncertainty related to the partner or complexity linked to the common task. It is a multi-dimensional problem because many variables may explain the behavior. Different disciplines are concerned with the collaboration problem, such as social psychology, political sciences, economic sciences, sociology, management, and others. Also, different factors affect the process, allowing different levels of collaboration.

Different levels of collaboration in inter-organizational collaboration may exist:

exchange, cooperative, and collaborative. First, exchange happens when two independent entities exchange goods and when services of favors whose values are not defined by the market. This process of exchange creates a relationship in which entities create future obligations. Second, in the cooperation level, the degree of trustworthiness, interdependence, and commitment are higher than in the exchange level. Every partner executes activities for their own objectives or common goal independently, and the activities should be coordinated by common agreement. Third, in the collaborative level, the degree of trustworthiness, interdependence, and commitment are higher than in the cooperative level. Partners create inter-organizational work teams to achieve common goals. Also, they develop a relationship with a high level of integration in the common area in which they are working.

Assumptions

Although there are differences between profit and non-profit organizations, there are also similarities. The differences may be the level of risk acceptable, profit-expectation, type of environment in which they interact, needs for privacy and differences in their organizational cultures. However, both organizations should be effective enough to survive in their environment and provide products or service to their respective users.

Among other differences, profit organizations working in competitive environments, are more sensitive to take care of the aspects that provide them with competitive advantages, and their organizational cultures are more competitive. In the different levels of collaboration, not only do partners share values, vision, resources, and work, but they also work in the development of their relationship.

Partners collaborate because they have expectations to obtain something from the relationship. For example, to develop new skills, to attract new clients or users, to have access to restricted resources, and to achieve competitive advantages, etc. Those expectations include levels of acceptance of losses, expectations of fair exchange, and expectations about their relationship. Additionally, each partner by itself cannot obtain the desired result or it presents disadvantages for working alone. All collaborative projects have a beginning and end.

Although power asymmetries exist and may affect collaboration, it is considered small enough to allow collaboration in this type of funded projects and provides the partners *similar rights*. Therefore, power asymmetry was considered in this study.

Limitations

The levels of access granted the investigator by the organizations determined the major limitation of this study: The more information available for the investigation, the more robust the results. Sometimes potential participants in this type of project did not have time or willingness to disclose information. The perceptions of the people working on the collaborative project were studied, but not the concrete phenomenon. In addition, given the generality of this research, interpersonal aspects linked to communication, psychological, power and group dynamics were not considered.

Each factor studied and some of the stages by themselves represent a complete field of study, and this work is just a sample of a huge conceptual body. All of these factors and stages must be studied in detail. The justification for using these concepts without bringing the entire field is the need to have a holistic perspective from the collaborative phenomenon.

The results of this study are not generalized to the entire set of non-profit organizations, or even to the population of collaborative granted projects. In the cluster analysis, clusters that are together may or may not be important in the negative because of the response bias of negative factor. In addition, given the size of the sample the covariance could be unstable, and some of the indicators must be considered as preliminary.

Research Questions

The study propositions involved:

1. What are the factors that affect the nature of collaboration according to the perception of the partners collaborating in the funded projects?
2. Are there relationships among the factors that may affect collaboration?
3. What are the stages in the collaborative process?

Operationalization of Variables

Variables derived from the literature review are defined operatively in this section. They are: trustworthiness, commitment, competence, uncertainty, risk, interdependence, coordination, complexity, integration, expectations, and conflict. Trustworthiness has been defined as competence (Nock, 1993; Govier, 1997), openness, supportiveness, which is the ability to explore differences constructively - acceptance, tolerance for disagreement, and constructive use of people's openness - (Zand, 1997), prediction of behavior, surveillance (Nock, 1993), fair reward system/*norm of reciprocity* (Chisholm, 1989), and expectation of benevolent and harmless behavior (Govier, 1997). In this research, trustworthiness is characterized as reciprocity, reliability, and competence.

Given its importance, competence is used as a different variable. Competence is a concept used in communication and is operationalized as adaptability, knowledge, responsiveness, assertiveness, and versatility (Wheeless & Lashbrook, 1987; Merrill & et al., 1981). An individual is considered as competent when they own significant knowledge, skills, and aptitudes to carry out a specific work (Barge, 1994).

Interdependence is typified as dependency on partner's skills, knowledge, resources, work (Thompson, 1967), and the level of coordination (Meyer, 1993). Complexity is described as impact of technology, and level of difficulty of the collaborative project.

Commitment is expressed as importance of the collaborative goals with respect to the organizational goals, top management support or staff support and availability of resources (see Table 3). Morrow (1993) gives some characteristics of commitment: Self-regulation, tenure, job satisfaction, organization climate, level of stress, role overload, resource inadequacy, hours worked, formalization, routinization, formalization, and role ambiguity. Cook and Wall (1986) perceive commitment as identification, involvement, and loyalty to the organization. Mowday and Steers (1986) view commitment as the affinity with organizational goals, and the inclination to maintain membership in order to achieve those goals.

Table 3

Variables and factors

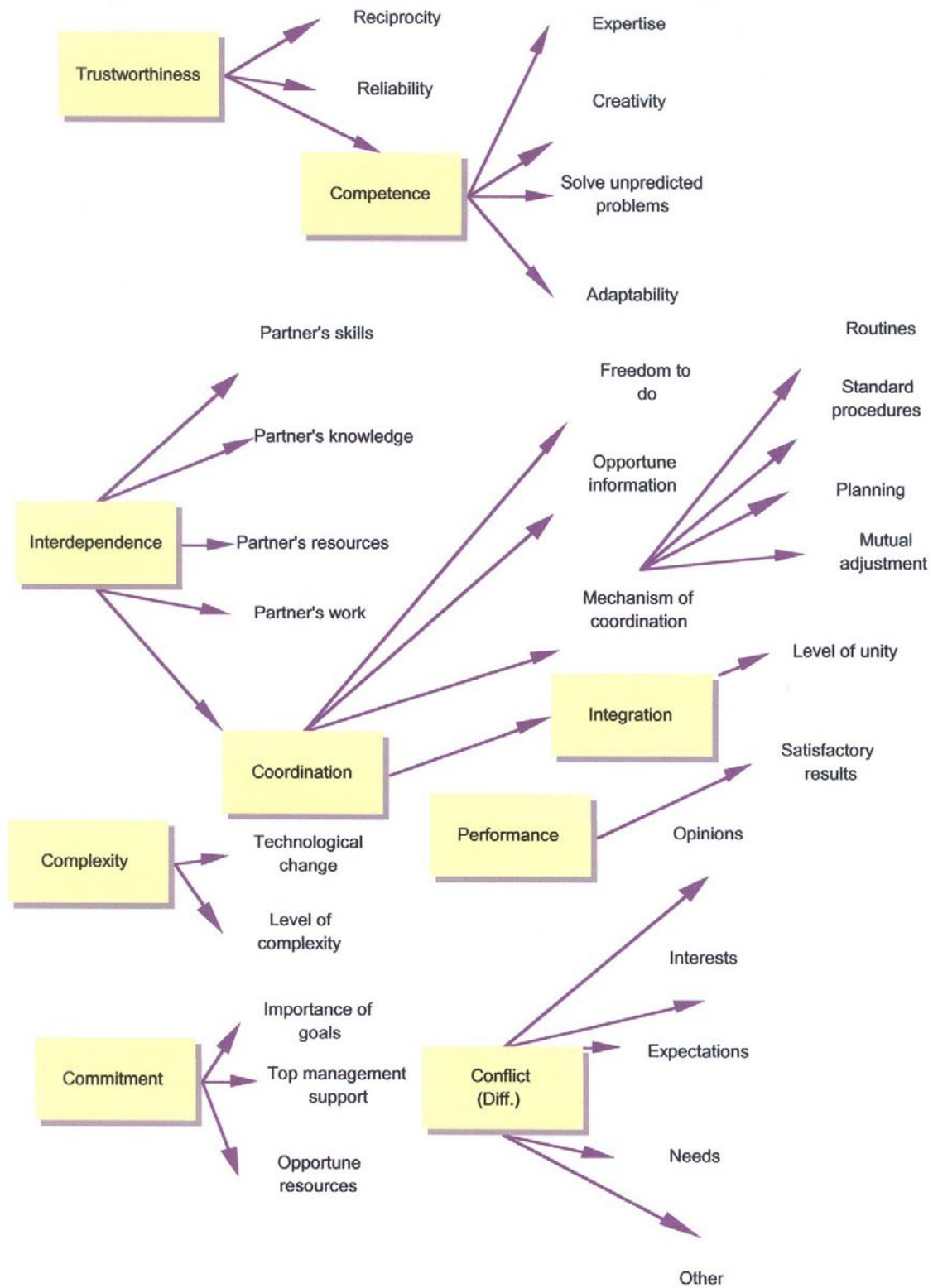
Construct	Variable	Characterized by:
+ Trustworthiness	- Level of reciprocity - Partner's reliability	* low-high reciprocity * low-high reliability
+ Interdependence	- Dependency on partner's skills - Dependency on partner's knowledge - Dependency on partner's resources - Dependency on partner's work	* low-high dependency * low-high dependency * low-high dependency * low-high dependency
+ Complexity	- Impact of technology - Level of difficulty of the collaborative project	* low-high impact * low-high level difficulty
+ Integration	- Level of integration	* low-high level integration
+ Commitment	- Importance of the collaborative goals respect to the organizational goals - Level of support - Availability of resources by the partner	* low-high match * low-high support * low-high timeliness
+ Performance	- Matching between project results and original expectations	* low-high match

Table 3 continues

Table 3 continued.

Construct	Variable	Characterized by:
+ Coordination	- Difficulty to obtain information	* low-high difficulty
	- Freedom to do new things	* low-high freedom
	- Use of routines	* infrequently-frequently
	- Use of standards	* infrequently-frequently
	- Use of planning mechanisms	* infrequently-frequently
	- Use of mutual agreements	* infrequently-frequently
	- Use of other mechanisms	* infrequently-frequently
	+ Conflict	- Differences of opinions
- Differences of expectations		* low-high impact
- Differences of needs		* low-high impact
- Differences of interests		* low-high impact
- Other challenges		* low-high impact
+ Competence	- Level of expertise	* low-high
	- Level of creativity	* low-high
	- Solve unpredicted problems	* low-high ability
	- Maintenance of the relationship	* poor-good
	- Level of adaptability	* low-high

Figure 5. Operationalization of variables



Performance is characterized as the comparison between the results obtained and the original expectations. Coordination is typified negatively as the difficulty of obtaining information, integration, freedom to do new things, and the use of mechanisms of coordination (Thompson, 1967). Conflict is described as the impact of differences, opinions, interest, expectations, needs, and other issues on performance (Isenhardt et al., 2000). Finally, competence is characterized as level of expertise, creativity, and adaptability of the partner, and its capacity to maintain the relationship (See Table 3 and Figure 5).

Pilot Study

Before the pilot study was carried out, the instruments, a questionnaire and a semi-structured interview script, were revised by a group of twenty graduate students for grammar and style. The pilot study was undertaken in a collaborative project funded by IMLS between the Dallas Museum of Art (DMA) and the School of Library and Information Sciences (SLIS) at the University of North Texas (UNT).

During proposal defense, the committee suggested the addition of a set of questions related to factors that may affect collaboration and the significance of these factors in a collaborative project. The instruments were adjusted: by assessing the wording and styles of the questions which helped to develop and clarify the instruments where needed.

In the pilot study, the respondents were asked their opinions about whether they understood the questions and what modifications they recommended. Suggestions were included making some of the questions more specific and underlining the relevant aspects. Some respondents were not sure where to mark on the scale. Consequently,

the scale was changed from sliding to numeric to avoid confusion.

The order of questions was changed and some of them were grouped categorically in order to facilitate the sequence of questions. In general, the pilot test helped to identify the best order in which to collect data and to redefine data collection plans and procedures.

Population

The population of this study is a subset of collaborative projects federally funded by the IMLS. IMLS is an independent federal agency that fosters innovation, and lifetime learning. It supports collaborative efforts among all type of museums, libraries, and universities. IMLS funds collaborative projects for libraries and museums to enhance their unique resources and ensure broad community access through technology, to ensure equity of access and to help bring resources to underserved audiences. Also, IMLS grants help strengthen operations, improve care of collections, increase professional development and enhance community service.

There were two criteria used to select the cases: (a) accessibility, and (b) funded partnership by IMLS. Final data collected for this study include 25 cases.

Sampling and Sample Characteristics

The method of snowball sampling, also called chain referral and referential sampling, was used in this study to find members of organizations that have collaborative projects funded by IMLS. Krathwohl (1997) points out “snowball sampling is used to discover the members of a group of individuals not otherwise easily identified by starting with someone in the know and asking for referrals to other knowledgeable individuals” (p. 173).

IMLS provided information about the projects they had granted in its website, but it was not easy to find the email address of the participants in the collaborative projects. In the best cases, only the names of one or two participants were found, but even this was not common. The major advisor of the researcher requested from the IMLS staff a list of participants in granted collaborative projects; the researcher received the list with 43 collaborative projects that included the project directors' contact information. The information of two other collaborative projects came from another conference that IMLS sponsored, the 21st Century Learner Conference, which made up a total of 45 collaborative projects granted by IMLS.

Having that information, the researcher invited all the project directors of collaborative projects granted by IMLS at that moment, and asked them to contact people participating in their collaborative projects. With this system of snowball sampling, the author eventually obtained email addresses of 144 participants in collaborative projects granted by IMLS.

From the 144 email contacts conducted, the following happened:

- a) nine email addresses were returned because the address was wrong,
- b) sixty-five people did not answer at all,
- c) five said that they probably would participate, but they did not,
- d) two said that they were just initiating their project,
- e) two were not involved in the project,
- f) two did not have time to participate,
- g) two were not working on the project any more,
- h) one was new to the project,

- i) one said that her project was not collaborative,
- j) one person who tried to contact the researcher by phone never answered the emails, and the researcher could not retrieve her by phone.

Eliminating the people whose email addresses were wrong, the people who were not involved, the people who were not working in the projects, the people who were initiating their project, and the person who is new in the project, there were 128 potential participants. This number probably was larger than the number of people who actually had participated in collaborative projects, as the researcher might not have had the correct contact information at the beginning of this recruiting process.

Eventually, 54 participants took part in this study. From those, 50 answered the questionnaire, and 38 were interviewed. Considering that there were 128 possible participants, the rate of return for the total number of participants was 39% for the questionnaires, and 29.68% for the interviews. Table 4 shows the composition of participants and their roles in their projects. Table 5 shows the composition of participants and the status of their projects.

Table 4

Participants Roles in Their Projects

Roles	Percentage of the Participants
Project Director	26%
Project Coordinator	42%
Others	32%
Total	100%

Table 5

Participants and the Status of Their Projects

Status of the Project	Percentage of the Participants
Finished	54%
Finishing	18%
More than half	6%
Middle or less	20%
Starting	2%
Total	100%

Instrument

A self-administered questionnaire and semi-structured interview script created based on the literature review and the amalgamation of concepts were used in data collection. The questionnaire focused on the following issues: trustworthiness, competence, interdependence, coordination, commitment, complexity, and conflict. Appendices A and H include the questionnaire and the interview script.

Method

Multiple cases were studied, using an online questionnaire and interview script to gather data for this study. To increase content validity, the study questions were developed based on the literature review, particularly on previous studies that used similar constructs. This study is exploratory; consequently, causality is not one of the goals of this research.

External validity established whether or not the sphere in which the research results could be extrapolated, and it was an obstacle for this research. The primary goal of this research was to obtain understanding and valuable insight related to inter-organizational collaboration and factors that may affect the nature of collaboration. Given the restrictions for this research, sampling, and the nature of the problem,

external validity was difficult to claim. Finally, internal consistency was calculated for each one of the operationalized concepts.

Data Collection Procedure

For the protection of human subjects, the researcher applied for and received approval for this study from the Institutional Review Board (IRB) at UNT before conducting this study. The researcher sent emails to the participants with information about the purpose of the study and the address of the Website that contained the questionnaire designed for this study.

An online consent form was first displayed when a participant accessed the web site. Before answering the questionnaire, participants had to give their consent by clicking the agree button on the online consent form. In addition to answering the research-related questions, participants were also asked to give their names and organizations in the questionnaire, for controlling the data source. Finally, the answers to the questionnaire were sent to the researcher's personal email address.

Thirty-eight participants accepted to be interviewed. The telephone interviews were taped using a Sony® TCM-20DV cassette-recorder³, and were also digitally recorded using a Sony® IC Recorder ICD-MS1⁴ with a 64 megabyte (MB) memory stick. The author conducted all the interviews, and the recorded interviews were transcribed for analysis.

One of the participants asked for mailed questionnaire, and another refused to allow the interview to be recorded. The longest interview lasted 48 minutes, the shortest one 11 minutes. The average interview duration was 28 minutes with a standard

³ ©2002 Sony Electronics e-Solutions Company LLC. All rights reserved.

⁴ ©2002 Sony Electronics e-Solutions Company LLC. All rights reserved.

deviation of eight minutes and 31 seconds. The lengths of time mentioned did not include asking for permission to record the conversation, and the introduction in which the researcher explained the nature of the research and the time needed.

When an interview was about to reach the pre-agreed length of time (20 minutes), 94.73 % of the time the researcher asked the interviewee if they wanted to continue or stop the interview. One hundred percent of the interviewees decided to continue the interview, but only 25 participants answered all of the questions.

Invitations to participate in this research were done from February 7 to March 6, 2002. The first questionnaire was filled out on February 8, and the last on May 20. Four and a half percent of the questions from the interviews were not answered, and from the questionnaire questions, 1.3% of them were not answered.

Data Analysis Procedure

The questionnaire answers were analyzed using cluster analysis, multidimensional scaling (MDS), and for some variables, unidimensional maps.

Cluster Analysis

Cluster analysis is a name given to a set of noninferential statistics procedures allowing one to group empirical data based on similarity measures. According to Aldenderfer & Blashfield (1984), "a clustering method is a multivariate statistical procedure that starts with a data set containing information about a sample of entities and attempts to reorganize these entities into relatively homogeneous groups" (p.7). In other words, these techniques can produce classes from raw data. (Everitt, 1980).

Aldenderfer et al., 1984; Everitt, 1980 state that clustering methods have been used for six main reasons:

- 1) To unfold a true taxonomy or typology,
- 2) To explore conceptual relationships by grouping entities,
- 3) To generate hypothesis by data exploration,
- 4) To try to determine if relationships established by other methods are present in a set of data, or to test hypothesis,
- 5) To identify if a model fits an event, and
- 6) To reduce raw data to sets of classes.

In this research, cluster analysis was used to identify how well the operationalization of variables were defined in Chapter 2, used to define the questionnaire and matched the perceptions of sample of the participants in the granted collaborative projects by IMLS.

The process for doing cluster analysis is the following:

- a) definition of the sample, snowball sampling was used in this case,
- b) definition of set of variables, which was done in the literature review,
- c) definition of the measures of similarity, and the calculation of similarities among the variables. In this research, the similarity measures are the Euclidian distances among variables,
- d) definition of a cluster analysis method, the Ward's method, a hierarchical clustering technique was used and later in this document is the justification for that selection, and
- e) analysis of the solution (Aldenderfer et al., 1984).

In hierarchical clustering techniques, initially data are divided into a small number of generic groups, each group is subdivided into smaller groups, and the process of

subdivision continues until the final groups are founded. This procedure is called divisive method. Another method of hierarchical clustering blends successive entities into groups, which is called agglomerative (Everitt, 1980).

The Ward's method is an agglomerative clustering technique intended to find "the minimum variance within clusters" (Aldenderfer et al., 1984, p. 43). This method agglomerates entities or clusters into groups when their sum of squares is minimal. As a result of the grouping entities or clusters, in every stage of the clustering process, there is a loss of information, which can be measured as the total sum of squares of every point to the mean of its cluster (Everitt, 1980). In addition, in every stage the sum of squares is computed for each pair of entities or clusters, the fusion of each pair is taken into account, and the pair with the minimal increment in the sum of squares is blended (Everitt, 1980; Dunn-Rankin, Knezek, Wallace, & Zhang, 2002).

MDS

Multidimensional Scaling (MDS) is a set of noninferential statistical scaling procedures that allow discovering hidden patterns in empirical data (Kruskal & Wish, 1978; Shepard, Rommey & Nerlove, 1972). Furthermore, MDS attempts to represent in n -dimension space similarities between entities by mapping the distance between them. Distance between entities represents a measure of similarity (Coxon, 1982; Dunn-Rankin et al., 2002).

According to Dunn-Rankin et al. (2002) the process for doing MDS is the following.

- a) given a set of (m) entities, calculate the matrix of proximity. In this case, Euclidian distance was used,

- b) a number of dimensions (n) were chosen. The m entities are placed in the n -dimension space,
- c) MDS represents the proximities $f(\delta_{ij})$ between the pair of entities in the n -dimension chosen attempting to maintain the original distances (d_{ij}),
- d) the objective of MDS is to minimize the difference between $f(\delta_{ij})$ and (d_{ij}). In other words, when $f(\delta_{ij}) = (d_{ij})$ (equation 3.1), the algorithm is representing perfectly the original data in the n -dimension space, which can be represented $f(\delta_{ij})-(d_{ij})=0$. MDS uses the following formula to calculate the goodness-of-fit: $(\sum \sum [f(\delta_{ij})-(d_{ij})]^2 / \text{scale factor})^{1/2}$, known as Stress. The closer to zero the stress is, the better the goodness of fit (Kruskal et al., 1978; Borg & Lingoes, 1987).
- e) The method approaches the solution in successive approximations. Adjusting the positions of the entities in the n -dimension space, the algorithm can calculate different stresses. The best stress can be found using the least square regression, but computational procedures use what is known as “the method of steepest descent” (Kruskal et al., 1978, p. 27).
- f) The number of dimensions affects the stress value. The higher the number of dimensions, the lower the minimum value of stress will be. However, some problems are associated with the number of dimension: a) more than three dimensions is not possible to visualize, b) the solution could degenerate or come trivial, “the points of the configuration are strongly clumped” (Kruskal et al., 1978, p. 29), and c) given m entities, and n dimension, there is a rule of thumb: if $m > 4n$ the stress is not sensitive to m and n (Kruskal et al., 1978).

Unidimensional Map

Unidimensional maps represent a set of variables in a linear scale. In order to define the value of a variable in the linear scale, the next process is followed (Dunn-Rankin et al., 2002):

- a) The maximum value of the scale is found by multiplying the maximum that the variable can get by the number of participants. In this case, the maximum value of any variable is seven, and the number of participants is 50. Therefore, the maximum value of the scales is 350.
- b) The value of a specific variable in the linear scale is calculated by adding all the values assigned to the variable by the participants, and then dividing the result by the maximum value of the scale (350 in this case), and the quotient is multiplied by 100.

Interviews Analysis

Given the number of interviewees per project, it was decided to use the interviews answers to give context and focus on the collaborative process. The 38 participants interviewed came from 22 different projects, and they were interviewed just once. The mean of interviews per project was 1.72 with a standard deviation of 1.008. Projects in which the researcher interviewed two or more participants were 10. In those 10 projects, it was possible to make some triangulations of information. Consequently, no definite conclusions could be claimed given the heterogeneity of the projects and the complexity of the collaborative problem. However, great insight were acquired that will be helpful in future research, and the researcher speculates some possibilities in Chapter 5.

The most frequent concepts used by the interviewees were identified (see Appendix J), and the analysis focused on stages of the collaborative process and factors affecting this process. Projects were analyzed by type - exhibition, program, or digitization. Similarities, differences, and possible relationships were identified. In order to facilitate the analysis two databases were used, one for the answers of each question, and the other one for most frequent concepts used by the interviewees. The database software used was Microsoft® Access 2000⁵, which allowed for diversity of reports that could combine answers and concepts.

Summary

This research employed multiple cases. Fifty-four participants were recruited from people who participated in IMLS funded collaborative projects using snowball sampling; Online questionnaire were answered by 50 participants, and telephone interviews were answered by 38 participants to collect data. Other descriptive statistics such as percentages, means, etc. were used to summarize data from the questionnaire items. The variables utilized to understand the nature of collaboration were listed as trustworthiness, commitment, competence, interdependence, coordination, complexity, integration, and conflict. Cluster analysis and MDS methods were used for data analysis to identify the factors that affect the natural of collaboration and to investigate relationships among those factors.

⁵ © 2003 Microsoft Corporation. All rights reserved.

CHAPTER 4

RESULTS AND DISCUSSION

In this Chapter, the responses of 50 participants were analyzed using three methods: cluster analysis, multidimensional scaling, and unidimensional maps. In addition, the internal consistency of the concepts operationalized in the previous Chapter was computed, and descriptive statistics were used to give support to the analysis.

First, cluster analysis allows finding relationships among the variables, and offers the opportunity to see the relationships graphically. Second, multidimensional scaling provides a map of concepts, particularly in this case, a map of factors involved in collaboration. Third, unidimensional maps represent variables in a single straight line, which allows comparing them directly. Fourth, internal consistency permits a look at how well different variables measure the same issue. In addition, the descriptive statistics, used at the beginning of the analysis, give a general understanding of stages in the collaborative project.

Stages in The Collaborative Process

Eight different stages were derived from the reviews of studies, theories and ideas of the following authors: Winer & Ray (1994), D'Aunno & Zuckerman (1987), Ring & Ven (1994), Doz (1996) Chisholm (1989), Blau (1964), Isenhardt & Spangle (2000), and Ariño & de la Torre (1998). The participants were asked if the eight stages described were present in their collaborative projects. Appendix A shows how the different stages were defined in this study.

Figure 6. Number of Stages Selected by Participants

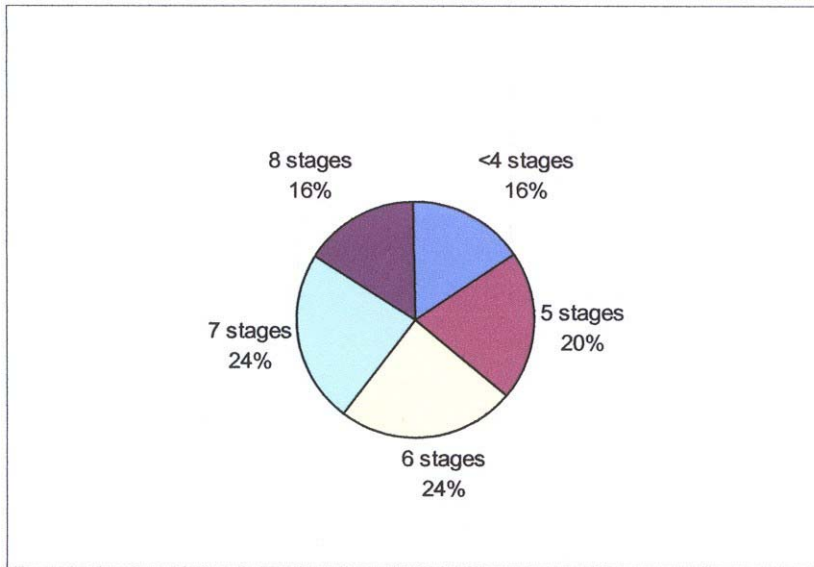
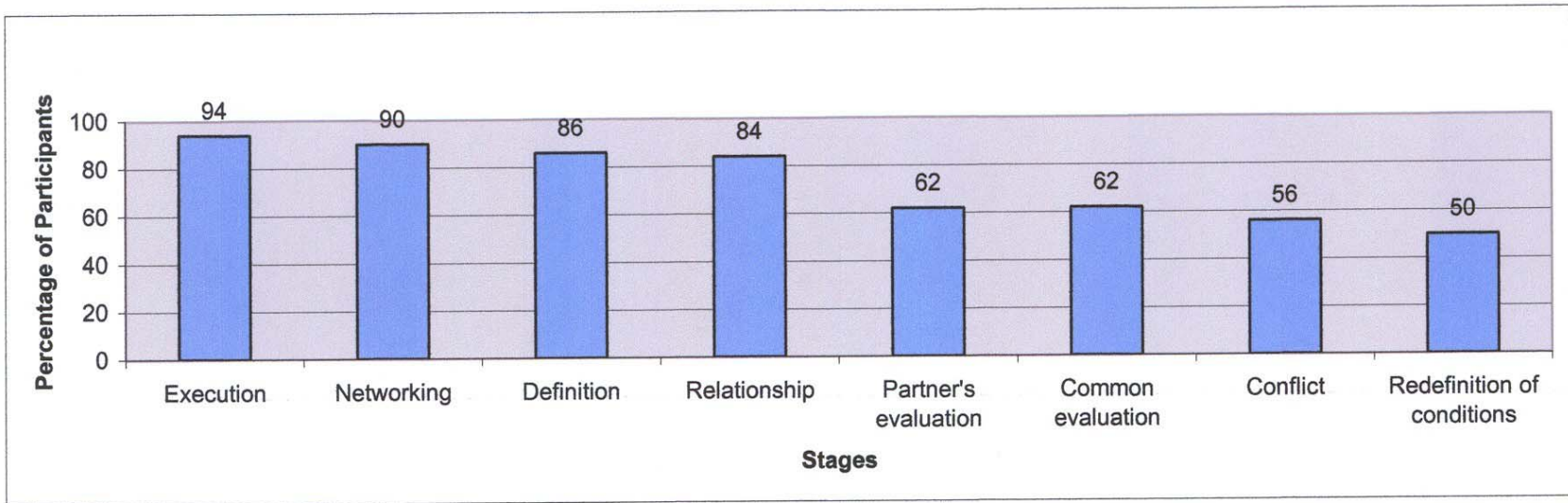


Figure 6 showed that 84% of the participants identified at least five of the collaborative stages. The top four most frequent reported stages are execution, networking, definition, and relationship. This is a relatively positive result due to the fact that just around 44% of all the projects were considered finished, and 20% of them were close to finished at the time the information was collected. In terms of participants, 54% of them worked in projects that were considered finished and 18% in projects close to being finished.

Figure 7 shows the stages ordered by frequency. The first interesting finding is that the definition stage is reported slightly less frequently than execution; the difference is eight percent. In the definition stage, partners developed a joint vision: objectives and agreements, identified alternatives, costs, and infrastructure needed, and defined rules and obligations for future actions by negotiation.

Figure 7. Order of Stages by Frequency



The common evaluation stage was defined as a procedure in which partners defined the progress of the collaborative project, and this procedure does not necessarily need to happen at the end of the project. Thus, it was expected that close to 100% of the participants would have reported this stage. As mentioned before, 54% of the participants had finished the projects and 18% were finishing when this study was conducted; however, 62% of the participants reported the common evaluation stage. Therefore, the number of participants who reported the evaluation stage is reasonable only if the participants conducted evaluations at the end of their projects.

Another notable issue in figure 7 is that only 50% of the respondents identified the *redefinition of conditions* stage. Initially, this result does not look consistent, given the nature of the collaborative process. However, this can be explained by the characteristics of the sample. Forty-six percent of the participants participated in collaborative projects with objectives to develop Websites and/or some kind of digitization process. The rest of the participants, 54%, participated in projects related with conservation, exhibitions, services, and special programs for literacy.

Cluster Analysis with all the Variables

Cluster analysis was used to determine if the operationalization of variables defined in Chapter three matches the perceptions the participants in the IMLS granted collaborative projects.

Using SPSS™⁶ 10.0 for Windows®⁷, a cluster analysis, employing Ward's method

⁶ Copyright © 2003, SPSS Inc. All rights reserved

⁷ © 2003 Microsoft Corporation. All Rights Reserved

(Aldenderfer et al., 1984), was performed using the 39 variables. The objective of this analysis was to compare if the operationalization of variables matched the perception that participants have about these variables. In this particular analysis, the exact number of clusters was not considered relevant, rather the way in which the variables clustered was the important characteristic (See Figure 8). Appendix D shows details about the sequence in which the variables are clustered.

Table 8 has four columns, the first one lists the concept, the second defines how the concepts were operationalized, the third shows the question, and the final column shows the cluster in the dendrogram or hierarchical tree. This table does not include the questions related to the significance of the variables, and some variables have a cluster number followed by dot or, which means that variable is an *orphan* in that cluster.

Figure 5 shows a visual representation of the operationalization of variables.

The dendrogram subdivided into two primary clusters. In the upper part, the variables that traditionally have been considered as positive are clustered, and the lower part, the negative variables. Cluster 1 includes six variables: partner's creativity to solve problems (R14B), partner's ability to solve unpredicted problems (R14C), level of reciprocity (R14F), level of reliability (R14G), partner's ability to maintain inter-organizational relationships (R14D), and level of adaptability (R14E). This group matches the original proposal because all of these variables operationalize the concept of trustworthiness, except the variable about partner's expertise (R14A).

Figure 8. Cluster Analysis 1

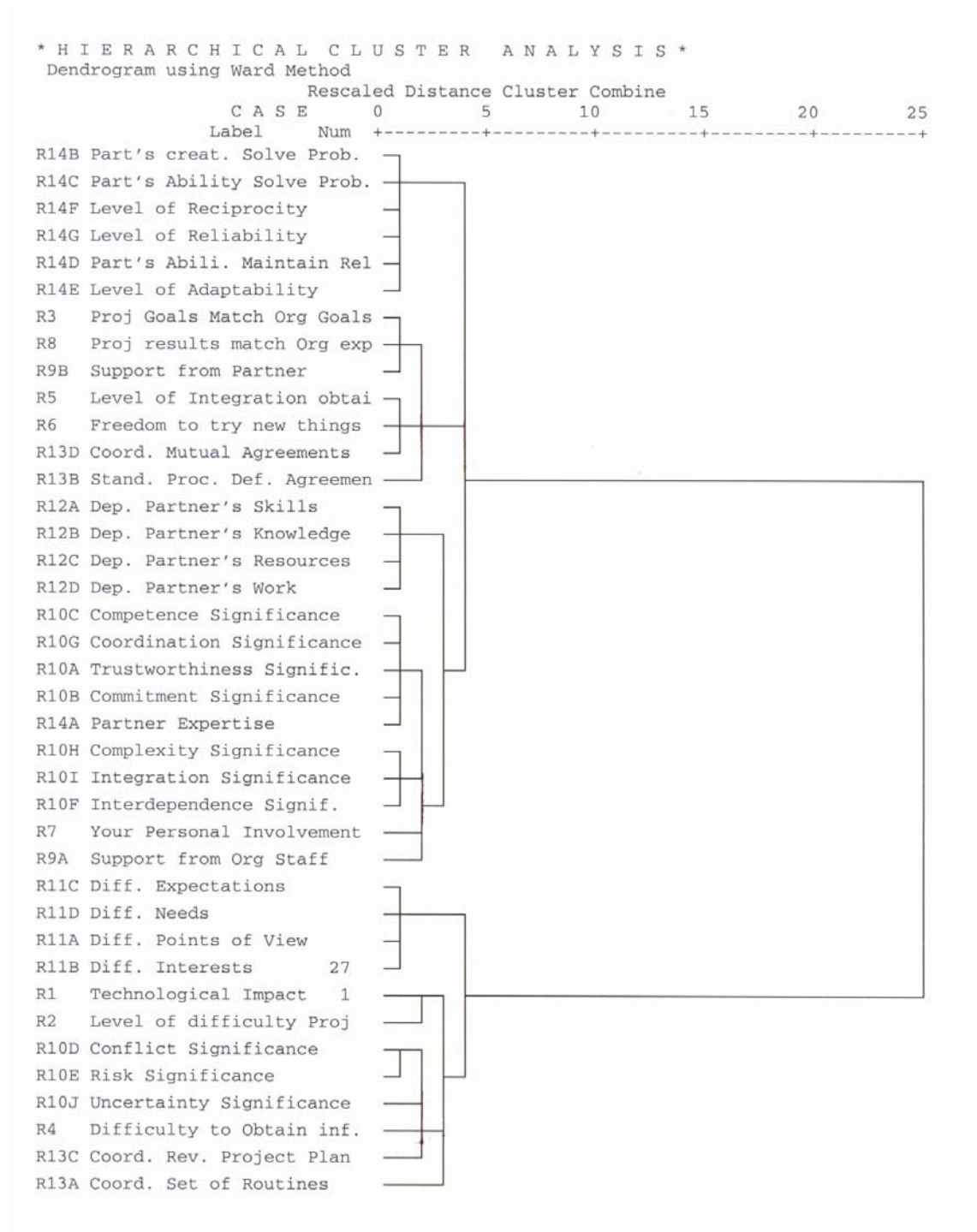


Table 6

Concepts in Cluster Analysis 1

Concept	Operationalization	Question	Group
Trustworthiness	Reciprocity	R14F Level of Reciprocity	1
	Reliability	R14G Level of Reliability	1
	Competence		
Competence	Expertise	R14A Partner Expertise	3.2
	Creativity	R14B Partner's creativity to Solve Problems	1
	Solve unpredicted problems	R14C Partner's ability to solve unpredicted Problems	1
	Adaptability	R14E Level of adaptability	1
	*	R14D Partner's Ability to maintain inter-organizational relationships	1
Interdependence	Partner's skills	R12A Dependency on Partner's Skills	3.1
	Partner's knowledge	R12B Dependency on Partner's Knowledge	3.1
	Partner's resources	R12C Dependency on Partner's Resources	3.1
	Partner's work	R12D Dependency on Partner's Work	3.1
	Coordination		
Coordination	Freedom to do	R6 Freedom to try new things	2.2
	Opportune information	R4 Difficulty to Obtain information	7
Coordination	Mechanism of Coordination		
	Integration		
Mechanism of Coordination	Routines	R13A Coordination by a set of Routines	7

Table 6 continues

Table 6 continued.

Concept	Operationalization	Question	Group
	Standard procedures	R13B Standard Procedures Defined by Agreement	2 (orphan)
	Planning	R13C Coordination by Revising the Plan	7
	Mutual adjustment	R13D Coordination by Mutual Agreements	2.2
Integration	Level of unity	R5 Level of Integration achieved	2.2
Complexity	Technological Change	R1 Technological Impact in the project	5
	Level of complexity	R2 Level of difficulty in the Project	5
Performance	Satisfactory results	R8 Project results match Organizational expectations	2.1
Commitment	Importance of goals	R3 Project Goals Match Org. Goals	2.1
	Top management support		
	Opportune resources		Interview
	Partner's commitment	R9B Support from Partner	2.1
	*	R7 Your Personal Involvement	3(orphan#1)
	*	R9A Support from own Org. Staff	3(orphan#2)
Conflict	Diff. Opinions	R11A Diff. Points of View	4
	Diff. Interests	R11B Diff. Interests	4
	Diff. Expectations	R11C Diff. Expectations	4
	Diff. Needs	R11D Diff. Needs	4

Cluster 2.1 includes the following variables: project results match organizational expectations (R8), project goals match organizational goals (R3), support from partner (R9B). It seemed that in order to get the expected results in the collaborative process, the collaborative project requires the commitment of both partners. The commitment of

one organization is assured when the project goals benefit the organizational goals. The other two variables related with commitment, personal involvement (R7) and support from its own organizational staff (R9A) are not grouped into this cluster.

Cluster 2.2 is an interesting surprise, which was not expected as a part of these results, and this cluster incorporates the subsequent variables: level of integration achieved (R5), freedom to try new things (R6), and coordination by mutual agreements (R13D). This result may suggest that the more coordination achieved among partners, the more integrated were the partners. This relationship was predicted in the operationalization of variables, but it was not known what mechanism of coordination or combination of them would fit these types of projects better.

Clusters 2.1 and 2.2 and the variable coordination using standard procedures defined by agreement (R13B) are part of the cluster II, which includes the expected results (R8), variables related to commitment, integration, and coordination. In other words, there are similar components in the participants' perception of these concepts.

Cluster 3.1 integrates the next variables: dependency on partner's skills (R12A), dependency on partner's knowledge (R12B), dependency on partner's resources (R12C), and dependency on partner's work (R12D). All of these variables operationalize the concept of interdependence. The literature defines that a requirement of dependency is trustworthiness, but in the dendrogram that relationship is not apparent.

Clusters 3.2 (R10C, R10G, R10A, R10B) and 3.3 (R10H, R10I, R10F) put together variables related to the significance of the factors that traditionally has been associated to benefit collaborative efforts, two commitment variables (R7, R9A), and one related to competence (R14A). This cluster, however, does not provide much

information. Probably, there is some relationship among those variables, but the relationship is not obvious. The expected result was that the *significance variables* (e.g. R10A) and their respective concepts to be associated with or closely related to each other. In this situation, it looks as if the variables measuring the significance concepts were divided in two: variables that benefit the collaborative effort, and those that do not (R10D, R10E, R10J).

Possible causes of conflict and misunderstanding are clustered in the lower part of the dendrogram, so are the variables related with complexity. Two variables that were not expected to be associated with negative factors are the coordination mechanism by revising the plan (R13C), and coordination mechanism by a set of routines (R13A).

The internal consistency reliability of some of the relationships found in the dendrogram is tested in this part of the analysis. The internal consistency for variables in cluster 1, commitment, mechanism of coordination, and the variables that measure significance of the concepts was performed using SPSS™ v.10 for Windows®.

Table 7

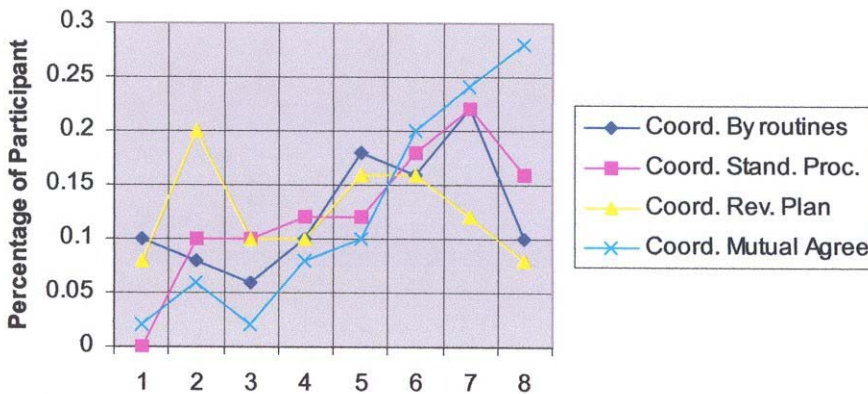
Alpha Values of Variables in Cluster Analysis 1

Set of variables	Variables	Alpha
Cluster I	R14B, R14C, R14D, R14E, R14F, R14G	0.9339
Commitment	R3, R9A, R9B, R7	0.4008
Mechanism of coordination	R13A, R13B, R13C, R14D	0.4779
Significance (Positive)	R10B, R10C, R10A, R10H, R10F, R10G, R10I	0.8223
Significance (Negative)	R10D, R10E, R10J	0.5793

According to the alpha values in Table 7, cluster 1 has high internal consistency, and it is related to trustworthiness. Also, the variables that measure significance have

high internal consistency too, but it is difficult to associate a specific concept to them. Alternatively, the remaining sets of variables have unacceptable values of alpha. Consequently, these variables will be analyzed in more detail.

Figure 9. Mechanism of Coordination



Alpha represents how well several variables vary together in the sample. Having a low level of alpha means that variables are not varying well. Table 8 shows that coordination by revising the collaborative plan (R13C) did not happen frequently. The most frequent mechanism of coordination used by the participants in the sample was coordination by mutual agreement

Table 8

Frequencies of the Four Mechanisms of Coordination

Variables Mech. Coordination	N	Mean	Std. Deviation
	Statistic	Statistic	Statistic
R13A	50	4.04	2.17
R13B	50	4.48	1.94
R13C	50	3.42	2.17
R13D	50	5.14	1.86

Analyzing commitment in the same way as mechanisms of coordination (see Appendix C for descriptive statistics) shows that the values of the means do not vary as

much as among the mechanisms of coordination (R3 = 5.9, R9A = 5.4, R9B = 5.6, R7 = 5.8). Several possible explanations could explain the low value of alpha, among them the simplest are that these variables did not measure commitment, or there were different types of commitment.

It was then decided to eliminate all the variables that measure significance: the positive ones because they cannot be associated with a single concept, and the negative ones because they have a low level of internal consistency reliability. Variables associated with mechanism of coordination and commitment were not eliminated because there are aspects that need further analysis, although they may present problems.

Cluster Analysis with a Reduced Set of Variables

Eliminating the variables declared in the previous paragraph, an additional cluster analysis was performed, using Ward's method again. The dendrogram can be seen in the figure 10.

Table 9, similar to the table 6, presents the clusters from figure 10 and their relationship with the operationalization of concepts. In this case the relationship among the variables is clearer than in the first dendrogram in figure 6, and in this table, letters defines clusters. The variables that have an extension dot and *or* mean they are orphans in that cluster. For more details about the sequence in which the variables are clustered, see Appendix D.

Figure 10. Cluster Analysis 2

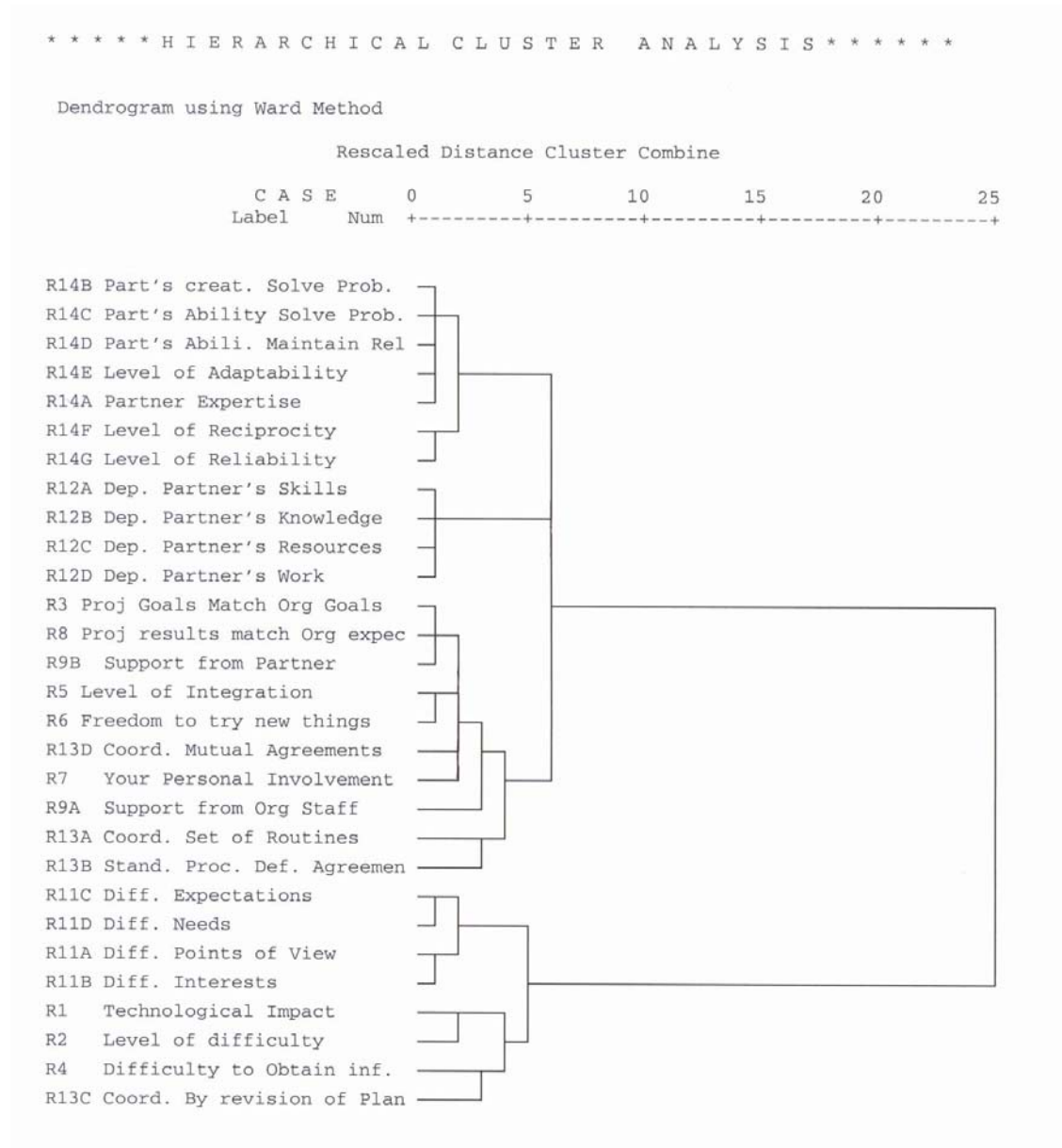


Table 9

Concepts in Cluster Analysis 2

Concept	Operationalization	Question	Group
Trustworthiness	Reciprocity	R14F Level of Reciprocity	b
	Reliability	R14G Level of Reliability	b
	Competence		
Competence	Expertise	R14A Partner Expertise	a
	Creativity	R14B Partner's creativity to Solve Problems	a
	Solve unpredicted problems	R14C Partner's ability to solve unpredicted Problems	a
	Adaptability	R14E Level of adaptability	a
	*Relationship	R14D Partner's Ability to maintain inter-organizational relationships	a
Interdependence	Partner's skills	R12A Dependency on Partner's Skills	d
	Partner's knowledge	R12B Dependency on Partner's Knowledge	d
	Partner's resources	R12C Dependency on Partner's Resources	d
	Partner's work	R12D Dependency on Partner's Work	d
	Coordination		
Coordination	Freedom to do	R6 Freedom to try new things	f
	Opportune information	R4 Difficulty to Obtain information	k
	Mechanism of Coordination		
	Integration		
Mechanism of Coordination	Routines	R13A Coordination by a set of Routines	h.or
	Standard procedures	R13B Standard Procedures Defined by Agreement	h.or
	Planning	R13C Coordination by Revising the Plan	k
	Mutual adjustment	R13D Coordination by Mutual Agreements	F
Integration	Level of unity	R5 Level of Integration achieved	f
Complexity	Technological Change	R1 Technological Impact in the project	j

Table 9 continues

Table 9 continued.

Concept	Operationalization	Question	Group
	Level of complexity	R2 Level of difficulty in the Project	j
Performance	Satisfactory results	R8 Project results match Organizational expectations	e
Commitment	Importance of goals	R3 Project Goals Match Org. Goals	e
	Top management support		
	Opportune resources		Interview
	Partner's commitment	R9B Support from Partner	e
	* Personal Commitment	R7 Your Personal Involvement	f
	* Staff Commitment	R9A Support from own Org. Staff	h(orphan)
Conflict	Diff. Opinions	R11A Diff. Points of View	i
	Diff. Interests	R11B Diff. Interests	i
	Diff. Expectations	R11C Diff. Expectations	i
	Diff. Needs	R11D Diff. Needs	i

The following discussion refers sometimes to both dendrograms. Clusters named with roman numerals belong to the first dendrogram, which includes all the variables. Clusters named with lower case letter belong to the second dendrogram. Cluster *a* and cluster *b* are components of cluster *c*. Cluster *c* is very similar to cluster 1. The only differences are that cluster *c* includes the variable about partner expertise (R14A), and makes a clear distinction between variables and trustworthy (cluster *b*) and competence (cluster *a*).

Cluster *d* and 3.1 are identical, so are *e* and 2.1. In addition, cluster *f* is very similar to cluster 2.2; the differences are that cluster *f* has an additional variable *personal involvement* (R7), and the rescaled distances among the variables are different. In the first dendrogram, variable (R13A) was clustered with variables that traditionally have been associated with having negative effects on collaboration, but

now is with the positive, and is grouped with the variable R13b that previously was an orphan. Finally, cluster *i* and 4 are almost similar, and cluster *j* and 5, and also *k* and 7 are similar.

In conclusion, the second dendrogram provides almost the same output compared with the first one, and almost all the clusters are relatively similar. In general, the second dendrogram has the advantage of showing that the relationship among the variables looks more obvious.

Table 10

Alpha Values of Variables in Cluster Analysis 2

Set of variables	Variables	Alpha
Trustworthiness	R14b, R14c, R14d, R14e, R14a, R14f, R14g	0.9308
Competence	R14a, R14b, R14c, R14d, R14e	0.9075
Dependency	R12a, R12b, R12c, R12d	0.8774
Misunderstanding and/or conflict	R11a, R11b, R11c, R11d	0.9289
Complexity	R1, R2	0.6152
Commitment	R3, R9A, R9B, R7	0.4008
Mechanism of coordination	R13A, R13B, R13C, R14D	0.4779

Table 10 shows the internal consistency of a number of the concepts studied. Although some of the values of alpha are relatively high, there is the possibility of bias that may have been introduced by the design of the instrument.

Multidimensional Scaling Analysis

Multidimensional Scaling (MDS) was used for the analysis of the data from a different angle. The objective here was to find a map of collaboration within the participants' answers (Kruskal et al., 1978). Usually, this method is employed to find hidden structures. Using SPSS™ 10.0 for Windows®, multidimensional scaling method was employed by eliminating the variables related to significance. The best

representation requires finding a solution with the minimal stress, and not degenerated.

Table 11 shows different values of stress for different dimensions analyzed.

Table 11

Values of Stress for Number of Dimensions Analyzed

Number of dimensions	Stress Value	RSQ
2	0.22859	0.85667
3	0.13619	0.92694
4	0.09510	0.95515
5	0.07153	0.97028
6	0.05774	0.97801

A six-dimensional representation has the best stress value and RSQ, an indicator of variance in relation to the original data. The Shepard diagram shows a good relationship between $f(\delta_{ij})$ and (d_{ij}) , and can be seen in Appendix F. Due to the fact that six dimensions are so difficult to visualize, three dimensions were used because it has an acceptable stress and accounts for RSQ = 0.92. Table 11 shows the different values of stress and RSQ for different number of dimensions.

The Euclidian distance of each variable in relation to the origin (0,0,0) was calculated as $SQR((R_{i,Dim1} - 0)^2 + (R_{i,Dim2} - 0)^2 + (R_{i,Dim3} - 0)^2 + (R_{i,Dim4} - 0)^2 + (R_{i,Dim5} - 0)^2)$; where R_i is the variable i , and Dim represents the dimension (See appendix F), the statistical software does not compute this distance. Variables were ordered to identify possible direction of concepts in relation to the center, and the variables closest to the center were R5 and R6, which are related with integration and freedom to try new things. The variables farthest from the center were R11B and R4, which are related with integration and freedom to try new things.

Figure 11. Difficulty to Obtain Information vs. Integration

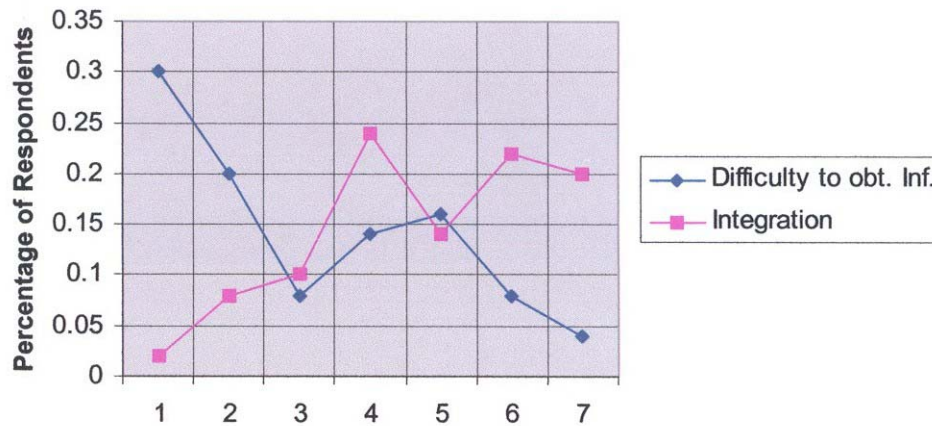


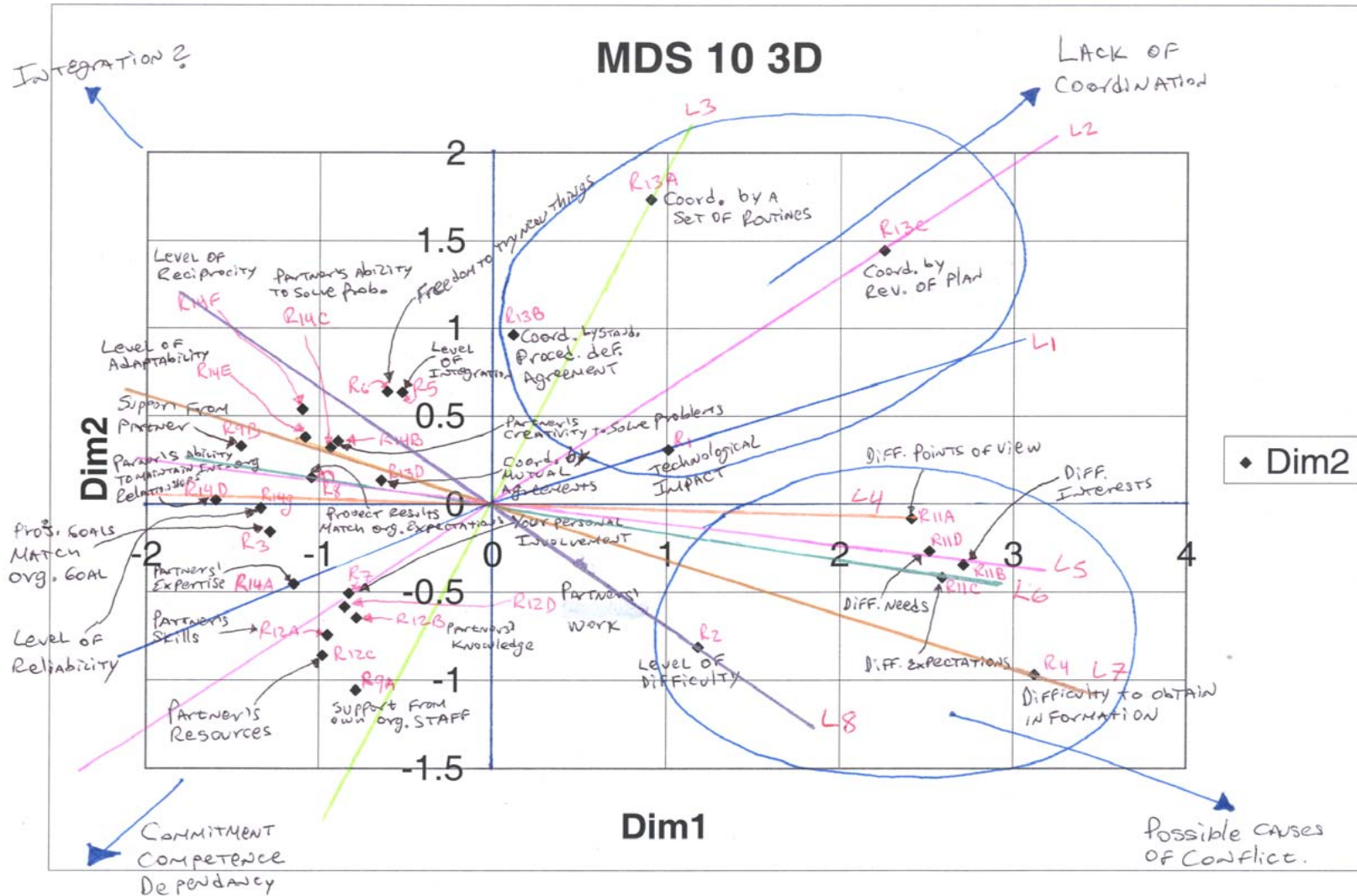
Figure 11 shows that for this sample the difficulty to obtain information (R4) and integration (R5) are almost totally opposite variables. It suggests that the collaboration map may show similar relationships. In order to look for relationships, a three-dimensional space can be represented by two planes. The planes chosen were dimension1 – dimension2 and dimension1 – dimension3. Consequently, the map of collaboration needs two graphs that can be seen in figures 12 and 13.

The following section refers to figure 12. At this moment, it is known that R4 (difficulty to obtain information) and R5 (level of integration) are opposite concepts. R4 is in quadrant four, R5 is in quadrant two, and drawing a line from R4 through the origin to quadrant two. The three points, R4, the origin, and R5 form approximately 152° angle (See line 7 (L7) in Figure 12), which may indicate the existence of relationships between variables that form 180° (including the origin). Also, it is recognized that not all the mechanisms of coordination were used with the same frequency. Coordination by mutual agreement (R13D) was the most frequently used, and the least used was coordination by revision of the plan (R13C). Ordering by frequency of usage of the

mechanism of coordination variables, the sequence goes from R13D to R13C (R13D > R13B > R13A > R13C). Finally, the alpha for variables related to commitment is 0.4008 and for mechanism of coordination 0.4779 (See Table 10). The degree of dispersion among these variables, mechanism of coordination and commitment variables, is not reflected in figures 12 and 13.

Line 4 (L4) that begins in point R11A (different points of view) in quadrant four (Figure 12) and through the origin, and almost intersects point R14D (Partners' ability to maintain inter-organizational relationships) in quadrant two. In a similar way, different relationships were found and are shown in table 12.

Figure 12. Dim 1 and Dim 2



objectives. However, this is only one possible explanation, and there could be more.

As line two (L2) moves counterclockwise towards line three (L3), the lack of coordination is reduced, and line two sweeps the following variables: personal level of involvement (R7), support from the staff in your organization (R9A), dependency in your partners' skills (R12A), and dependency in your partners' knowledge (R12B), dependency in your partners' resources (R12C), dependency on your partners' work (R12D). It seems that the more coordination achieved among partners, the more dependency and commitment are needed.

Table 12

Relationships Between Variables

Variables	Line	Opposite concepts	Figure
R1 – R14	L1	Technological Impact in the collaborative project - Partners' creativity to find new solutions	IV.6
R13C * – R7	L2	Lack of Coordination (not revising plan) - personal level of involvement	IV.6
R13A * – R9A	L3	Lack of Coordination (not def. a set of routines) - Support from the staff in your organization	IV.6
R11A – R14D	L4	Different points of view - Partners' capacity to maintain inter-organizational relationships	IV.6
R11D, R11B – R8	L5	Different needs, Different interests - Project results match original expectations	IV.6
R11C – R13D, R8	L6	Different expectations - Coordination by mutual agreement, Project results match original expectations	IV.6
R4 – R14C, R14E	L7	Difficulty to obtain information - Partners' ability to solve unpredicted problems, Partners' adaptability	IV.6
R1, R2 – R12C	L9	Technological impact in the collaborative project, Level of difficulty in the collaborative project - Dependency on your partners' resources	IV.7

Table 12 continues

Table 12 continued.

Variables	Line	Opposite concepts	Figure
R4 – R14A, R14C, R9B	L10	Difficulty to obtain information - Partners' expertise, Partners' ability to solve unpredicted problems, Support from your partner organization	IV.7
R11A, R11C – R9A	L11	Different points of view, Different expectations - Support from the staff in your organization	IV.7
R11D – R3	L12	Different needs - Project's goals match organizational goals	IV.7
R13A * – R6	L13	Lack of coordination (by not defining a set of routines) - Freedom to try new things	IV.7

Unidimensional Map

Tables 13 and 14 show unidimensional maps following the procedure described in the previous Chapter. The first one shows that commitment was the most important factor in the decision making process in the collaborative project, followed by trustworthiness and competence. The second illustrates an aspect that has been already identified in the figure 9 and table 8. Mutual agreement was the most frequent mechanism used to coordinate activities. In table 13, smaller values mean more relevant factor, and in table 14, smaller values mean more frequently mechanism of coordination used. For instance, in table 14 the value 26.57 for mutual agreements and the value 36 for standard procedures express that mutual agreements were used as mechanisms of coordination, most frequently almost a value of 10. The maximum value of the scale is 100, and the minimum is zero.

Table 13

Unidimensional Map for the Significance of Factors that Affect the Collaborative Project

Value	Question Number	Factor
11.71429	R10b	Commitment
13.14286	R10a	Trustworthiness
13.14286	R10c	Competence
17.42857	R10g	Coordination
21.71429	R10i	Integration
22.57143	R10f	Interdependence
22.57143	R10h	Complexity
42	R10j	Uncertainty
44.28571	R10d	Conflict
54	R10e	Risk

Table 14

Unidimensional Map that shows the Frequency in which the Mechanism of Coordination were used

Value	Question Number	Mechanism of Coordination
26.57143	R13d	Mutual Agreement
36	R13b	Standard Procedures
42.28571	R13a	Routines
51.14286	R13c	Revision of Plan

Summary

The results of the study were positive but preliminary, given the restriction and limitations of the study. The relationships found using cluster analysis were consistent with the original expectations. Multidimensional analysis helped to find interesting relationships, such as those different points of view required so that partners' have the capacity to maintain inter-organizational relationships. These types of relationships will

require further investigation. In Chapter 5, further discussion of the findings and implications are included with suggestions for additional research and conclusions.

CHAPTER 5

DISCUSSTION AND RECOMMENDATIONS

This Chapter is divided into four parts: the first part answers the propositions formulated in this study, the second discusses the implications of this study, the third makes some reflections about the problems associated with collaboration, and finally future studies are suggested. The information from the 38 interviews is used in the first part of this Chapter to give a better understanding of the questionnaire results, and provide some background information.

Answers to the Questions of the Study

This study has three questions: a) what are the factors that affect the nature of collaboration according to the perception of the partners collaborating in the funded projects? b) are there relationships among the factors that may affect collaboration? and c) what are the stages in the collaborative project? The results of this study suggested relatively positive answers. However, new questions emerged, and further research will be needed.

Question One: What are the factors that affect the nature of collaboration according to the perception of the partners collaborating in the funded projects?

In order to answer the first proposition, a cluster analysis was performed and the results presented. The operationalization of trustworthiness, competence, dependency, and conflict was very positive and the alpha factors for internal consistency were high, 0.9308, 0.9075, 0.8774, and 0.9289 respectively. Variables associated with complexity behaved as predicted and clustered, but its alpha is low (see table 10).

The order in which variables were clustered followed the next sequence of

concepts (see figure 10): competence, trustworthiness, interdependence, some of the variables related to commitment, objectives, integration, coordination, conflict, complexity, and possibly lack of coordination. Although, the results of this study were exploratory, it is important to recognize that the sequence in which the variables clustered may have a relationship with the order in which the variables on those projects evolved. For instance, in these projects competence was the most relevant factor in the decision making process, and also was the first factor to cluster. It will be interesting to do further research in this direction.

Variables related to competence were the first to cluster in the Dendrogram, which means these variables were the most similar and their distance among themselves was the closest. It was expected that potential collaborators look for partners who have specific skills, problem solving abilities, creativity to confront new situations, capacities, and those with the resources to achieve common objectives. Zand (1997) establishes that leaders are not going to leave their future opportunities in the hands of people who are incompetent or who lack a reputable record of competence. In general, people do not put the care of their health in the hands of a professional without the credentials and the experience needed. In the same way, potential partner organizations are not going to join with one lacking recognized levels of competence.

Trustworthiness was defined as competence plus the levels of reliability and reciprocity. Reciprocity is an important component of trustworthiness in a relationship (Zand, 1997). Partners have to have an impression of sharing a common future (Kouzes & Posner, 2002), also known as the *shadow of the future* (Sydow, 1988, p. 50). A

collaborative relationship is not likely to last if a partner is not reliable and/or is unable to reciprocate. In other words, the fact that all these variables have clustered means that the participants perceived them as closely related, and this gave support to the conceptualization of trustworthiness. Also, the participants considered that the variables associated with this concept are characteristics that apply to their partners. However, these results should be taken carefully. Trustworthiness is a very complex concept, and this research did not make a differentiation among different types or levels of trustworthiness (Bachmann, 1988; Lane, 1988) or the conceptualizations and measurement of many others.

The findings show that the participants in this study perceived that their dependency on their partners' skills, knowledge, resources, and work as an homogenous set, and they accept their dependency on their partners. For Kouzes et al. (2002), interdependence is a condition in which "the success of one depends on the success of the other" (p. 251). In a collaborative effort, the success of the project was based on an acceptable degree of success of each one of the partners, and also meant that partners depended on each other. Curtis (2001) addresses that participants have to recognize their dependency on the others in order to achieve a common goal.

Achieving the expected results is clustered initially with the commitment from the partner(s), and the commitment to the project's goals. Joined to the same cluster are: the level of integration, the freedom to try new things, coordination by mutual agreements, and the personal participant's involvement. A possible interpretation could be that in order to achieve the expected results, commitment is needed as well as coordination of activities and a certain level of integration among the partners. This

relationship is not direct; a cluster analysis just tells us that the variables are closely related and have the minimal variance. Johnson, Zorn, Tam, Lamontagne, & Johnson (2003) found that “strong leadership, commitment, communication, understanding different cultures, pre-planning, providing adequate resources, and minimizing territorial aspects” (p. 201) were the most important factors that contributed to the success of a collaborative effort. Johnson et al (2003) define strong leadership as “governor’s support; and support from upper management/someone who can make a decision” (p.199). Their definition of *strong leadership* in the context of this research is essentially commitment; commitment means not giving up easily. They are describing a different specific set of projects, commitment, dependency, and reducing aspects that may produce conflict, are present in their research and are beneficial to the success of a collaborative project.

There were factors that did cluster separately: commitment, coordination, and mechanism of coordination. It was noted in the previous Chapter that the mechanisms of coordination did cluster separately because some mechanisms were not used as frequently as others.

In the case of some of the commitment variables, one possible explanation for not having a close relationship among those variables is that they are not related with the concept. Another possible explanation is that commitment has different components, and the concept needs to be studied in more detail. Another possibility is that a variable or a set of them may be absent in the collaborative relationship. The same arguments can explain the dispersion of coordination variables.

Better understanding of commitment comes from the interview data that shows

that participants from nine different projects recognized the existence of lack of commitment. Some reported lack of commitment in their own organizations, such as lack of support from top management or their own staff. In other cases, partner organizations committed just one or two people to the collaborative project, and these staff members had to do many activities for their own organizations, and those activities had priority over the project activities. Other participants reported different levels of commitment from different partner institutions. A few project members reported that they worked totally independently, they did parts of the project and later integrated them. Working independently is not a bad strategy if a project does not require some level of integration, but in opposite circumstances, it represents lack of commitment.

In one of the projects, the decision-makers hired a project coordinator; the strategy was to give them all the responsibility for the project. Unfortunately, they did not provide the project coordinator with enough authority to achieve the project goals, thus the project coordinator found out that some of the directors from the partner organizations were very enthusiastic, interested and involved, but not all. Participants in this project considered the objectives important, but when it was necessary to achieve results and to do the needed activities, their answer was not enthusiastic. Some staff members from the different partner organizations were interested in the project, but they did not have time to help. Project activities were not a priority for their organizations, and the project coordinator was not properly integrated with the different partner institutions. Sometimes, middle management members did not know who the coordinator was, nor did members who should have known because their responsibilities were related to the project.

Although, conclusions from the interviews about coordination cannot be extrapolated, only one participant in a project accepted that they did not achieve a high level of coordination in their project. An indirect way to have an understanding about coordination in collaborative projects is to know how partners integrate among themselves.

Participants were asked during the interview about how they facilitated integration between (among) organizations. Four participants stated that they had previous relationships, and they did not have any problem proposing new ideas or activities to their partners. In their relationships, they were not required to establish many formal agreements with the exception of the basic ones. They had known each other for a long time, and some of them had interaction beyond their professional activities.

Four other participants provided very interesting aspects about integration among the partners. Two of these cases declared they were available to go to their partners' place of work to get resources for the project, to bring extra work from their meetings, and to put in staff time. They hired a new staff member who knew the problems of both partners. Partner organizations were situated very close to each other, less than a ten-minute drive, which probably benefited the integration process. Another participant expressed that she and the participants in her project liked to have fun in their meetings, and they saw the project as a real opportunity. The same participant considered that a very important issue was to keep things light and less serious, in order to have a great deal of camaraderie. An additional characteristic that facilitated their integration process was the fact that their partner organizations were situated in a small community where

everybody knew each other professionally. It was also expressed that personal contact was important. In another case it was explained that integration in their project was difficult because in their own organization, there was resistance, and on one occasion the coordinator suffered from sabotage in one of the project activities.

Three participants revealed that personal attitude played a fundamental role in the integration process and expressed the need for partners to be aware that collaboration implies more than one person; new ideas needed to be considered with kindness and to support them if they were feasible. Furthermore, participants found patience was necessary because when they had different organizational cultures they needed to learn about the new environment and to adapt to new circumstances. Also, the fact that people had had previous personal and/or professional contacts does not mean they can work together in a collaborative project. Probably, partners would require adapting to each other and to different decision-making processes, appreciating the similarities and the differences, but over all, most of the time, accepting the differences. Lastly, the role and way in which the project manager behaved was very significant in their integration process.

Thirteen of the participants did not answer specifically how to facilitate integration with their partners. Some of them mentioned that commitment facilitated their collaborative project. One of these participants said that the organization and their potential partners were always paying attention to grants available in order to obtain resources, and they could work together. Another participant considered integration as the initial step in which the partners come together, when they have common interests and share what they want to do.

Four participants mentioned that they used meetings as a way to facilitate integration. However, one participant in this research commented that in their particular project meetings, there was a little too much talking. It was recognized that a better option could have been to put more emphasis on the outcomes, and tangible results. Three more participants revealed that partners worked independently, and they did not have a need to integrate. Finally, two cases accepted they were not able to achieve integration with their partners.

The set of answers in relation to how to achieve integration in a collaborative project shows that there is not a straightforward response. Some participants are aware of the necessity of integration, but no single question provided a set of steps that told what to do, not even a procedure based on their own experiences. A few partners had done it, but may not be aware of how they did it.

Finally, at the bottom of the dendrogram, there are the variables that are associated negatively with collaboration. Conflict and complexity are two factors that are considered negative for collaborative efforts. Ohlinger, Brown, Laudert, Swanson, & Fofah (2003) recognize that unmanaged conflict can sabotage team progress and increase tensions and disagreements. Also, conflict is not an isolated variable. Smith (1998) declares that when there is not enough trust among collaborators, the possibility to express differences depends on the degree of trust among them. Conflict and differences could be expressed when there is an environment and level of trust that allow disclosing them (Smith, 1998). There are different types of complexity; complexity of the project, that can include complexity of the task, but also difficulties with the relationship, and complexities associated with the environment in which the project is

executed. In this study, the complexity variables studied for the variables are related to the difficulty of the project, and in that sense is considered a negative factor.

Question Two: Are there relationships among the factors that may affect collaboration?

The second question is partially answered with the use of multidimensional scaling. Some of the relationships among concepts are clear and direct, but others require further research. For example, the map of collaboration suggests an opposite relationship between the variable freedom to try new things (R6) and infrequent use of a set of routines as a mechanism of coordination (R13A). Future research will address under what conditions this relation may exist.

Multidimensional scaling suggests a set of opposite relationships among or between the variables. However, it is a problem to define when these relationships are present in a collaborative effort. The first relationship represented by line one (L1) in table 12 sounds reasonable. Technological impact in collaborative projects will require not only partners' creativity to find new solutions, but also the creativity of all participants. Similarly, when there are different points of view among the participants, it is convenient that participants have interpersonal communication skills that allow them to maintain the relationship at the same time as they work to achieve their goals. Additionally, when partners have different expectations, it is difficult to achieve a certain degree of coordination, and also their objectives (Johnson et al., 2003).

From the set of opposite relationships between the variables in table 12, only one was significant in numeric terms, (R4-R9B) the difficulty to obtain information and support from your partner organization. The correlation between these two variables is (-0.760), and the correlation is significant at the 0.001 level, 2-tailed, (see Appendix G).

This result implies that a practical tactic to estimate partners' commitment in a collaborative effort is related with level of exchange of relevant information among partners.

From the rest of the set of opposite relationships between variables (see table 12), another interesting result is that 14 of those relationships have negative correlation coefficients, but relatively small (see Appendix G). These coefficients propose that there is not a single variable that determines a negative relationship, but probably a set of variables may negatively affect others. Additional research is needed in that direction.

Question Three: What are the stages in the collaborative project?

The answer to the third question is positive. A high percentage of participants (84%) identified at least five collaborative stages: execution, networking, definition, relationship and common evaluation. These stages are generic, specific activities differ from project to project. There is a difference of eight percent between the execution and the definition stages, and the execution stage is the most frequent. This result seems consistent considering that coordination by revision of the plan was the least frequent mechanism of coordination used by the participants in the sample. This result may suggest possible problems with the definition stage and also with the coordination of the collaborative activities of the projects.

The stage named *partner's evaluation* is difficult to identify because participants do not necessarily accept that they assess their partners even in an informal manner. The low level of participants that recognize the common evaluation stage was not expected because it was very important that partners know where they are and where they are going (Doz, 1996; Ring & Ven, 1994). Finally, at first sight, it did not seem

logical that the redefinition of the conditions stage was recognized for just half of the participants. However, 54% of the participants worked on projects that can be considered traditional in which the impact of technology is not as high as the impact that technology has on digitalization projects. In other words, the more complex a project is, the more redefinition of activities, agreements, and others are needed.

Three different types of projects were identified: digitization, exhibit, and program. Some projects are a mixture – exhibit and a website, or program and a website. However, they were considered to belong to a single category because the websites were not the main objective of these projects. The descriptions of the projects are not done in detail, and only aspects not mentioned previously were added superficially to complement the understanding of the different type of projects.

Exhibit Projects

Eight participants from three different exhibits were interviewed, and the general description they offered was the following:

a) defining the theme of the exhibit before applying to the grant - occasionally, one partner defined the theme and a preliminary plan. Having a preliminary plan and theme, they approached the possible partner. Another mechanism used was to have informal encounters and when they found a possible source of funding, partners sit down to define what they had been talking about informally. Sometimes, when the possible partners have had previous experience working together, they just approach with an idea. In the last circumstance, they have already developed a strong bond, and they already trust each other.

b) Writing the proposal is the next step. At times, just one partner writes the proposal.

c) Programming of activities and the definition of individual and/or team in charge were outlined after the grant was awarded.

d) Designing and developing the exhibit.

e) Researching for the content of the exhibit.

f) Producing the exhibit.

g) Spreading the word about the exhibit.

h) Installing the exhibit.

i) Evaluating the exhibit.

j) Reporting to the granted agency.

During the interviews, participants in exhibit projects commented on aspects related to stages asked in the questionnaire. Here, it follows a synthesis of their comments:

Beginning of the project – Two projects have had previous working relationships. One of these two projects had two partners, one of them had a previous working relationship, and the other had organizational connection. The third project found its partner by referral.

Definition – in one of the projects, it is clearly expressed that partners defined together the projects. In the other two, it is not clear. In this stage, they described activities like: definition of needs, resources, committees, agreements, goals, and how to handle the budget. However, one of the exhibits was managed by negotiation, if any activity has to be negotiated, probably, the definition of activities or the relationship may

have some problems.

Relationship – In one of the exhibits, there was some problems with trust, and in the community, there are some racial problems that affected the relationship. In other exhibits, it was described that the relationship went through different phases from good camaraderie to frustration' From time to time, not having good communication or expected that an organization was going to do something, and that organization was not able. In the other exhibit, the relationship was expressed as great with huge contact with the community. They had strong organizational ties, and they knew personally the members of the partner organization because they lived in a small community.

Common evaluation – two exhibits evaluated the exhibit. They asked the public their opinions, but they did not evaluate the project as a whole. The other exhibit did not report any specific evaluation mechanism.

Redefinition of conditions – one of the exhibits had to redefine many activities because they depended on a minority in the community, which they did not know very well. As they were learning, they had to modify some aspects of the exhibit. Other exhibits, experimented a lot of misunderstandings: very different cultural organizations, different age cohorts, bigotry of supervisors, racial mistrust, and employees with low morale.

Program Projects

Under this category, there were seven different projects and eleven interviews. Two of these projects developed a Website, and in one project of this category, it was difficult to understand what the goals were. The general phases of a program were the following:

- a) initial discussion,
- b) proposal writing,
- c) grant awarded,
- d) plan the program,
- e) design the program,
- f) develop the program,
- g) deliver the program,
- h) evaluation of the program, and
- i) writing the report for the granted agency.

At the beginning of project – in four of these projects, the institutions have worked in the past. In other project, two members of the staff have been friends previously, and they saw the opportunity to collaborate. Another project had only one person put together the project, and in the last one the interviewee did not know how the collaborative process started.

Definition – the activities that were defined in these types of projects were: program, time lines, assignments, agreements, goals, plans, programming, committees, and in general, the organization of the project.

Relationship – the participants in two of these projects assured that the relationship among partners was from good to excellent. Three of them declared the relationship was difficult because they had different organizational cultures, and touchy with the technical personnel. Two projects were having difficult relationships. In one of them the problems were on a staff level, and in the other one the problems were at the senior management level. In the last two projects in this category, the interviewee

reported no relationship at all.

In one project, with no apparent relationship, a project coordinator was hired and a company developed the Website. The project coordinator put together all the parts, but there was no interaction among participants. In the other project with no relationship, the causes for that situation were not explained.

Evaluation – Most of these types of projects hired an external evaluator, who essentially evaluated the program. In only one project, the interviewee was not sure of the evaluation phase, and was aware of using a survey, but mentioned that no evaluation had been seen for the project as a whole. One of the projects developed a pilot study that allowed them to focus on the project. Although there was no formal evaluation of partners, participants in two projects considered their partners bureaucratic and slow.

Redefinition – there were changes in the projects of this category, and the main causes were the following: attraction to the program of a slightly different population, the partner had to restructure due to budget cuts, and changes in staff. There was also the decision to contract a Website instead to develop it.

Conflict – Participants reported many possible causes of conflict. Among those possible causes were: different mindsets, different organizational cultures, lack of commitment from the rest of the organization, the organizations having contradictory rules for the same program, inconsistent vision among staff of partner organization, grant budget distributed unequally, different expectation of the staff, staff changes, the logistic for doing the program, coordination of activities, no productive meetings, difficult relationships, not having a good definition about who does what, and even geographical

distance. Some of the participants accepted that in a collaborative project there were conflicts and misunderstandings that could not be solved; they just had to be accepted.

Digitization Projects

In this category, there were 12 projects and 19 participants were interviewed. These projects digitalize different types of resources and collections and make them available. The final product of the majority of them was a Website. One of the projects focused on the development of digitization standards, and the other one was a set of pilot projects that gave hands on experience to the participants. The generic process described in this section does not fit totally all the projects, but it gives an idea. The general phases of a digitization project were the following:

- a) brainstorm and initial definition,
- b) submit the grant application,
- c) meet the advisory committees,
- d) decision making process,
- e) purchasing hardware and software, if it is needed.
- f) hiring staff and/or outsource
- g) selecting resources
- h) defining standards
- i) building curriculum around
- j) revision by curator if it is needed
- k) scanning
- l) cataloging resources
- m) data entry

n) evaluation

o) final report for the granted agency

Beginning of project – there was a diversity of ways in which these projects started. In four of them, one member of the organization, usually the director of the institution, approached the others with the idea that was developed over time. In three of them, an informal networking process happened. In one of the projects, the institutions applied to the grant independently, and the granting agency suggested they work together. From the rest of the projects, there was no clear idea how they started.

Definition – in all the projects, the definition of activities was developed in the original proposal.

Relationship – Most of the projects believed that the relationship between/among partners were very good or excellent. One of them qualified the relationship as respectful and another as cordial and relatively efficient. In one of the projects, the relationship with one of the partners was qualified as very good, and in another there were misunderstandings that never were solved.

Evaluation – Most of the participants on these projects reported they evaluated the product of the project in different ways. Some used outcome evaluation, usability, surveys, performance data, periodical reports, pilot project, or hiring and external evaluator. One participant said that in her project they were struggling with the evaluation. In two projects, it was not possible to know how they were evaluating the process.

Conflict – the possible causes of conflict expressed were the following: lack of experience and technical knowledge, different priorities, different schedules of the

participants, lack of resources to make it happen, different skill levels of participants, different and/or incompatible technologies in use, communication problems, distance between/among partners, different organizational cultures, change in the management of the partner, different levels of accountability among partners, other challenges needing attention beyond the project, changes in leadership, changing circumstances involving personnel, project staff with other multiple duties, lack of technical standards, incongruent and/or lack of definition of partner's roles and responsibilities, and the central administration of funds.

Speculations

Identifying aspects that can make a collaborative project successful is an appealing outcome. In order to predict a phenomenon, it is necessary to be able to describe and know its behavior. In other words, the components and the relationships among those components should be known, its interactions with its natural environment, how the phenomenon behaves under different circumstances, and what its limitations are. Until now, that knowledge has not been available for collaboration. It was asked both in the questionnaire and the interview, how successful were the projects. All of them reported a relatively high level of success, even when the description of projects, caused the researcher to doubt it, which essentially is one of the restrictions of self-reporting.

Successful Projects

Among the most successful projects according to the researchers perspective, was their ability to have a good relationship, and accepting the differences in organizational cultures and agendas among the partners as part of the collaborative

relationship. They developed a real understanding of each other, and appreciated each others work. They did not report major conflicts, and the ones they had were solved or accepted as restrictions of the collaborative process. Also, they had a fair distribution of the grant budget, and participants in those projects had a more result-oriented mindset.

In the less rewarding projects, participants did not have too much communication face-to-face and/or when they had it, they had a lot of problems. They reported having different expectations, and never were able to articulate them. These types of projects reported that difference of opinion was a factor that was not easy to overcome, and produced internal conflicts and high tensions.

Levels of Collaboration

Exhibits and programs were the least complex projects. Complexity is a relative term. Something could be less complex if the participants had previous experience, were familiar with the partner, the technology, and understood the general know-how. Exhibit projects that traditionally have been developed by museums, and both institutions, museums and libraries, have conducted programs. Although, the implementation of exhibits and programs can have some problems associated with them. The staff in these organizations had experience with them. Technology and standards are not necessarily mature in the case of digitalization projects.

Most of the projects interchanged resources, and few of them interchanged concrete materials or services generated by the partner(s), and only some had common activities beyond their meetings, although, there were some exceptions. Consequently, the level of integration of activities was relatively low in many of them.

The level of commitment among some of the partners was relatively low. Sometimes, the lack of commitment was at the level of senior management, and others at the staff level. At the senior management level, their priority was not the collaborative project. Senior management could delegate the project and forget about it without providing the infrastructure, resources, and support needed. At the staff level, some participants were not committed to the project. For them, it was just more work.

Some of the comments of participants related to lack of commitment were the following: (a) they would like to see more staff from institutions involved in the project. One of the problems they had was that institutions assigned maybe one person to work on it or maybe two, and other than that nobody else. It was often so difficult to get the rest of the organization; (b) everybody supported the idea of the project, but that was not turned into concrete actions; (c) it would be very nice to have more involvement, if they just had more support from the top-down within institutions; and (d) there were a lot of people who were very interested in the project, but they did not have the time to help the project coordinator to represent their interest as well as one could. This project coordinator did not hear from the participants because of their time restrictions.

Without commitment, coordination is not possible. Responding to changing conditions, learning as things happen, going through several people to get something done, repeated requests, and meetings could be a nightmare.

Given the level of complexity involved, low level of commitment, interdependence, and coordination in some of the projects, many projects could be classified in the category of exchange of resources and/or services. Given the technological competence, high level of commitment, greater level of interdependence

and coordination, few projects could be considered as a cooperative level. In the cooperative level, partners co-participate using work units, but all the members of each unit belong to the same organization.

Only one project could be considered at the collaborative level, in which partners integrate work teams with members of different organization. The project had support from both top management and staff, and the level of interdependence and coordination was relatively high. The level of competence showed through the documentation that they generated during the entire project.

Power Asymmetry

A constant characteristic of many of these projects was the fact that one organization had more power than the rest of partners. The organization that was the recipient of the grant and managed the budget could influence the other partners. This situation could be positive when the rewards for other partners are considered satisfactory, but it may cause lack of commitment in the opposite situation.

Sequence of Stages

Finally, a possible sequence of the stages in the collaborative process in general was discussed. This process supposes that the partners achieve a *high* level of coordination and integration, and it is not developed with full detail given the scope of this study. Networking could be an initial stage when the possible partners do not know each other, and they start with small exchanges mainly of information. In this stage the level of uncertainty and risk are considered important factors (Ring, 1996). As partners share information, and learn about each other as trust develops, partners take more risks.

One problem that is not frequently discussed in detail in the literature of collaboration is how the initial collaborative process starts. The idea of networking came to the researchers attention from (Westley et al., 1991). Although, these authors do not develop the idea of networking in collaboration, they talk about creating bridges as a way of collaboration. Kreiner and Schultz (1993) discussed the formation of network in a collaborative effort. They suggest three stages in network creation in the collaborative process: discovery of collaborative opportunities, exploration of collaborative opportunities, and crystallization of collaborative relations.

Networking is not necessary the initial stage in a collaborative process. Meyer (1993) describes a case in which two organizations are forced to work together, one of the organizations, a German company, saw the other, the American, as a potential competitor. Over time the German company understood that it did not have the resources and time to compete with the American organization. The American company was new in the market, and it was not rewarding strategy to try to eliminate the German part, so they decided to collaborate. The American part was in charge of the database and the interface, and the German company was in charge of the hardware and other aspects. Essentially, this collaborative project started in the conflict stage.

Brown (1995) explains how conventions facilitate coordination of activities through consistent patterns of behavior. Kumar, et al. (1998) give an example about how social conventions allow small companies to collaborate in the textile industry in Prato, Italy. A company can receive an order, and the order pass from one workshop to another without supervision from the company that originally received the order. The social conventions work without central authority, and many times the original company

does not know who is doing what, but it receives satisfactory results.

When the networking stage starts, two other stages start at the same time, relationship and partners' evaluation. In the relationship stage, relationships between members of partner organizations are developed incrementally (Winer et al.; Ring & Ven, 1994). They can be formal and/or informal (Chisholm, 1989), and partners start with small informal exchanges (Blau, 1974b). As the relationship develops, each partner organization learns about each other (Doz, 1996), and organizations achieve some level of integration over time. The relationship depends on the level of trust among the partners, commitment, and the capacity they have to solve disagreements.

In the partner's evaluation stage, members of each organization are evaluating informally the benefits and costs they could receive from the potential or actual collaborative project based on its own expectations. The idea of evaluating the organizational partner is present in different collaborative perspectives described in Chapter 2, but not necessarily used in organizational context. In the networking stage, all the relationships created among the members of the organizations are informal essentially (see Figure 14).

When the partner organizations found a common interest and decided to work together, the parties developed the definition stage that could include all or some of the definition of the following: joint vision, objectives, goals, plan, agreements, identify alternatives, costs, investment and resources needed, and define rules and obligations for future actions by negotiation. At the beginning of the definition stage, potential partners consider each other trustworthy and competent enough to complete the project. This stage is rooted in the literature of problem solving and planning. In the

collaborative context, (Winer et al., 1994) develop it in detail.

When partners finished to define what they want and agree on it, they carry out the activities to achieve their vision and their objectives, which is the execution stage. At the same time, there is a learning process about what works and what does not, both in the project and in their relationship (Winer et al.; Ray, 1994; Ring et al., & Ven, 1994; Doz, 1996). In this stage, partners need to show their level of competence in order to achieve their goals. There is no better way to provide competence than getting concrete results.

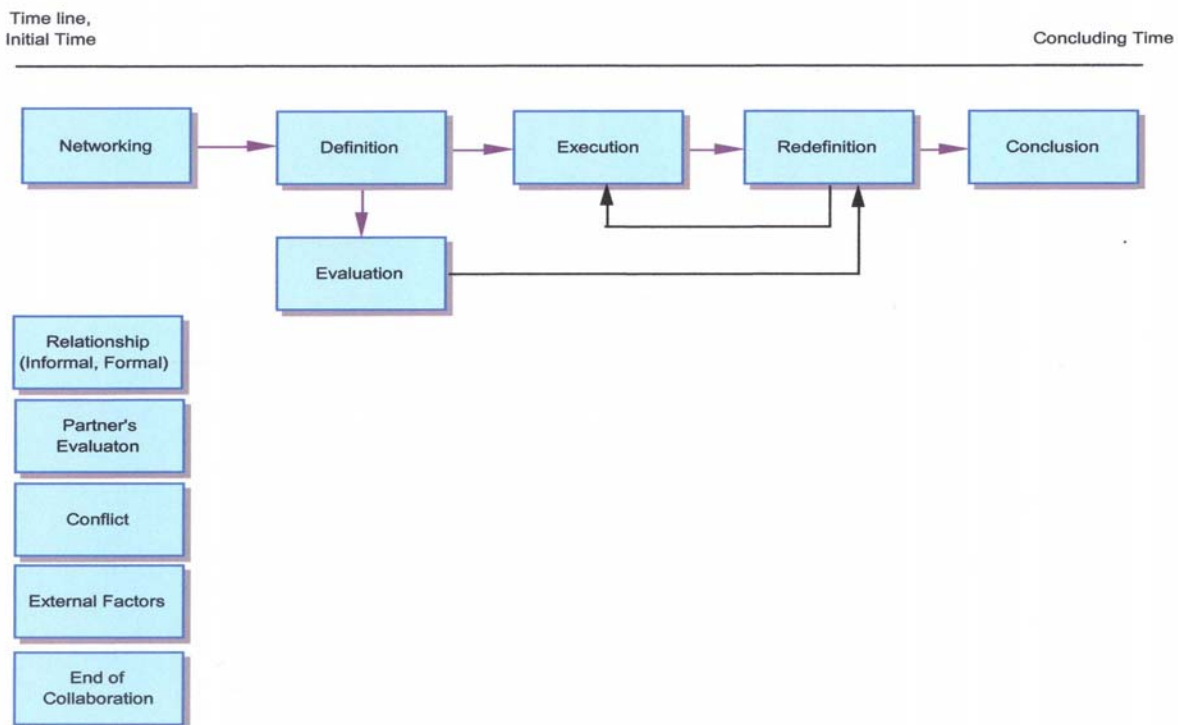
Factors that are important in the execution stage are trustworthiness, commitment, and the capacity to solve misunderstandings. In order to define what partners can do, they need to trust each other, demonstrate some level of commitment, and have members with interpersonal skills that allow them to achieve agreements with the minimal friction possible.

Misunderstandings, problems in the relationship, setbacks in goals, changes in the initial conditions, external factors, and others force adjustment of the collaborative objectives and agreements to adapt to new conditions, which is the redefinitions of conditions stage (Doz, 1996; Winer et al.; Ray, 1994). During the entire project, maintaining a fair exchange may benefit the integration process (Blau, 1974b). Other factors that benefit the integration process are commitment and trustworthiness. In the case of conflict, the level of trustworthiness and the quality of the relationship could make a difference in the way partners perceive the other (Ariño et al., 1998).

The collaborative process can finish any moment for different reasons, even before it starts properly. The effect of external factors and conflicts can be present

during all the process (Isenhardt et al., 2000), which will require skillful negotiators if the partners want to continue the relationship. The common evaluation does not have to be one of the last stages in the collaborative process. In fact, it is convenient that it starts at the same time that the definition stage starts. From the definition stage, it is necessary that partners answer questions like the following: Are our expectations realistic given our present circumstances? Can we have the commitment from the top management in our respective organizations to achieve the collaborative goals? Are our organizational cultures so different that we cannot work together? Under different circumstances, different aspects may have different priorities. Also, different circumstances may affect the sequence of stages in the collaborative project.

Figure 14. Generic sequence of stages in a collaborative project.



Implications

Implication for the Profession

Many people ask, what is the relationship between Information Science and collaboration. Trustworthiness is apparently a fundamental factor in a collaborative effort, and how can it be known that a potential partner is capable? The essential element is information. In collaboration, there are very interesting problems. The level of information as exchange is an indicator of the partners' commitment, how information should be provided in a collaborative effort in order to avoid lack of coordination among partners, and reduce misunderstandings and conflicts. Finally, Information Science is interdisciplinary, and problems related with information are complex. No single person can have all the knowledge and skills to attack those problems, which is another justification to study and understand the problem of collaboration.

Implication for Potential Participants

Potential partners should be aware of the large number of problems they can encounter in a collaborative project. Some participants reported that they were not conscious of the quantity of small details that need to be considered when collaboration occurs. Sometimes, it is not the big problems, but the small ones that cause the major number of headaches, and they recommended that huge quantities of small details needed to be addressed.

At the individual level potential participants in a collaborative project could suffer from work overload, stress, negative attitudes, personal conflict, frustration, a great deal of bad feelings, different points of view, and their family life could be affected. It is expected that participants should be able to do their actual job plus the new

responsibilities, and they will have due dates for some of those activities.

Additionally, they could confront problems with technology and supposed experts that are not experts. In some committees, there are members that in theory are experts in x, y, and z, but when the real problems arrive they are not able to produce any viable solutions. Sometimes in the middle of the road, partners could discover that the expert suggested a solution that does not satisfy all their needs, but they cannot do anything about it because that solution was partially implemented, and it is not cost-effective to make changes at that stage.

Sometimes, potential partners require being aware that they need to learn one or several of the following: learn about their partners, learn about the project, learn about specific tasks, learn their cultural differences, and learn new skills. They will need to develop and nurture a relationship. This relationship could involve different personalities, different mindsets, and probably the use of different vocabulary. Also, they will have to adapt to their partners and accept their differences.

Lack of commitment and lack of coordination could be great obstacles in the development of a collaborative project. However, the opposite could happen. There may be a small probability of achieving success without having too many problems.

Implications for Funders

Funders should constantly assess whether some of their requirements are realistic. There were some complaints about the bureaucratic process: specifically, the quantity of paperwork needed, the number of committees, and the high number of meetings required by funding agencies. Some people suggested that it would be great to have a set of templates to facilitate the paperwork. It may be that some of these

recommendations have already been implemented since some of the participants in this research were funded in 1998 and 1999.

Participants in the funded projects said that they needed to honor the terms of the grant. Abandoning or finishing a project without satisfying the terms is not an option because the consequences might be no more funding for their organizations in the future. However, it might be convenient to look for alternatives in extreme cases of conflict in collaborative projects. Even relationships that start with love may finish in divorce. It will be suitable to learn more about the complexities of collaboration, and when things go really wrong there is an opportunity to learn. Funding agencies need to define when the terms of the grant must be honored even if it means inefficient use of resources.

One of the biggest problems in collaborative projects between museums and libraries is cultural differences, and the first step to find solutions to some of the problems listed here is to identify what it is happening, which requires the development of a fast feedback mechanism. Reliable feedback will help to improve guidelines, and the decision-making process.

Some Reflections

Collaboration is a multidimensional, dynamic process, in which partners share vision, objectives, authority, decision-making, responsibilities, results, and resources. There is not a single perspective that can explain this complex problem. Additionally, the real experience of collaboration is difficult to bring to the lab; it is not possible to control this phenomenon. Researchers of this problem have to be flexible and adapt to changing situations, and their designs should be robust enough to suffer modifications.

Also, the researcher requires skills that allow movement in an environment with uncertainty, personal interest, conflict, and power issues, which may complicate validity of findings.

Many problems need to be addressed: there is not a common language among researchers; multiple disciplines have different approaches and vocabularies; everybody has had an experience in collaboration, but that does not make them an expert. Collaboration is not a panacea, there are negative aspects, such as corruption and abuse of trust; miscommunication may be present over all at the beginning of the project.

This research provided a framework based on a holistic and multidisciplinary point of view. However, many aspects are outside of this framework – leadership, cultural differences, dynamic issues, different levels of collaboration, and characteristics of the environment that foster or harm collaboration among others. This study provided an initial look at a possible direction that allowing for understanding the nature of collaboration.

Future Studies

Instruments to measure each one of the factors that affect collaboration, to understand and know how they vary over the time, interact among them, and what conditions affect them need to be developed. Collaboration needs to be studied on different levels, including interpersonal, group, organization, and in different environments. Both tasks could help to create a better understanding of the elements, situation, and conditions that affect collaboration. The generic stages of collaboration must be defined and studied in detail. Also, research is needed to define the different

roles that collaborators play in the process of collaboration: For example, the roles of liaisons and bridges from organizational communication, the roles of experts and negotiators. At same time, practitioners need to understand the collaborative phenomenon, and heuristic methods will need to be developed to address the practitioners' needs. Finally, but not last, theory is needed to provide direction and structure to the collaboration problem.

Some issues that reserve more study using multidimensional scaling are to identify how the relationships among the variables are affected by the different roles of the collaborators, the experts, the negotiators, regression of some variable to find new vectors in which the variables could have relationships, and rotations of axis. Additionally, different types of commitment in an organization and what the relationships between commitment and coordination are.

From the results of this study, it is clear that the next study needs to incorporate the variables identified in the interview data.

Summary

This research studied collaborative projects granted by IMLS with 54 participants from 25 different projects. The results suggest that the operationalization of some concepts is appropriate: trustworthiness, competence, interdependency, complexity, and conflict. In addition, the outcomes in this study suggest relationships between commitment, coordination and integration, but the relationships present some possible inconsistencies that will require further research. The results from multidimensional scaling produced a map that allows the identification of some direction in which the concepts define specific regions and possible dual relationships. These results suggest

that the level of partners' commitment in a collaborative effort could be related with the level of relevant information that partners exchange. Some of the dual relationships are evident, but others require further research. Although, five stages of collaboration are identified by 84% of the participants, the outcomes imply that there are circumstances that may affect the number of stages in a collaborative process, such as type of project, which could present different levels of complexity.

APPENDIX A
QUESTIONNAIRE

Name:

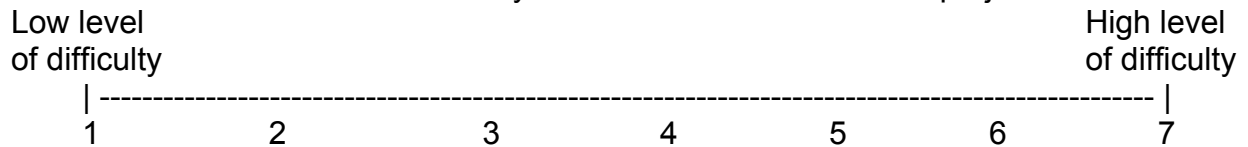
Your Organization's name:

The following 15 questions and subsections are only related to the collaborative project in which you participated. Please read each question, and then indicate your opinion by selecting a number (1 = low, 7 = high).

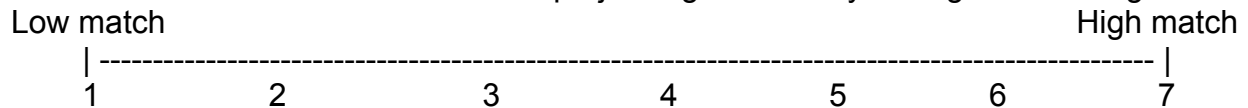
1. How much change in technology impact your work in the collaborative project?



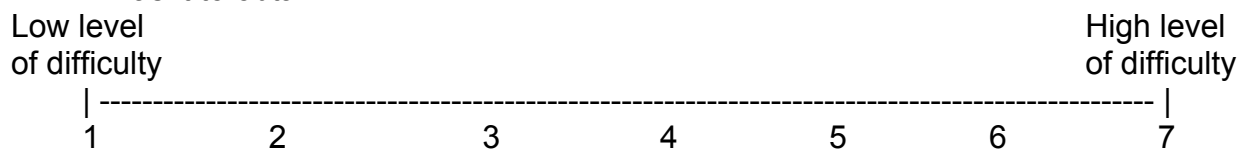
2. What was the level of difficulty involved in the collaborative project?



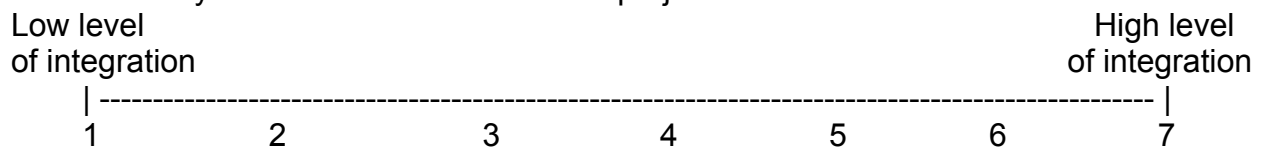
3. How much did the collaborative project's goals meet your organizational goals?

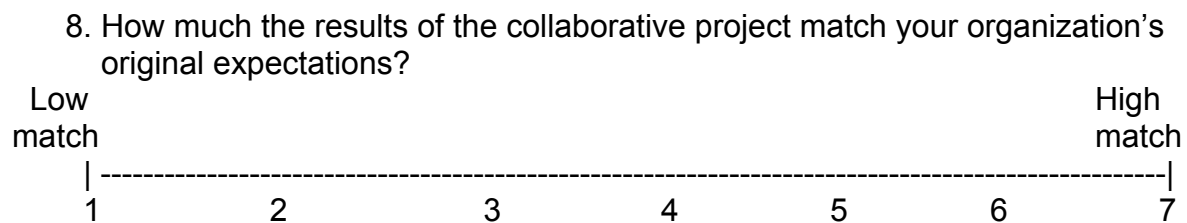
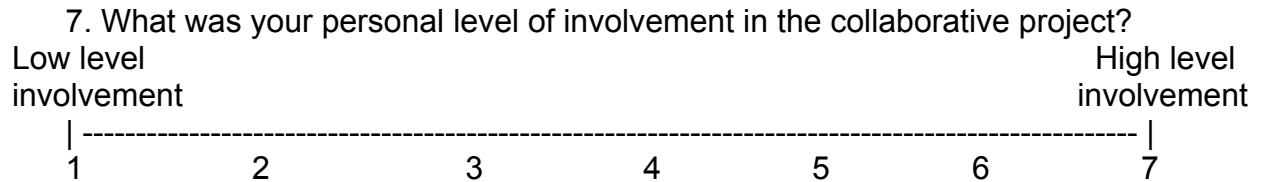
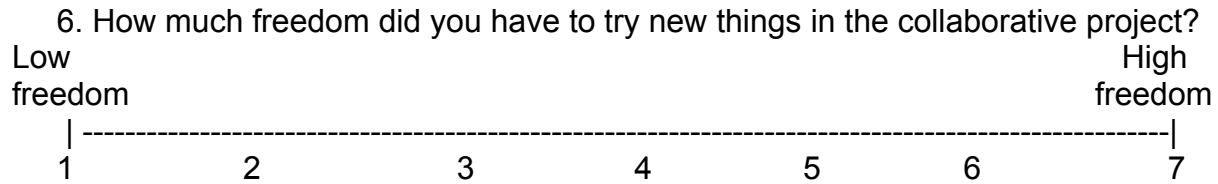


4. When you needed information from your partner organization(s), how difficult was it to obtain?

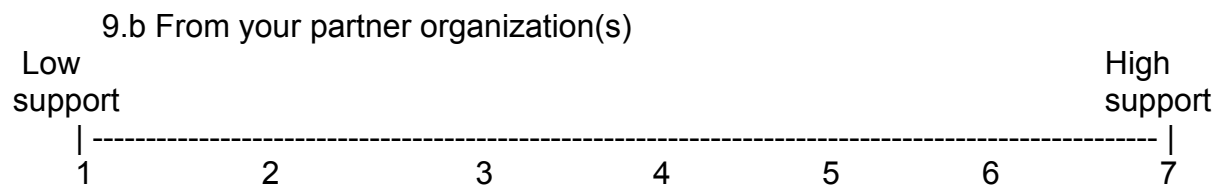
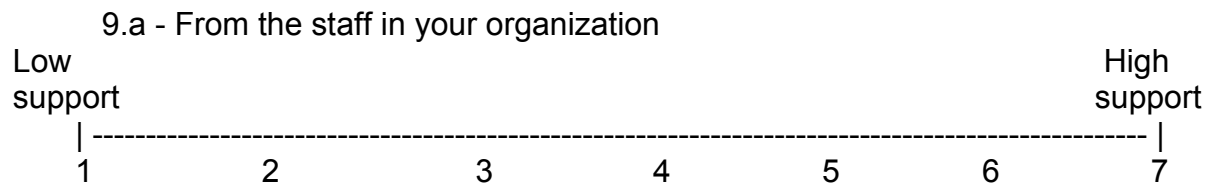


5. What was the level of integration achieved between (among) the organizations as they worked on the collaborative project?





9. How much support did you get to achieve the goals of the collaborative project?



10. Several factors with definitions are listed below. Please indicate how significant each of the following factors has been in the decision-making process in your collaborative effort by selecting a number (1 = Not significant, 7 = very significant).

10.a Trustworthiness

Trustworthiness is the participants' level of reliability, reciprocity, and qualification in the collaborative relationship.



10.b Commitment

Commitment is the participants' level of compromise or responsibility to stick to the objective, and it is expressed as support, prioritization of common goals, and the supply of resources by partners.



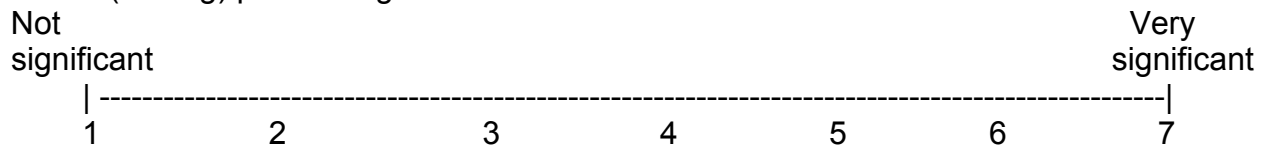
10.c Competence

Competence is the participants' level of adaptability, expertise, creativity, and capacity to solve unpredicted problems in the collaborative relationship.



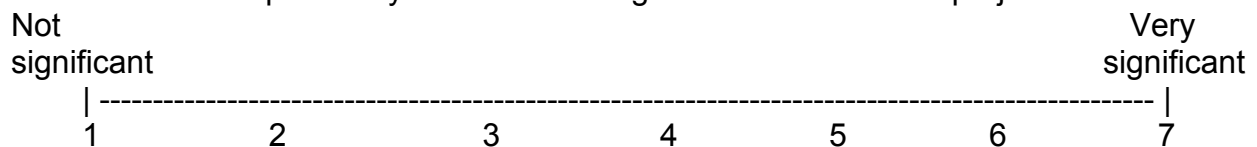
10.d Conflict

Conflict is a divergence on needs, expectations, interests, and ideas between (among) partner organizations.



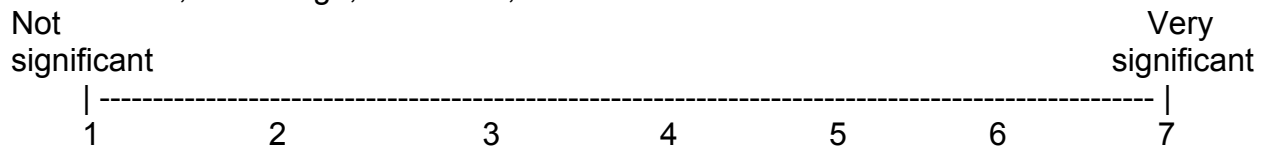
10.e Risk

Risk is the possibility of loss or damage in the collaborative project.



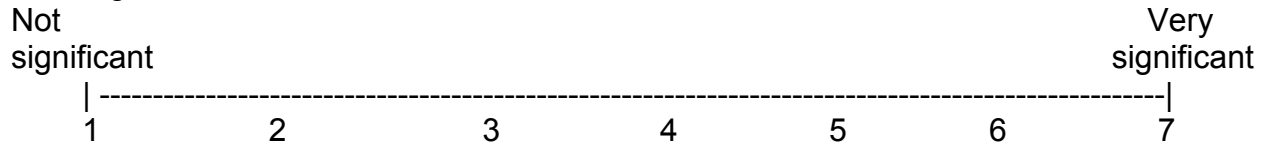
10.f Interdependence

Interdependence is the condition of depending upon each partner organizations' skills, knowledge, resources, and work.



10.g Coordination

Coordination is the harmonization of all activities to achieve the collaborative goals.



10.h Complexity

Complexity is made up of interrelated dynamic parts in a collaborative relationship.



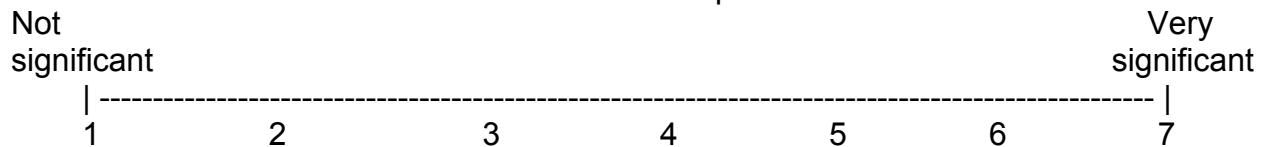
10.i Integration

Integration is the level of unity achieved between (among) partner organizations.



10.j Uncertainty

Uncertainty is the state of indefinability of the future, tasks, partners and the environment in the collaborative relationship.



11. Several possible challenges between members of collaborative organizations are listed below. Please indicate the impact on performance that challenges may have made by selecting a number. If you think that a challenge does not apply to your partner organization(s), do not select it (1 = low, 7 = high).

11.a Different points of view about how to achieve the collaborative goals



11.b Different interests



11.c Different expectations
Low impact |-----| high impact
1 2 3 4 5 6 7

11.d Different needs
Low impact |-----| high impact
1 2 3 4 5 6 7

11.e Other challenge, please list:
Low impact |-----| high impact
1 2 3 4 5 6 7

11.f Other challenge, please list:
Low impact |-----| high impact
1 2 3 4 5 6 7

11.g Other challenge, please list:
Low impact |-----| high impact
1 2 3 4 5 6 7

11.h Other challenge, please list:
Low impact |-----| high impact
1 2 3 4 5 6 7

12. Listed below, there are some factors that suggest dependency between (among) organizations. Please select a number, and indicate how much your organization depended on it.

12.a the skills of your partner organization(s)
Low dependency |-----| high dependency
1 2 3 4 5 6 7

12.b the knowledge of your partner organization(s)
Low dependency |-----| high dependency
1 2 3 4 5 6 7

12.c the resources of your partner organization(s)

Low dependency high dependency

|-----|

1 2 3 4 5 6 7

12.d the work of your partner organization(s)

Low dependency high dependency

|-----|

1 2 3 4 5 6 7

13. Several actions are listed below. Please indicate how frequently your organization used the following actions to coordinate activities in the collaborative project by selecting a number. If you think that an action does not apply, do not select it (1 = infrequently, 7 = frequently).

13.a A set of routines

Infrequently Frequently

|-----|

1 2 3 4 5 6 7

13.b Standard procedures defined by agreement

Infrequently Frequently

|-----|

1 2 3 4 5 6 7

13.c Revision of the collaborative project plan

Infrequently Frequently

|-----|

1 2 3 4 5 6 7

13.d Mutual agreements

Infrequently Frequently

|-----|

1 2 3 4 5 6 7

13.e Other action, please list:

Infrequently Frequently

|-----|

1 2 3 4 5 6 7

13.f Other action, please list:

Infrequently Frequently

|-----|

1 2 3 4 5 6 7

13.g Other action, please list:

Infrequently |-----| Frequently

1 2 3 4 5 6 7

13.h Other action, please list:

Infrequently |-----| Frequently

1 2 3 4 5 6 7

14. Several characteristics are listed below. Please indicate how much each of the characteristics applies to your partner organization(s) by selecting a number. If you think that a characteristic does not apply, do not select it.

14.a Level of expertise shown in the collaborative project

Low expertise |-----| High expertise

1 2 3 4 5 6 7

14.b Level of creativity to find new solutions

Low creativity |-----| High creativity

1 2 3 4 5 6 7

14.c Ability to solve unpredicted problems

Low ability |-----| High ability

1 2 3 4 5 6 7

14.d Maintenance of good inter-organizational relationships

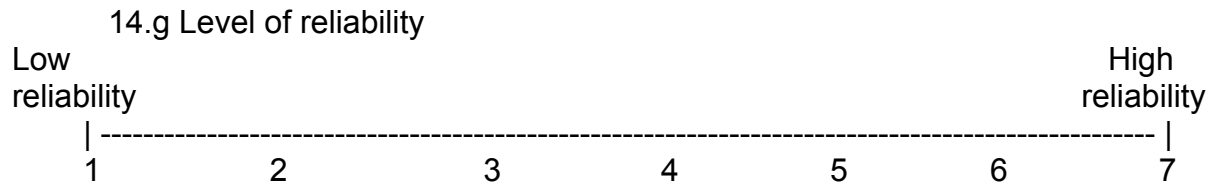
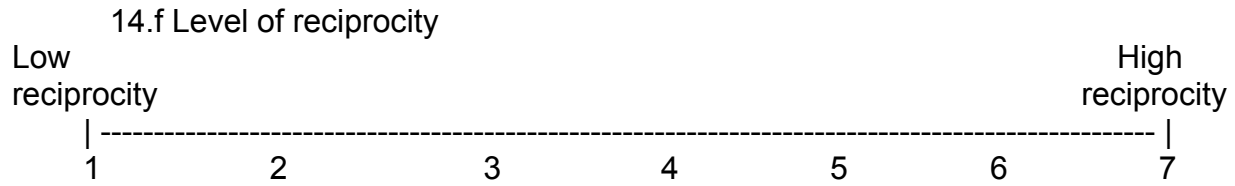
Poor relationships |-----| High relationships

1 2 3 4 5 6 7

14.e Level of adaptability

Low adaptability |-----| High adaptability

1 2 3 4 5 6 7



15. Please, check all stages below that were part of your collaborative project.

15. a Networking stage

In the networking stage, partner organizations carry out small exchanges of information or favors among individuals or groups from different organizations at the beginning of the collaborative project.

15. b Definition stage

In the definition stage, the parties develop all or some of the following: joint vision, objectives, goals, agreements, identify alternatives, costs, investment and resources needed, and define rules and obligations for future actions by negotiation.

15.c Execution stage

In the execution stage, partners carry out the activities to achieve their vision and their objectives. At the same time, there is a learning process about what works and what does not.

15. d Relationship stage

In the relationship stage, relationships between partner organizations are developed incrementally. Relationships can be formal and/or informal, and they start with small informal exchanges. As the relationship develops, each partner organization learns about each other, and organizations achieve some level of integration over time.

15. e Partner's evaluation stage

In the partner's evaluation stage, each organization is evaluating informally the benefits and costs they are receiving from the collaborative project based on its own expectations.

15. f Common evaluation stage

In the common evaluation stage, partner organizations evaluate together the progress of the collaborative project.

15. g Conflict stage

Conflict stage is the result of misunderstandings, change of expectations, differences of opinion, external pressures, and others between (among) the partner organizations.

15. h 'Redefinition of conditions' stage

In the 'redefinition of conditions' stage, misunderstandings and external changes force adjustment of the collaborative objectives and agreements to adapt to new conditions.

15. i End of collaboration stage

End of collaboration stage is the dissolution of the collaborative effort.

15. j Other stage. Please specify:

15. k Other stage. Please specify:

15. l Other stage. Please specify:

Would you like to participate in a telephone interview to explore in more detail some of these factors and stages? (time required about 20 minutes)

Yes No

If your answer for the previous question was affirmative, would you provide me a telephone number where I can contact you?

Thank you very much.

APPENDIX B
NAMES OF THE VARIABLES

R1: Technological impact in the collaborative project

R2: Level of difficulty in the collaborative project

R3: Project's goals match organizational goals

R4: Difficulty to obtain information

R5: Level of integration achieved

R6: Freedom to try new things

R7: Your personal level of involvement

R8: Project results match original expectations

R9A: Support from the staff in your organization

R9B: Support from your partner organization

R11A: Different points of view

R11B: Different interests

R11C: Different expectations

R11D: Different needs

R12A: Dependency on your partners' skills

R12B: Dependency on your partners' knowledge

R12C: Dependency on your partners' resources

R12D: Dependency on your partners' work

R13A: Coordination by a set of routines

R13B: Coordination using standard procedures defined by agreement

R13C: Coordination by revising the collaborative plan

R13D: Coordination by mutual agreement

R14A: Partners' expertise

R14B: Partners' creativity to find new solutions

Names of the variable

R14C: Partners' ability to solve unpredicted problems

R14D: Partners' capacity to good inter-organizational relationships

R14E: Partners' adaptability

R14F: Partners' reciprocity

R14G: Partners' reliability

APPENDIX C
DESCRIPTIVE STATISTICS

Table 15

Descriptive Statistics

Variable	N	Mean	Std. Deviation	Variance	Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
R1	50	4.62	2.10	4.404	-0.534	-1.016
R2	50	4.74	1.87	3.502	-0.753	-0.674
R3	50	5.94	1.17	1.364	-1.081	1.101
R4	50	3.06	1.90	3.609	0.450	-1.098
R5	50	4.86	1.65	2.735	-0.360	-0.774
R6	50	5.18	1.69	2.844	-0.561	-0.898
R7	50	5.80	1.63	2.653	-1.198	0.274
R8	50	5.70	1.20	1.439	-1.013	0.929
R9A	50	5.40	1.94	3.755	-0.806	-0.877
R9B	50	5.56	1.57	2.456	-0.977	0.208
R10A	50	6.08	1.21	1.463	-2.033	5.640
R10B	50	6.18	1.06	1.130	-1.755	3.915
R10C	50	6.08	1.08	1.177	-1.363	1.368
R10D	50	3.90	1.72	2.949	.0186	-0.906
R10E	50	3.22	1.64	2.706	0.492	-0.452
R10F	50	5.42	1.58	2.493	-1.289	1.278
R10G	50	5.78	1.04	1.073	-0.799	-0.010
R10H	50	5.42	1.37	1.881	-0.468	-0.759
R10I	50	5.48	1.39	1.928	-1.124	1.303
R10J	50	4.06	1.72	2.956	-0.222	-0.471
R11A	50	3.80	2.17	4.694	-0.120	-0.983
R11B	50	3.68	2.24	4.998	0.066	-1.232
R11C	50	3.82	2.13	4.518	0.046	-1.115
R11D	50	3.74	2.06	4.237	-0.132	-0.913
R12A	50	5.52	1.53	2.336	-1.450	1.631
R12B	50	5.46	1.50	2.253	-1.221	1.277
R12C	50	5.48	1.80	3.234	-1.293	0.784
R12D	50	5.46	1.53	2.335	-0.976	0.525
R13A	50	4.04	2.17	4.692	-0.530	-0.799
R13B	50	4.48	1.94	3.765	-0.405	-1.023
R13C	50	3.42	2.17	4.698	0.007	-1.223
R13D	50	5.14	1.86	3.470	-1.081	0.530
R14A	50	5.88	1.26	1.577	-1.310	1.377
R14B	50	5.36	1.71	2.929	-1.252	0.891
R14C	50	5.30	1.68	2.827	-1.060	0.284
R14D	50	5.72	1.68	2.818	-1.640	2.117
R14E	50	5.32	1.65	2.712	-0.853	-0.153
R14F	50	5.12	1.83	3.332	-1.086	0.495
R14G	50	5.46	1.73	2.988	-1.498	1.743
Valid N	50					

APPENDIX D
SEQUENCE OF CLUSTERING

Table 16

Sequence of Clustering for Dendrogram in Figure 7

Stage	Variables clustered	Coefficients*
1	R14B, R14C	15.500
2	R12A, R12B	34.000
3	R10C, R10G	55.500
4	R14F, R14G	82.000
5	R3, R8	110.000
6	R11C, R11D	140.000
7	R10A, R10B	170.500
8	R14D, R14E	206.500
9	R10A, R10B, R10C, R10G	245.500
10	R12C, R12D	286.000
11	R11A, R11B	334.000
12	R10H, R10I	383.500
13	R14A, R10A, R10B, R10C, R10G	440.900
14	R9B, R3, R8	504.900
15	R14F, R14G, R14D, R14E	569.650
16	R5, R6	640.650
17	R12C, R12D, R12A, R12B	715.650
18	R10F, R10H, R10I	796.817
19	R11A, R11B, R11C, R11D	878.317
20	R14B, R14C, R14F, R14G, R14D, R14E	959.900
21	R10D, R10E	1055.900
22	R13D, R5, R6	1152.900
23	R1, R2	1260.900
24	R14A, R10A, R10B, R10C, R10G, R10F, R10H, R10I	1369.583
25	R10J, R10D, R10E	1486.250
26	R9B, R3, R8, R13D, R5, R6	1608.417
27	R4, R10J, R10D, R10E	1747.750
28	R7, R14A, R10A, R10B, R10C, R10G, R10F, R10H, R10I	1888.667
29	R9A, R7, R14A, R10A, R10B, R10C, R10G, R10F, R10H, R10I	2042.600
30	R13B, R9B, R3, R8, R13D, R5, R6	2207.005
31	R13C, R4, R10J, R10D, R10E	2377.805
32	R13A, R13C, R4, R10J, R10D, R10E	2611.171
33	R1, R2, R13A, R13C, R4, R10J, R10D, R10E	2853.880
34	R9A, R7, R14A, R10A, R10B, R10C, R10G, R10F, R10H, R10I, R12C, R12D, R12A, R12B	3097.708
35	R13B, R9B, R3, R8, R13D, R5, R6, R14B, R14C, R14F, R14G, R14D, R14E	3384.496
36	R1, R2, R13A, R13C, R4, R10J, R10D, R10E, R11A, R11B, R11C, R11D	3710.204
37	R13B, R9B, R3, R8, R13D, R5, R6, R14B, R14C, R14F, R14G, R14D, R14E, R9A, R7, R14A, R10A, R10B, R10C, R10G, R10F, R10H, R10I, R12C, R12D, R12A, R12B	4064.824
38	All variables	6204.975

*Coefficients: Squared Euclidian Distance among Variables

Table 17

Sequence of Clustering for Dendrogram in Figure 8

Stage	Variables clustered	Coefficients*
1	R14B, R14C	15.500
2	R12A, R12B	34.000
3	R14F, R14G	60.500
4	R3, R8	88.500
5	R11C, R11D	118.500
6	R14D, R14E	154.500
7	R12C, R12D	195.000
8	R11A, R11B	243.000
9	R14A, R14D, R14E	305.000
10	R9B, R3, R8	369.000
11	R14A, R14D, R14E, R14B, R14C	439.900
12	R5, R6	510.900
13	R12C, R12D, R12A, R12B	585.900
14	R11A, R11B, R11C, R11D	667.400
15	R14A, R14D, R14E, R14B, R14C, R14F, R14G	753.071
16	R13D, R5, R6	850.071
17	R1, R2	958.071
18	R9B, R3, R8, R13D, R5, R6	1080.238
19	R7, R9B, R3, R8, R13D, R5, R6	1221.214
20	R9, R7, R9B, R3, R8, R13D, R5, R6	1380.697
21	R13A, R13B	1545.697
22	R4, R13C	1728.697
23	R1, R2, R4, R13C	1944.197
24	R9, R7, R9B, R3, R8, R13D, R5, R6, R13A, R13B	2210.271
25	R11A, R11B, R11C, R11D, R1, R2, R4, R13C	2516.771
26	R14A, R14D, R14E, R14B, R14C, R14F, R14G, R12C, R12D, R12A, R12B	2856.200
27	R14A, R14D, R14E, R14B, R14C, R14F, R14G, R12C, R12D, R12A, R12B, R9, R7, R9B, R3, R8, R13D, R5, R6, R13A, R13B	3227.929
28	All variables	4834.138

*Coefficients: Squared Euclidian Distance among Variables

APPENDIX E
RELIABILITY ANALYSIS

Reliability Analysis for Cluster 1 in Figure 7

Method 2 (covariance matrix) will be used for this analysis

RELIABILITY ANALYSIS – SCALE (ALPHA)

N of Cases = 50.0

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	5.3800	5.1200	5.7200	0.6000	1.1172	0.0400
Item Variances	Mean	Minimum	Maximum	Range	Max/Min	Variance
	2.9343	2.7118	3.3322	0.6204	1.2288	0.0472
Inter-Item Correlations	Mean	Minimum	Maximum	Range	Max/Min	Variance
	0.7023	0.5976	0.8909	0.2933	1.4907	0.0066

Item-total Statistics

	Scale Mean If Item Deleted	Scale Variance If Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha If Item Deleted
R14B	26.9200	55.8302	0.8066	0.8236	0.9214
R14C	26.9800	56.2241	0.8067	0.8223	0.9214
R14D	26.5600	56.4147	0.7933	0.7292	0.9223
R14E	26.9600	56.7739	0.8020	0.7566	0.9221
R14F	27.1600	53.7290	0.8344	0.8305	0.9179
R14G	26.8200	56.1914	0.7798	0.7868	0.9248

Reliability Coefficients 6 items

Alpha = 0.9339

Standardized item alpha = 0.9340

Reliability Analysis for Cluster 1 in Figure 7

Method 2 (covariance matrix) will be used for this analysis

RELIABILITY ANALYSIS – SCALE (ALPHA)

N of Cases = 50.0

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	5.6750	5.4000	5.9400	0.5400	1.1000	0.0582
Item Variances	Mean	Minimum	Maximum	Range	Max/Min	Variance
	2.5568	1.3637	3.7551	2.3914	2.7537	0.9597
Inter-Item Correlations	Mean	Minimum	Maximum	Range	Max/Min	Variance
	0.1785	-0.1551	0.4091	0.5642	-2.6372	0.0445

Item-total Statistics

	Scale Mean If Item Deleted	Scale Variance If Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha If Item Deleted
R3	16.7600	8.9616	0.6146	0.4007	0.0164
R9A	17.3000	8.4184	0.2178	0.1329	0.3468
R9B	17.1400	10.6127	0.1522	0.2620	0.4015
R7	16.9000	11.4796	0.0444	0.2192	0.5103

Reliability Coefficients 4 items

Alpha = 0.4008

Standardized item alpha = 0.4650

Reliability of Mechanism of Coordination

Method 2 (covariance matrix) will be used for this analysis

RELIABILITY ANALYSIS SCALE (ALPHA)

1. R13A
2. R13B
3. R13C
4. R13D

N of Cases = 50.0

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	4.2700	3.4200	5.1400	1.7200	1.5029	0.5255
Item Variances	Mean	Minimum	Maximum	Range	Max/Min	Variance
	4.1561	3.4698	4.6976	1.2278	1.3538	0.4016
Inter-item Correlations	Mean	Minimum	Maximum	Range	Max/Min	Variance
	0.1906	0.0694	0.3819	0.3125	5.5038	0.0122

Item-total Statistics

	Scale Mean If Item Deleted	Scale Variance If Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha If Item Deleted
R13A	13.0400	16.7739	0.2506	0.0923	0.4330
R13B	12.6000	16.8571	0.3320	0.1883	0.3557
R13C	13.6600	17.1678	0.2253	0.0738	0.4579
R13D	11.9400	17.6494	0.3062	0.1724	0.3820

Reliability Coefficients 4 items

Alpha = 0.4779

Standardized item alpha = 0.4851

Reliability for Positive Significance Variables

Method 2 (covariance matrix) will be used for this analysis

RELIABILITY ANALYSIS - SCALE (ALPHA)

N of Cases = 50.0

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	5.7771	5.4200	6.1800	0.7600	1.1402	0.1149
Item Variances	Mean	Minimum	Maximum	Range	Max/Min	Variance
	1.5923	1.0731	2.4935	1.4204	2.3237	0.2801
Inter-Item Correlations	Mean	Minimum	Maximum	Range	Max/Min	Variance
	0.4165	0.1990	0.6693	0.4703	3.3629	0.0191

Item-total Statistics

	Scale Mean If Item Deleted	Scale Variance If Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha If Item Deleted
R10A	34.3600	27.3371	0.7086	0.5899	0.7749
R10B	34.2600	30.4004	0.5315	0.3846	0.8046
R10C	34.3600	30.1127	0.5435	0.4489	0.8027
R10F	35.0200	26.8363	0.5154	0.3643	0.8131
R10G	34.6600	28.8820	0.7011	0.5891	0.7815
R10H	35.0200	30.3057	0.3692	0.2375	0.8331
R10I	34.9600	26.0800	0.6877	0.5567	0.7759

Reliability Coefficients 7 items

Alpha = 0.8223 Standardized item alpha = 0.8332

Reliability Negative Significance Variables

Method 2 (covariance matrix) will be used for this analysis

RELIABILITY ANALYSIS - SCALE (ALPHA)

N OF cases = 50.0

Item Means	Means	Minimum	Maximum	Range	Max/Min	Variance
	3.7267	3.2200	4.0600	0.8400	1.2609	0.1989
Item Variance	Mean	Minimum	Maximum	Range	Max/Min	Variance
	2.8701	2.7057	2.9555	0.2498	1.0923	0.0203
Inter-item Correlations	Mean	0.2302	0.3909	0.1607	1.6980	0.0052
	0.3161					

Item-total Statistics

	Scale Mean If Item Deleted	Scale Variance If Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha If Item Deleted
R10D	7.2800	7.5118	0.3790	0.1645	0.4927
R10E	7.9600	7.2637	0.4578	0.2122	0.3742
R1-J	7.1200	7.8629	0.3329	0.1194	0.5617

Reliability Coefficients 3 items

Alpha – 0.5793 Standardized item alpha = 0.5810

Reliability of Trustworthiness

Method 2 (covariance matrix) will be used for this analysis

RELIABILITY ANALYSIS – SCALE (ALPHA)

1. R14B
2. R14C
3. R14D
4. R14E
5. R14A
6. R14F
7. R14G

N of Cases = 50.0

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	5.4514	5.1200	5.8800	0.7600	1.1484	0.0690
Item Variances	Mean	Minimum	Maximum	Range	Max/Min	Variance
	2.7404	1.5771	3.3322	1.7551	2.1128	0.3024
Inter-item Correlations	Mean	Minimum	Maximum	Range	Max/Min	Variance
	0.6557	0.4490	0.8909	0.4419	1.9842	0.0109

Item-total Statistics

	Scale Mean If Item Deleted	Scale Variance If Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlations	Alpha If Item Deleted
R14B	32.8000	68.6939	0.8195	0.8327	0.9161
R14C	32.8600	69.3473	0.8106	0.8225	0.9170
R14D	32.4400	69.6392	0.8000	0.7324	0.9180
R14E	32.8400	70.0147	0.8036	0.7577	0.9177
R14A	32.2800	79.3894	0.6213	0.4248	0.9339
R14F	33.0400	66.7331	0.8318	0.8338	0.9150
R14G	32.7000	69.7245	0.7676	0.7891	0.9213

Reliability Coefficients 7 items

Alpha = 0.9308 Standardized item alpha = 0.9302

Reliability of Competence

Method 2 (covariance matrix) will be used for this analysis

RELIABILITY ANALYSIS – SCALE (ALPHA)

1. R14A
2. R14B
3. R14C
4. R14D
5. R14E

N of Cases = 50.0

Item Means	Mean 5.5160	Minimum 5.3000	Maximum 5.8800	Range 0.5800	Max/Min 1.1094	Variance 0.0709
Item Variances	Mean 2.5725	Minimum 1.5771	Maximum 2.9290	Range 1.3518	Max/Min 1.8571	Variance 0.3155
Inter-item Correlations	Mean 0.6604	Minimum 0.5355	Maximum 0.8909	Range 0.3553	Max/Min 1.6635	Variance 0.0115

Item-total Statistics

	Scale Mean If Item Deleted	Scale Variance If Item Deleted	Corrected Item- Total Correlation	Squared Multiple Correlation	Alpha If Item Deleted
R14A	21.7000	35.8878	0.6299	0.4135	0.9141
R14B	22.2200	28.6649	0.8375	0.8251	0.8713
R14C	22.2800	28.9812	0.8361	0.8220	0.8716
R14D	21.8600	29.9188	0.7736	0.6527	0.8857
R14E	22.2600	30.2371	0.7727	0.6645	0.8857

Reliability Coefficients 5 items

Alpha = 0.9075 Standardized item alpha = 0.9068

Reliability Dependency

Method 2 (covariance matrix) will be used for this analysis

RELIABILITY ANALYSIS – SCALE (ALPHA)

N OF cases = 50.0

Item means	Mean 5.4800	Minimum 5.4600	Maximum 5.5200	Range 0.600	Max/Min 1.0110	Variance .00008
Item Variance	2.5398	2.2535	3.2343	0.9808	1.4352	0.2159
Inter-item Correlation	Mean 0.6499	Minimum 0.5458	Maximum 0.8364	Range 0.2906	Max/Min 1.5324	Variance 0.0107

Item-total Statistics

	Scale Mean If Item Deleted	Scale Variance If Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha If Item Deleted
R12A	16.4000	17.5918	0.7627	0.7226	0.8330
R12B	16.4600	17.7637	0.7658	0.7183	0.8324
R12C	16.4400	16.4963	0.6830	0.5359	0.8703
R12D	16.4600	17.7229	0.7500	0.5923	0.8378

Reliability Coefficients 4 items

Alpha= 0.8774 Standardized item alpha = 0.8813

Reliability of Conflict

Method 2 (covariance matrix) will be used for this analysis

RELIABILITY ANALYSIS – SCALE (ALPHA)

N of Cases = 50.0

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	3.7600	3.6800	3.8200	0.1400	10.380	0.0040
Item Variances	Mean	Minimum	Maximum	Range	Max/Min	Variance
	4.6116	4.2371	4.9976	0.7604	1.1795	0.1016
Inter-item Correlations	Mean	Minimum	Maximum	Range	Max/Min	Variance
	0.7665	0.6837	0.8613	0.1777	1.2598	0.0034

Item-total Statistics

	Scale Mean If Item Deleted	Scale Variance If Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha If Item Deleted
R11A	11.2400	35.5739	0.7950	0.6683	0.9201
R11B	11.3600	33.7861	0.8477	0.7314	0.9029
R11C	11.2200	34.6649	0.8643	0.7899	0.8973
R11D	11.3000	36.0510	0.8304	0.7579	0.9088

Reliability Coefficients 4 items

Alpha = 0.9289 Standardized item alpha = 0.9292

Reliability of Complexity

Method 2 (covariance matrix) will be used for this analysis

RELIABILITY ANALYSIS – SCALE (ALPHA)

N of Cases = 50.0

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	4.6800	4.6200	4.7400	0.1200	1.0260	0.0072
Item Variances	Mean	Minimum	Maximum	Range	Max/Min	Variance
	0.4472	0.4472	0.4472	.0000	1.0000	.0000

Item-total Statistics

	Scale Mean If item Deleted	Scale Variance If item Deleted	Corrected Item- Total Correlation	Squared Multiple Correlation	Alpha If Item Deleted
R1	4.7400	3.5024	0.4472	0.2000	-
R2	4.6200	4.4037	0.4472	0.2000	-

Reliability Coefficients 2 items

Alpha = 0.6152 Standardized item alpha = 0.6180

APPENDIX F
DIMENSIONS FOR MDS AND GOODNESS OF FIT

Table 18

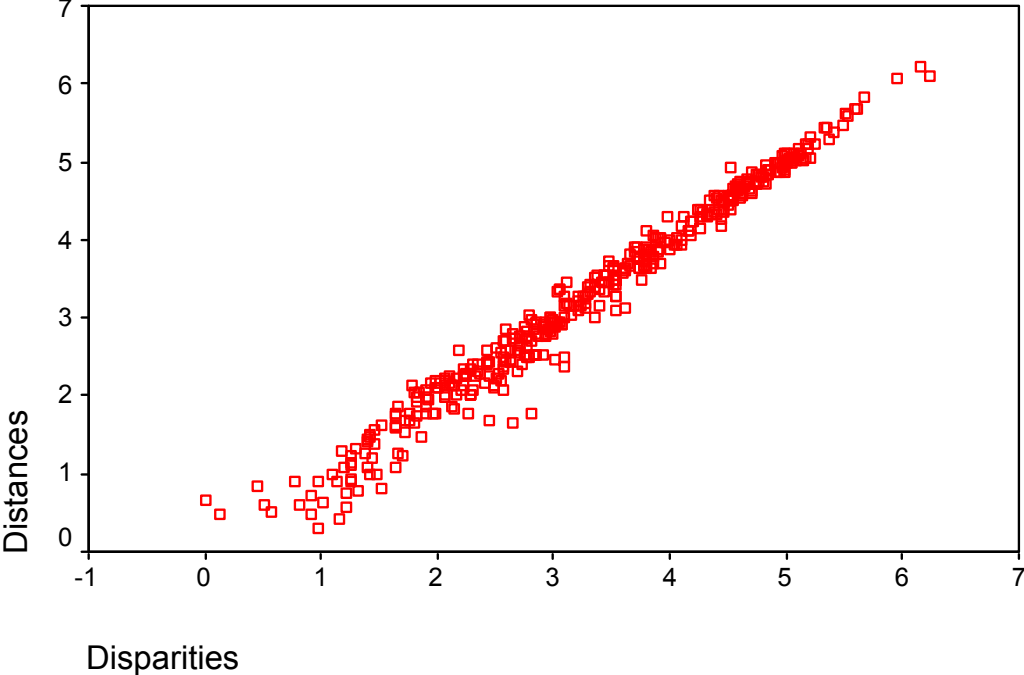
Dimensions for MDS

Variable	Dim1	Dim2	Dim3	Distance
R1	1.0107	0.307	-0.8357	1.346907
R2	1.1845	-0.8133	-0.9267	1.709757
R3	-1.2836	-0.1594	-0.4623	1.373593
R4	3.1212	-0.9683	-0.4566	3.299694
R5	-0.5232	0.6358	-0.1422	0.835584
R6	-0.6089	0.6394	-0.3759	0.959631
R7	-0.827	-0.5079	-1.134	1.492598
R8	-1.0454	0.1473	-0.4398	1.143671
R9A	-0.7862	-1.0577	-0.2006	1.333072
R9B	-1.4541	0.3276	0.2	1.503904
R11A	2.4135	-0.0822	0.5431	2.475216
R11B	2.7112	-0.346	-0.1645	2.738135
R11C	2.5895	-0.4179	0.5664	2.68346
R11D	2.5153	-0.269	0.7672	2.643424
R12A	-0.95	-0.7451	0.2478	1.232509
R12B	-0.783	-0.6466	0.375	1.0825
R12C	-0.9788	-0.8609	0.7687	1.513307
R12D	-0.8515	-0.5858	0.5291	1.161103
R13A	0.9073	1.7334	0.6598	2.064753
R13B	0.1153	0.9638	-1.0776	1.450319
R13C	2.2539	1.4427	0.0903	2.677611
R13D	-0.6433	0.1327	-0.7641	1.007617
R14A	-1.1446	-0.4554	0.1699	1.243529
R14B	-0.8927	0.3556	0.357	1.025092
R14C	-0.9343	0.3185	0.159	0.99982
R14D	-1.5987	0.021	0.0196	1.598958
R14E	-1.0815	0.3778	0.2913	1.182045
R14F	-1.098	0.537	0.5891	1.356839
R14G	-1.3378	-0.0242	0.6466	1.486064

Figure 15. Scatterplot of Linear Fit Euclidean Distance Model

Scatterplot of Linear Fit

Euclidean distance model



APPENDIX G
CORRELATIONS OF VARIABLES

Table 19

Nonparametric Correlations - Spearman's rho N = 50

		R1	R2	R3	R4	R5	R6	R7
R1	Cor. Coef.	1	.442**	-0.035	0.298*	0.168	0.229	0.346*
	Sig. (2-tailed)		0.001	0.809	0.035	0.243	0.11	0.014
R2	Cor. Coef.	0.442**	1	-0.218	.550**	-0.192	0.072	0.246
	Sig. (2-tailed)	0.001		0.129	0	0.182	0.617	0.085
R3	Cor. Coef.	-0.035	-0.218	1	-0.206	0.323*	0.380**	0.211
	Sig. (2-tailed)	0.809	0.129		0.152	0.022	0.006	0.141
R4	Cor. Coef.	0.298*	0.550**	-0.206	1	-0.352*	-0.167	0.104
	Sig. (2-tailed)	0.035	0	0.152		0.012	0.248	0.471
R5	Cor. Coef.	0.168	-0.192	0.323*	-0.352*	1	0.523**	0.262
	Sig. (2-tailed)	0.243	0.182	0.022	0.012		0	0.066
R6	Cor. Coef.	0.229	0.072	0.380**	-0.167	0.523**	1	0.267
	Sig. (2-tailed)	0.11	0.617	0.006	0.248	0		0.061
R7	Cor. Coef.	0.346*	0.246	0.211	0.104	0.262	0.267	1
	Sig. (2-tailed)	0.014	0.085	0.141	0.471	0.066	0.061	
R8	Cor. Coef.	-0.016	-0.183	0.534**	-0.177	0.428**	0.487**	-0.045
	Sig. (2-tailed)	0.911	0.204	0	0.22	0.002	0	0.754
R9A	Cor. Coef.	0.084	-0.015	0.316*	0.099	0.25	0.097	-0.045
	Sig. (2-tailed)	0.562	0.916	0.025	0.496	0.08	0.503	0.758
R9B	Cor. Coef.	-0.193	-0.501**	0.444**	-0.760**	0.481**	0.355*	-0.105
	Sig. (2-tailed)	0.179	0	0.001	0	0	0.011	0.468
R10A	Cor. Coef.	-0.15	-0.187	0.193	-0.048	0.304*	-0.058	-0.011
	Sig. (2-tailed)	0.297	0.195	0.179	0.738	0.032	0.687	0.938
R10B	Cor. Coef.	-0.131	-0.282*	0.187	-0.206	0.357*	-0.164	-0.098
	Sig. (2-tailed)	0.366	0.047	0.193	0.15	0.011	0.255	0.498
R10C	Cor. Coef.	-0.125	-0.221	0.146	-0.369**	0.248	0.05	0.037
	Sig. (2-tailed)	0.387	0.122	0.312	0.008	0.082	0.728	0.801
R10D	Cor. Coef.	0.238	0.223	-0.243	0.345*	-0.292*	-0.248	0.144
	Sig. (2-tailed)	0.097	0.119	0.089	0.014	0.039	0.082	0.318
R10E	Cor. Coef.	0.218	0.167	0.046	0.27	0.026	-0.041	-0.088
	Sig. (2-tailed)	0.128	0.245	0.753	0.058	0.855	0.777	0.545
R10F	Cor. Coef.	0.038	-0.285*	0.101	-0.182	0.422**	0.085	-0.146
	Sig. (2-tailed)	0.794	0.045	0.485	0.206	0.002	0.558	0.311
R10G	Cor. Coef.	0.012	-0.244	0.258	-0.223	0.364**	0.071	-0.024
	Sig. (2-tailed)	0.931	0.088	0.071	0.119	0.009	0.623	0.87
R10H	Cor. Coef.	0.439**	0.198	0.018	0.157	0.291*	-0.016	0.354*
	Sig. (2-tailed)	0.001	0.169	0.901	0.276	0.04	0.914	0.012

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 19 continues

Table 19 continued.

		R1	R2	R3	R4	R5	R6	R7
R10I	Cor. Coef.	0.069	-0.13	0.334*	-0.088	0.523**	0.147	0.232
	Sig. (2-tailed)	0.636	0.368	0.018	0.545	0	0.307	0.104
R10J	Cor. Coef.	0.401**	0.279*	-0.012	0.256	-0.008	0.166	0.189
	Sig. (2-tailed)	0.004	0.049	0.932	0.073	0.955	0.249	0.189
R11A	Cor. Coef.	0.438**	0.218	-0.318*	0.319*	-0.092	-0.06	0.044
	Sig. (2-tailed)	0.001	0.129	0.025	0.024	0.526	0.68	0.761
R11B	Cor. Coef.	0.483**	0.365**	-0.23	0.486**	-0.103	-0.045	0.111
	Sig. (2-tailed)	0	0.009	0.108	0	0.476	0.759	0.442
R11C	Cor. Coef.	0.348*	0.298*	-0.372**	0.366**	-0.262	-0.149	0.053
	Sig. (2-tailed)	0.013	0.036	0.008	0.009	0.066	0.301	0.715
R11D	Cor. Coef.	0.271	0.355*	-0.375**	0.271	-0.242	-0.127	-0.048
	Sig. (2-tailed)	0.056	0.011	0.007	0.057	0.091	0.378	0.74
R12A	Cor. Coef.	-0.153	-0.205	0.105	-0.057	0.083	-0.033	-0.098
	Sig. (2-tailed)	0.289	0.153	0.467	0.694	0.567	0.82	0.498
R12B	Cor. Coef.	-0.166	-0.294*	0.111	-0.089	0.005	-0.158	-0.121
	Sig. (2-tailed)	0.248	0.038	0.444	0.537	0.975	0.274	0.403
R12C	Cor. Coef.	-0.035	-0.228	0.221	0.028	-0.088	-0.093	-0.024
	Sig. (2-tailed)	0.811	0.111	0.124	0.848	0.544	0.519	0.868
R12D	Cor. Coef.	-0.068	-0.274	0.049	-0.044	0.049	-0.074	-0.14
	Sig. (2-tailed)	0.638	0.054	0.735	0.76	0.735	0.609	0.332
R13A	Cor. Coef.	0.309*	-0.257	0.229	-0.114	0.336*	0.384**	0.188
	Sig. (2-tailed)	0.029	0.072	0.109	0.432	0.017	0.006	0.191
R13B	Cor. Coef.	0.182	-0.013	0.341*	-0.138	0.287*	0.125	0.154
	Sig. (2-tailed)	0.206	0.928	0.015	0.338	0.043	0.388	0.287
R13C	Cor. Coef.	0.422**	0.24	-0.179	0.104	0.290*	0.285*	0.174
	Sig. (2-tailed)	0.002	0.093	0.213	0.472	0.041	0.045	0.227
R13D	Cor. Coef.	0.328*	0.008	0.186	-0.16	0.474**	0.361*	0.176
	Sig. (2-tailed)	0.02	0.959	0.195	0.267	0.001	0.01	0.22
R14A	Cor. Coef.	-0.073	-0.299*	0.012	-0.242	0.018	-0.013	-0.015
	Sig. (2-tailed)	0.614	0.035	0.937	0.091	0.899	0.928	0.919
R14B	Cor. Coef.	0.181	-0.119	0.128	-0.212	0.354*	0.283*	0.101
	Sig. (2-tailed)	0.209	0.412	0.376	0.14	0.012	0.047	0.484
R14C	Cor. Coef.	0.03	-0.206	0.132	-0.179	0.439**	0.236	0.066
	Sig. (2-tailed)	0.834	0.152	0.362	0.213	0.001	0.099	0.647
R14D	Cor. Coef.	-0.047	-0.297*	0.241	-0.380**	0.531**	0.299*	0.102
	Sig. (2-tailed)	0.748	0.036	0.091	0.006	0	0.035	0.481

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 19 continues

Table 19 continued.

		R8	R9A	R9B	R10A	R10B	R10C	R10D
R1	Cor. Coef.	-0.016	0.084	-0.193	-0.15	-0.131	-0.125	0.238
	Sig. (2-tailed)	0.911	0.562	0.179	0.297	0.366	0.387	0.097
R2	Cor. Coef.	-0.183	-0.015	-0.501**	-0.187	-0.282*	-0.221	0.223
	Sig. (2-tailed)	0.204	0.916	0	0.195	0.047	0.122	0.119
R3	Cor. Coef.	0.534**	0.316*	0.444**	0.193	0.187	0.146	-0.243
	Sig. (2-tailed)	0	0.025	0.001	0.179	0.193	0.312	0.089
R4	Cor. Coef.	-0.177	0.099	-0.760**	-0.048	-0.206	-0.369**	0.345*
	Sig. (2-tailed)	0.22	0.496	0	0.738	0.15	0.008	0.014
R5	Cor. Coef.	0.428**	0.25	0.481**	0.304*	0.357*	0.248	-0.292*
	Sig. (2-tailed)	0.002	0.08	0	0.032	0.011	0.082	0.039
R6	Cor. Coef.	0.487**	0.097	0.355*	-0.058	-0.164	0.05	-0.248
	Sig. (2-tailed)	0	0.503	0.011	0.687	0.255	0.728	0.082
R7	Cor. Coef.	-0.045	-0.045	-0.105	-0.011	-0.098	0.037	0.144
	Sig. (2-tailed)	0.754	0.758	0.468	0.938	0.498	0.801	0.318
R8	Cor. Coef.	1	0.186	0.421**	0.042	0.178	0.071	-0.400**
	Sig. (2-tailed)		0.195	0.002	0.773	0.216	0.624	0.004
R9A	Cor. Coef.	0.186	1	0.213	0.189	0.451**	0.202	-0.135
	Sig. (2-tailed)	0.195		0.138	0.188	0.001	0.159	0.351
R9B	Cor. Coef.	0.421**	0.213	1	0.201	0.358*	0.510**	-0.522**
	Sig. (2-tailed)	0.002	0.138		0.161	0.011	0	0
R10A	Cor. Coef.	0.042	0.189	0.201	1	0.515**	0.353*	-0.129
	Sig. (2-tailed)	0.773	0.188	0.161		0	0.012	0.372
R10B	Cor. Coef.	0.178	0.451**	0.358*	0.515**	1	0.402**	-0.161
	Sig. (2-tailed)	0.216	0.001	0.011	0		0.004	0.265
R10C	Cor. Coef.	0.071	0.202	0.510**	0.353*	0.402**	1	-0.117
	Sig. (2-tailed)	0.624	0.159	0	0.012	0.004		0.419
R10D	Cor. Coef.	-0.400**	-0.135	-0.522**	-0.129	-0.161	-0.117	1
	Sig. (2-tailed)	0.004	0.351	0	0.372	0.265	0.419	
R10E	Cor. Coef.	-0.012	0.378**	-0.063	0.111	0.099	0.033	0.327*
	Sig. (2-tailed)	0.935	0.007	0.664	0.444	0.496	0.819	0.02
R10F	Cor. Coef.	0.261	0.221	0.338*	0.524**	0.401**	0.348*	-0.11
	Sig. (2-tailed)	0.067	0.124	0.016	0	0.004	0.013	0.446
R10G	Cor. Coef.	0.099	0.334*	0.392**	0.457**	0.529**	0.601**	0.093
	Sig. (2-tailed)	0.496	0.018	0.005	0.001	0	0	0.523
R10H	Cor. Coef.	-0.053	0.281*	-0.052	0.231	0.175	0.251	0.115
	Sig. (2-tailed)	0.715	0.048	0.721	0.106	0.223	0.079	0.428

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 19 continues

Table 19 continued.

		R8	R9A	R9B	R10A	R10B	R10C	R10D
R10I	Cor. Coef.	0.197	0.352*	0.266	0.519**	0.392**	0.361**	-0.037
	Sig. (2-tailed)	0.17	0.012	0.062	0	0.005	0.01	0.799
R10J	Cor. Coef.	-0.108	-0.065	-0.15	-0.05	-0.032	-0.059	0.216
	Sig. (2-tailed)	0.457	0.653	0.297	0.732	0.825	0.683	0.133
R11A	Cor. Coef.	-0.173	0.324*	-0.242	-0.078	0.043	0.072	0.468**
	Sig. (2-tailed)	0.23	0.022	0.09	0.589	0.768	0.621	0.001
R11B	Cor. Coef.	-0.172	0.208	-0.372**	0.026	-0.035	-0.084	0.536**
	Sig. (2-tailed)	0.233	0.147	0.008	0.859	0.812	0.561	0
R11C	Cor. Coef.	-0.322*	0.009	-0.356*	-0.055	-0.06	-0.024	0.600**
	Sig. (2-tailed)	0.023	0.951	0.011	0.706	0.678	0.867	0
R11D	Cor. Coef.	-0.305*	-0.114	-0.348*	-0.001	-0.133	0.02	0.567**
	Sig. (2-tailed)	0.031	0.431	0.013	0.996	0.358	0.888	0
R12A	Cor. Coef.	0.042	0.073	0.377**	0.282*	0.266	0.403**	-0.217
	Sig. (2-tailed)	0.774	0.615	0.007	0.047	0.062	0.004	0.131
R12B	Cor. Coef.	0.137	0.073	0.344*	0.353*	0.409**	0.355*	-0.168
	Sig. (2-tailed)	0.344	0.614	0.014	0.012	0.003	0.011	0.243
R12C	Cor. Coef.	-0.084	0.092	0.109	0.315*	0.235	0.219	0.037
	Sig. (2-tailed)	0.564	0.525	0.451	0.026	0.101	0.126	0.796
R12D	Cor. Coef.	0.017	0.214	0.337*	0.277	0.305*	0.293*	-0.22
	Sig. (2-tailed)	0.909	0.135	0.017	0.052	0.031	0.039	0.125
R13A	Cor. Coef.	0.325*	-0.056	0.159	0.209	-0.043	0.261	0.139
	Sig. (2-tailed)	0.021	0.702	0.27	0.145	0.766	0.067	0.335
R13B	Cor. Coef.	0.255	0.141	0.242	0.113	0.222	0.12	0.026
	Sig. (2-tailed)	0.074	0.328	0.091	0.436	0.121	0.407	0.858
R13C	Cor. Coef.	-0.027	0.142	-0.112	0.079	-0.019	-0.014	0.231
	Sig. (2-tailed)	0.851	0.326	0.438	0.585	0.896	0.923	0.106
R13D	Cor. Coef.	0.351*	0.252	0.408**	-0.127	0.15	0.238	-0.213
	Sig. (2-tailed)	0.013	0.077	0.003	0.379	0.299	0.096	0.137
R14A	Cor. Coef.	-0.124	0.05	0.330*	0.163	0.124	0.463**	-0.007
	Sig. (2-tailed)	0.391	0.731	0.019	0.257	0.39	0.001	0.964
R14B	Cor. Coef.	0.051	0.164	0.305*	0.26	0.072	0.357*	-0.023
	Sig. (2-tailed)	0.726	0.254	0.031	0.068	0.619	0.011	0.875
R14C	Cor. Coef.	0.156	0.235	0.333*	0.290*	0.25	0.223	-0.072
	Sig. (2-tailed)	0.28	0.101	0.018	0.041	0.08	0.12	0.622
R14D	Cor. Coef.	0.221	0.26	0.490**	0.311*	0.256	0.285*	-0.395**
	Sig. (2-tailed)	0.122	0.069	0	0.028	0.072	0.045	0.005

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 19 continues

Table 19 continued.

		R10E	R10F	R10G	R10H	R10I	R10J	R11A
R1	Cor. Coef.	0.218	0.038	0.012	0.439**	0.069	0.401**	0.438**
	Sig. (2-tailed)	0.128	0.794	0.931	0.001	0.636	0.004	0.001
R2	Cor. Coef.	0.167	-0.285*	-0.244	0.198	-0.13	0.279*	0.218
	Sig. (2-tailed)	0.245	0.045	0.088	0.169	0.368	0.049	0.129
R3	Cor. Coef.	0.046	0.101	0.258	0.018	0.334*	-0.012	-0.318*
	Sig. (2-tailed)	0.753	0.485	0.071	0.901	0.018	0.932	0.025
R4	Cor. Coef.	0.27	-0.182	-0.223	0.157	-0.088	0.256	0.319*
	Sig. (2-tailed)	0.058	0.206	0.119	0.276	0.545	0.073	0.024
R5	Cor. Coef.	0.026	0.422**	0.364**	0.291*	0.523**	-0.008	-0.092
	Sig. (2-tailed)	0.855	0.002	0.009	0.04	0	0.955	0.526
R6	Cor. Coef.	-0.041	0.085	0.071	-0.016	0.147	0.166	-0.06
	Sig. (2-tailed)	0.777	0.558	0.623	0.914	0.307	0.249	0.68
R7	Cor. Coef.	-0.088	-0.146	-0.024	0.354*	0.232	0.189	0.044
	Sig. (2-tailed)	0.545	0.311	0.87	0.012	0.104	0.189	0.761
R8	Cor. Coef.	-0.012	0.261	0.099	-0.053	0.197	-0.108	-0.173
	Sig. (2-tailed)	0.935	0.067	0.496	0.715	0.17	0.457	0.23
R9A	Cor. Coef.	0.378**	0.221	0.334*	0.281*	0.352*	-0.065	0.324*
	Sig. (2-tailed)	0.007	0.124	0.018	0.048	0.012	0.653	0.022
R9B	Cor. Coef.	-0.063	0.338*	0.392**	-0.052	0.266	-0.15	-0.242
	Sig. (2-tailed)	0.664	0.016	0.005	0.721	0.062	0.297	0.09
R10A	Cor. Coef.	0.111	0.524**	0.457**	0.231	0.519**	-0.05	-0.078
	Sig. (2-tailed)	0.444	0	0.001	0.106	0	0.732	0.589
R10B	Cor. Coef.	0.099	0.401**	0.529**	0.175	0.392**	-0.032	0.043
	Sig. (2-tailed)	0.496	0.004	0	0.223	0.005	0.825	0.768
R10C	Cor. Coef.	0.033	0.348*	0.601**	0.251	0.361**	-0.059	0.072
	Sig. (2-tailed)	0.819	0.013	0	0.079	0.01	0.683	0.621
R10D	Cor. Coef.	0.327*	-0.11	0.093	0.115	-0.037	0.216	0.468**
	Sig. (2-tailed)	0.02	0.446	0.523	0.428	0.799	0.133	0.001
R10E	Cor. Coef.	1	0.158	0.294*	0.305*	0.203	0.322*	0.268
	Sig. (2-tailed)		0.272	0.038	0.031	0.156	0.023	0.06
R10F	Cor. Coef.	0.158	1	0.586**	0.246	0.436**	0.048	0.058
	Sig. (2-tailed)	0.272	.	0	0.086	0.002	0.74	0.691
R10G	Cor. Coef.	0.294*	0.586**	1	0.330*	0.468**	0.103	0.087
	Sig. (2-tailed)	0.038	0	.	0.019	0.001	0.478	0.55
R10H	Cor. Coef.	0.305*	0.246	0.330*	1	0.489**	0.289*	0.403**
	Sig. (2-tailed)	0.031	0.086	0.019	.	0	0.042	0.004

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 19 continues

Table 19 continued.

		R10E	R10F	R10G	R10H	R10I	R10J	R11A
R10I	Cor. Coef.	0.203	0.436**	0.468**	0.489**	1	0.149	0.085
	Sig. (2-tailed)	0.156	0.002	0.001	0		0.302	0.559
R10J	Cor. Coef.	0.322*	0.048	0.103	0.289*	0.149	1	0.298*
	Sig. (2-tailed)	0.023	0.74	0.478	0.042	0.302		0.036
R11A	Cor. Coef.	0.268	0.058	0.087	0.403**	0.085	0.298*	1
	Sig. (2-tailed)	0.06	0.691	0.55	0.004	0.559	0.036	
R11B	Cor. Coef.	0.264	0.012	0.023	0.277	0.061	0.325*	0.807**
	Sig. (2-tailed)	0.064	0.936	0.875	0.051	0.673	0.021	0
R11C	Cor. Coef.	0.092	0.061	0.096	0.164	-0.122	0.226	0.728**
	Sig. (2-tailed)	0.524	0.674	0.509	0.255	0.4	0.114	0
R11D	Cor. Coef.	0.145	0.004	0.058	0.165	-0.152	0.213	0.677**
	Sig. (2-tailed)	0.314	0.979	0.688	0.252	0.293	0.138	0
R12A	Cor. Coef.	0.051	0.273	0.322*	-0.031	0.297*	0.019	-0.057
	Sig. (2-tailed)	0.725	0.056	0.023	0.832	0.036	0.895	0.695
R12B	Cor. Coef.	-0.053	0.399**	0.281*	-0.038	0.224	-0.062	-0.066
	Sig. (2-tailed)	0.717	0.004	0.048	0.795	0.118	0.667	0.647
R12C	Cor. Coef.	0.225	0.133	0.23	0.063	0.198	0.068	-0.058
	Sig. (2-tailed)	0.117	0.357	0.109	0.665	0.168	0.639	0.688
R12D	Cor. Coef.	0.156	0.247	0.289*	0.046	0.264	-0.116	-0.005
	Sig. (2-tailed)	0.278	0.084	0.042	0.75	0.064	0.422	0.972
R13A	Cor. Coef.	0.125	0.337*	0.212	0.293*	0.23	0.106	0.195
	Sig. (2-tailed)	0.389	0.017	0.14	0.039	0.107	0.464	0.174
R13B	Cor. Coef.	0.242	0.233	0.263	0.263	0.259	0.18	0.008
	Sig. (2-tailed)	0.091	0.103	0.065	0.065	0.069	0.211	0.955
R13C	Cor. Coef.	0.295*	0.042	0.225	0.268	0.259	0.322*	0.303*
	Sig. (2-tailed)	0.038	0.771	0.116	0.06	0.069	0.022	0.032
R13D	Cor. Coef.	0.036	0.147	0.196	0.137	0.097	-0.064	0.012
	Sig. (2-tailed)	0.806	0.31	0.172	0.341	0.504	0.657	0.933
R14A	Cor. Coef.	-0.066	0.151	0.345*	0.027	0.097	-0.148	0.009
	Sig. (2-tailed)	0.649	0.294	0.014	0.855	0.504	0.304	0.948
R14B	Cor. Coef.	0.155	0.344*	0.224	0.08	0.290*	0.024	0.07
	Sig. (2-tailed)	0.283	0.014	0.119	0.583	0.041	0.868	0.63
R14C	Cor. Coef.	0.204	0.341*	0.268	-0.02	0.333*	-0.076	-0.02
	Sig. (2-tailed)	0.155	0.015	0.06	0.888	0.018	0.598	0.891
R14D	Cor. Coef.	-0.126	0.196	0.214	0.156	0.338*	-0.172	-0.096
	Sig. (2-tailed)	0.384	0.171	0.137	0.279	0.016	0.232	0.508

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 19 continues

Table 19 continued.

		R11B	R11C	R11D	R12A	R12B	R12C	R12D
R1	Cor. Coef.	0.483**	0.348*	0.271	-0.153	-0.166	-0.035	-0.068
	Sig. (2-tailed)	0	0.013	0.056	0.289	0.248	0.811	0.638
R2	Cor. Coef.	0.365**	.298*	0.355*	-0.205	-0.294*	-0.228	-0.274
	Sig. (2-tailed)	0.009	0.036	0.011	0.153	0.038	0.111	0.054
R3	Cor. Coef.	-0.23	-0.372**	-0.375**	0.105	0.111	0.221	0.049
	Sig. (2-tailed)	0.108	0.008	0.007	0.467	0.444	0.124	0.735
R4	Cor. Coef.	0.486**	0.366**	0.271	-0.057	-0.089	0.028	-0.044
	Sig. (2-tailed)	0	0.009	0.057	0.694	0.537	0.848	0.76
R5	Cor. Coef.	-0.103	-0.262	-0.242	0.083	0.005	-0.088	0.049
	Sig. (2-tailed)	0.476	0.066	0.091	0.567	0.975	0.544	0.735
R6	Cor. Coef.	-0.045	-0.149	-0.127	-0.033	-0.158	-0.093	-0.074
	Sig. (2-tailed)	0.759	0.301	0.378	0.82	0.274	0.519	0.609
R7	Cor. Coef.	0.111	0.053	-0.048	-0.098	-0.121	-0.024	-0.14
	Sig. (2-tailed)	0.442	0.715	0.74	0.498	0.403	0.868	0.332
R8	Cor. Coef.	-0.172	-0.322*	-0.305*	0.042	0.137	-0.084	0.017
	Sig. (2-tailed)	0.233	0.023	0.031	0.774	0.344	0.564	0.909
R9A	Cor. Coef.	0.208	0.009	-0.114	0.073	0.073	0.092	0.214
	Sig. (2-tailed)	0.147	0.951	0.431	0.615	0.614	0.525	0.135
R9B	Cor. Coef.	-0.372**	-0.356*	-0.348*	0.377**	0.344*	0.109	0.337*
	Sig. (2-tailed)	0.008	0.011	0.013	0.007	0.014	0.451	0.017
R10A	Cor. Coef.	0.026	-0.055	-0.001	0.282*	0.353*	0.315*	0.277
	Sig. (2-tailed)	0.859	0.706	0.996	0.047	0.012	0.026	0.052
R10B	Cor. Coef.	-0.035	-0.06	-0.133	0.266	0.409**	0.235	0.305*
	Sig. (2-tailed)	0.812	0.678	0.358	0.062	0.003	0.101	0.031
R10C	Cor. Coef.	-0.084	-0.024	0.02	0.403**	0.355*	0.219	0.293*
	Sig. (2-tailed)	0.561	0.867	0.888	0.004	0.011	0.126	0.039
R10D	Cor. Coef.	0.536**	0.600**	0.567**	-0.217	-0.168	0.037	-0.22
	Sig. (2-tailed)	0	0	0	0.131	0.243	0.796	0.125
R10E	Cor. Coef.	0.264	0.092	0.145	0.051	-0.053	0.225	0.156
	Sig. (2-tailed)	0.064	0.524	0.314	0.725	0.717	0.117	0.278
R10F	Cor. Coef.	0.012	0.061	0.004	0.273	0.399**	0.133	0.247
	Sig. (2-tailed)	0.936	0.674	0.979	0.056	0.004	0.357	0.084
R10G	Cor. Coef.	0.023	0.096	0.058	0.322*	0.281*	0.23	0.289*
	Sig. (2-tailed)	0.875	0.509	0.688	0.023	0.048	0.109	0.042
R10H	Cor. Coef.	0.277	0.164	0.165	-0.031	-0.038	0.063	0.046
	Sig. (2-tailed)	0.051	0.255	0.252	0.832	0.795	0.665	0.75

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 19 continues

Table 19 continued.

		R11B	R11C	R11D	R12A	R12B	R12C	R12D
R10I	Cor. Coef.	0.061	-0.122	-0.152	0.297*	0.224	0.198	0.264
	Sig. (2-tailed)	0.673	0.4	0.293	0.036	0.118	0.168	0.064
R10J	Cor. Coef.	0.325*	0.226	0.213	0.019	-0.062	0.068	-0.116
	Sig. (2-tailed)	0.021	0.114	0.138	0.895	0.667	0.639	0.422
R11A	Cor. Coef.	0.807**	0.728**	0.677**	-0.057	-0.066	-0.058	-0.005
	Sig. (2-tailed)	0	0	0	0.695	0.647	0.688	0.972
R11B	Cor. Coef.	1	0.763**	0.733**	-0.142	-0.081	0.002	-0.155
	Sig. (2-tailed)		0	0	0.325	0.578	0.992	0.283
R11C	Cor. Coef.	0.763**	1	0.860**	-0.13	-0.048	0.04	-0.147
	Sig. (2-tailed)	0		0	0.368	0.742	0.784	0.308
R11D	Cor. Coef.	0.733**	0.860**	1	-0.125	-0.072	0.033	-0.165
	Sig. (2-tailed)	0	0		0.387	0.619	0.823	0.252
R12A	Cor. Coef.	-0.142	-0.13	-0.125	1	0.838**	0.442**	0.668**
	Sig. (2-tailed)	0.325	0.368	0.387		0	0.001	0
R12B	Cor. Coef.	-0.081	-0.048	-0.072	0.838**	1	0.558**	0.645**
	Sig. (2-tailed)	0.578	0.742	0.619	0		0	0
R12C	Cor. Coef.	0.002	0.04	0.033	0.442**	0.558**	1	0.635**
	Sig. (2-tailed)	0.992	0.784	0.823	0.001	0		0
R12D	Cor. Coef.	-0.155	-0.147	-0.165	0.668**	0.645**	0.635**	1
	Sig. (2-tailed)	0.283	0.308	0.252	0	0	0	
R13A	Cor. Coef.	0.149	0.146	0.197	0.046	0.048	0.046	-0.066
	Sig. (2-tailed)	0.303	0.311	0.17	0.751	0.743	0.749	0.649
R13B	Cor. Coef.	0.135	-0.088	-0.079	-0.145	-0.194	-0.136	-0.22
	Sig. (2-tailed)	0.349	0.544	0.588	0.315	0.178	0.346	0.125
R13C	Cor. Coef.	0.269	0.182	0.21	0.039	-0.068	0.039	0.084
	Sig. (2-tailed)	0.059	0.206	0.144	0.788	0.64	0.788	0.563
R13D	Cor. Coef.	0.088	-0.03	-0.121	-0.019	0.008	-0.078	0.069
	Sig. (2-tailed)	0.545	0.836	0.402	0.895	0.955	0.59	0.633
R14A	Cor. Coef.	-0.13	-0.116	-0.072	0.443**	0.328*	0.016	0.189
	Sig. (2-tailed)	0.368	0.424	0.619	0.001	0.02	0.911	0.189
R14B	Cor. Coef.	0.129	-0.053	-0.019	0.288*	0.253	0.197	0.132
	Sig. (2-tailed)	0.373	0.713	0.896	0.043	0.077	0.17	0.36
R14C	Cor. Coef.	0.01	-0.147	-0.158	0.367**	0.353*	0.194	0.221
	Sig. (2-tailed)	0.945	0.31	0.272	0.009	0.012	0.176	0.123
R14D	Cor. Coef.	-0.186	-0.359*	-0.273	0.212	0.155	0.078	0.225
	Sig. (2-tailed)	0.196	0.01	0.055	0.139	0.282	0.591	0.116

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 19 continues

Table 19 continued.

		R13A	R13B	R13C	R13D	R14A	R14B	R14C
R1	Cor. Coef.	0.309*	0.182	0.422**	0.328*	-0.073	0.181	0.03
	Sig. (2-tailed)	0.029	0.206	0.002	0.02	0.614	0.209	0.834
R2	Cor. Coef.	-0.257	-0.013	0.24	0.008	-0.299*	-0.119	-0.206
	Sig. (2-tailed)	0.072	0.928	0.093	0.959	0.035	0.412	0.152
R3	Cor. Coef.	0.229	0.341*	-0.179	0.186	0.012	0.128	0.132
	Sig. (2-tailed)	0.109	0.015	0.213	0.195	0.937	0.376	0.362
R4	Cor. Coef.	-0.114	-0.138	0.104	-0.16	-0.242	-0.212	-0.179
	Sig. (2-tailed)	0.432	0.338	0.472	0.267	0.091	0.14	0.213
R5	Cor. Coef.	0.336*	0.287*	0.290*	0.474**	0.018	0.354*	0.439**
	Sig. (2-tailed)	0.017	0.043	0.041	0.001	0.899	0.012	0.001
R6	Cor. Coef.	0.384**	0.125	0.285*	0.361*	-0.013	0.283*	0.236
	Sig. (2-tailed)	0.006	0.388	0.045	0.01	0.928	0.047	0.099
R7	Cor. Coef.	0.188	0.154	0.174	0.176	-0.015	0.101	0.066
	Sig. (2-tailed)	0.191	0.287	0.227	0.22	0.919	0.484	0.647
R8	Cor. Coef.	0.325*	0.255	-0.027	0.351*	-0.124	0.051	0.156
	Sig. (2-tailed)	0.021	0.074	0.851	0.013	0.391	0.726	0.28
R9A	Cor. Coef.	-0.056	0.141	0.142	0.252	0.05	0.164	0.235
	Sig. (2-tailed)	0.702	0.328	0.326	0.077	0.731	0.254	0.101
R9B	Cor. Coef.	0.159	0.242	-0.112	0.408**	0.330*	0.305*	0.333*
	Sig. (2-tailed)	0.27	0.091	0.438	0.003	0.019	0.031	0.018
R10A	Cor. Coef.	0.209	0.113	0.079	-0.127	0.163	0.26	0.290*
	Sig. (2-tailed)	0.145	0.436	0.585	0.379	0.257	0.068	0.041
R10B	Cor. Coef.	-0.043	0.222	-0.019	0.15	0.124	0.072	0.25
	Sig. (2-tailed)	0.766	0.121	0.896	0.299	0.39	0.619	0.08
R10C	Cor. Coef.	0.261	0.12	-0.014	0.238	0.463**	0.357*	0.223
	Sig. (2-tailed)	0.067	0.407	0.923	0.096	0.001	0.011	0.12
R10D	Cor. Coef.	0.139	0.026	0.231	-0.213	-0.007	-0.023	-0.072
	Sig. (2-tailed)	0.335	0.858	0.106	0.137	0.964	0.875	0.622
R10E	Cor. Coef.	0.125	0.242	0.295*	0.036	-0.066	0.155	0.204
	Sig. (2-tailed)	0.389	0.091	0.038	0.806	0.649	0.283	0.155
R10F	Cor. Coef.	0.337*	0.233	0.042	0.147	0.151	0.344*	0.341*
	Sig. (2-tailed)	0.017	0.103	0.771	0.31	0.294	0.014	0.015
R10G	Cor. Coef.	0.212	0.263	0.225	0.196	0.345*	0.224	0.268
	Sig. (2-tailed)	0.14	0.065	0.116	0.172	0.014	0.119	0.06
R10H	Cor. Coef.	0.293*	0.263	0.268	0.137	0.027	0.08	-0.02
	Sig. (2-tailed)	0.039	0.065	0.06	0.341	0.855	0.583	0.888

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 19 continues

Table 19 continued.

		R13A	R13B	R13C	R13D	R14A	R14B	R14C
R10I	Cor. Coef.	0.23	0.259	0.259	0.097	0.097	0.290*	0.333*
	Sig. (2-tailed)	0.107	0.069	0.069	0.504	0.504	0.041	0.018
R10J	Cor. Coef.	0.106	0.18	0.322*	-0.064	-0.148	0.024	-0.076
	Sig. (2-tailed)	0.464	0.211	0.022	0.657	0.304	0.868	0.598
R11A	Cor. Coef.	0.195	0.008	0.303*	0.012	0.009	0.07	-0.02
	Sig. (2-tailed)	0.174	0.955	0.032	0.933	0.948	0.63	0.891
R11B	Cor. Coef.	0.149	0.135	0.269	0.088	-0.13	0.129	0.01
	Sig. (2-tailed)	0.303	0.349	0.059	0.545	0.368	0.373	0.945
R11C	Cor. Coef.	0.146	-0.088	0.182	-0.03	-0.116	-0.053	-0.147
	Sig. (2-tailed)	0.311	0.544	0.206	0.836	0.424	0.713	0.31
R11D	Cor. Coef.	0.197	-0.079	0.21	-0.121	-0.072	-0.019	-0.158
	Sig. (2-tailed)	0.17	0.588	0.144	0.402	0.619	0.896	0.272
R12A	Cor. Coef.	0.046	-0.145	0.039	-0.019	0.443**	0.288*	0.367**
	Sig. (2-tailed)	0.751	0.315	0.788	0.895	0.001	0.043	0.009
R12B	Cor. Coef.	0.048	-0.194	-0.068	0.008	0.328*	0.253	0.353*
	Sig. (2-tailed)	0.743	0.178	0.64	0.955	0.02	0.077	0.012
R12C	Cor. Coef.	0.046	-0.136	0.039	-0.078	0.016	0.197	0.194
	Sig. (2-tailed)	0.749	0.346	0.788	0.59	0.911	0.17	0.176
R12D	Cor. Coef.	-0.066	-0.22	0.084	0.069	0.189	0.132	0.221
	Sig. (2-tailed)	0.649	0.125	0.563	0.633	0.189	0.36	0.123
R13A	Cor. Coef.	1	0.267	0.191	0.128	0.135	0.285*	0.116
	Sig. (2-tailed)		0.061	0.184	0.375	0.351	0.045	0.423
R13B	Cor. Coef.	0.267	1	0.047	.304*	0.009	0.104	0.077
	Sig. (2-tailed)	0.061		0.744	0.032	0.951	0.472	0.595
R13C	Cor. Coef.	0.191	0.047	1	0.141	0.053	0.308*	0.329*
	Sig. (2-tailed)	0.184	0.744		0.328	0.713	0.029	0.02
R13D	Cor. Coef.	0.128	0.304*	0.141	1	0.115	0.241	0.306*
	Sig. (2-tailed)	0.375	0.032	0.328		0.425	0.092	0.03
R14A	Cor. Coef.	0.135	0.009	0.053	0.115	1	0.504**	0.494**
	Sig. (2-tailed)	0.351	0.951	0.713	0.425		0	0
R14B	Cor. Coef.	0.285*	0.104	0.308*	0.241	0.504**	1	0.840**
	Sig. (2-tailed)	0.045	0.472	0.029	0.092	0		0
R14C	Cor. Coef.	0.116	0.077	0.329*	0.306*	0.494**	0.840**	1
	Sig. (2-tailed)	0.423	0.595	0.02	0.03	0	0	
R14D	Cor. Coef.	0.034	0.104	0.093	0.167	0.392**	0.539**	0.569**
	Sig. (2-tailed)	0.816	0.471	0.52	0.248	0.005	0	0

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 19 continues

Table 19 continued.

		R14D	R14E	R14F	R14G
R1	Cor. Coef.	-0.047	-0.033	-0.016	-0.154
	Sig. (2-tailed)	0.748	0.821	0.914	0.285
R2	Cor. Coef.	-0.297*	-0.271	-0.375**	-0.506**
	Sig. (2-tailed)	0.036	0.057	0.007	0
R3	Cor. Coef.	0.241	0.252	0.223	0.183
	Sig. (2-tailed)	0.091	0.077	0.119	0.204
R4	Cor. Coef.	-0.380**	-0.389**	-0.467**	-0.526**
	Sig. (2-tailed)	0.006	0.005	0.001	0
R5	Cor. Coef.	0.531**	0.499**	0.479**	0.423**
	Sig. (2-tailed)	0	0	0	0.002
R6	Cor. Coef.	0.299*	0.401**	0.229	0.186
	Sig. (2-tailed)	0.035	0.004	0.11	0.197
R7	Cor. Coef.	0.102	0.037	0.089	0.016
	Sig. (2-tailed)	0.481	0.797	0.537	0.915
R8	Cor. Coef.	0.221	0.221	0.137	0.068
	Sig. (2-tailed)	0.122	0.123	0.342	0.638
R9A	Cor. Coef.	0.26	0.2	0.188	0.163
	Sig. (2-tailed)	0.069	0.163	0.19	0.258
R9B	Cor. Coef.	0.490**	0.526**	0.579**	0.563**
	Sig. (2-tailed)	0	0	0	0
R10A	Cor. Coef.	0.311*	0.328*	0.363**	0.381**
	Sig. (2-tailed)	0.028	0.02	0.01	0.006
R10B	Cor. Coef.	0.256	0.354*	0.306*	0.314*
	Sig. (2-tailed)	0.072	0.012	0.031	0.027
R10C	Cor. Coef.	0.285*	0.458**	0.506**	0.493**
	Sig. (2-tailed)	0.045	0.001	0	0
R10D	Cor. Coef.	-0.395**	-0.264	-0.321*	-0.350*
	Sig. (2-tailed)	0.005	0.064	0.023	0.013
R10E	Cor. Coef.	-0.126	-0.147	-0.101	-0.171
	Sig. (2-tailed)	0.384	0.309	0.484	0.234
R10F	Cor. Coef.	0.196	0.360*	0.378**	0.367**
	Sig. (2-tailed)	0.171	0.01	0.007	0.009
R10G	Cor. Coef.	0.214	0.495**	0.480**	0.317*
	Sig. (2-tailed)	0.137	0	0	0.025
R10H	Cor. Coef.	0.156	0.156	0.209	-0.071
	Sig. (2-tailed)	0.279	0.281	0.146	0.626

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 19 continues

Table 19 continued.

		R14D	R14E	R14F	R14G
R10I	Cor. Coef.	0.338*	0.390**	0.380**	0.331*
	Sig. (2-tailed)	0.016	0.005	0.006	0.019
R10J	Cor. Coef.	-0.172	-0.034	-0.232	-0.317*
	Sig. (2-tailed)	0.232	0.813	0.105	0.025
R11A	Cor. Coef.	-0.096	-0.084	-0.094	-0.164
	Sig. (2-tailed)	0.508	0.561	0.515	0.256
R11B	Cor. Coef.	-0.186	-0.196	-0.248	-0.237
	Sig. (2-tailed)	0.196	0.173	0.082	0.098
R11C	Cor. Coef.	-0.359*	-0.19	-0.199	-0.21
	Sig. (2-tailed)	0.01	0.187	0.165	0.144
R11D	Cor. Coef.	-0.273	-0.19	-0.264	-0.238
	Sig. (2-tailed)	0.055	0.187	0.064	0.096
R12A	Cor. Coef.	0.212	0.348*	0.339*	0.320*
	Sig. (2-tailed)	0.139	0.013	0.016	0.023
R12B	Cor. Coef.	0.155	0.318*	0.311*	0.327*
	Sig. (2-tailed)	0.282	0.024	0.028	0.02
R12C	Cor. Coef.	0.078	0.164	0.117	0.272
	Sig. (2-tailed)	0.591	0.255	0.419	0.056
R12D	Cor. Coef.	0.225	0.219	0.268	0.340*
	Sig. (2-tailed)	0.116	0.126	0.06	0.016
R13A	Cor. Coef.	0.034	0.091	0.169	0.061
	Sig. (2-tailed)	0.816	0.531	0.241	0.674
R13B	Cor. Coef.	0.104	-0.022	-0.047	-0.111
	Sig. (2-tailed)	0.471	0.879	0.748	0.441
R13C	Cor. Coef.	0.093	0.187	0.132	-0.066
	Sig. (2-tailed)	0.52	0.193	0.36	0.647
R13D	Cor. Coef.	0.167	0.235	0.300*	0.281*
	Sig. (2-tailed)	0.248	0.101	0.035	0.048
R14A	Cor. Coef.	0.392**	0.573**	0.572**	0.494**
	Sig. (2-tailed)	0.005	0	0	0
R14B	Cor. Coef.	0.539**	0.591**	0.600**	0.589**
	Sig. (2-tailed)	0	0	0	0
R14C	Cor. Coef.	0.569**	0.654**	0.625**	0.615**
	Sig. (2-tailed)	0	0	0	0
R14D	Cor. Coef.	1	0.758**	0.593**	0.640**
	Sig. (2-tailed)	.	0	0	0

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 19a

Nonparametric Correlations – Spearman's rho N=50 compiled

		R1	R2	R3	R4	R5	R6	R7
R14E	Cor. Coef.	-0.033	-0.271	0.252	-0.389**	0.499**	0.401**	0.037
	Sig. (2-tailed)	0.821	0.057	0.077	0.005	0	0.004	0.797
R14F	Cor. Coef.	-0.016	-0.375**	0.223	-0.467**	0.479**	0.229	0.089
	Sig. (2-tailed)	0.914	0.007	0.119	0.001	0	0.11	0.537
R14G	Cor. Coef.	-0.154	-0.506**	0.183	-0.526**	0.423**	0.186	0.016
	Sig. (2-tailed)	0.285	0	0.204	0	0.002	0.197	0.915

** Correlation is significant at the 0.01 level (2-tailed).

- Correlation is significant at the 0.05 level (2-tailed).

		R8	R9A	R9B	R10A	R10B	R10C	R10D
R14E	Cor. Coef.	0.221	0.2	0.526**	0.328*	0.354*	0.458**	-0.264
	Sig. (2-tailed)	0.123	0.163	0	0.02	0.012	0.001	0.064
R14F	Cor. Coef.	0.137	0.188	0.579**	0.363**	0.306*	0.506**	-0.321*
	Sig. (2-tailed)	0.342	0.19	0	0.01	0.031	0	0.023
R14G	Cor. Coef.	0.068	0.163	0.563**	0.381**	0.314*	0.493**	-0.350*
	Sig. (2-tailed)	0.638	0.258	0	0.006	0.027	0	0.013

** Correlation is significant at the 0.01 level (2-tailed).

- Correlation is significant at the 0.05 level (2-tailed).

		R10E	R10F	R10G	R10H	R10I	R10J	R11A
R14E	Cor. Coef.	-0.147	0.360*	0.495**	0.156	0.390**	-0.034	-0.084
	Sig. (2-tailed)	0.309	0.01	0	0.281	0.005	0.813	0.561
R14F	Cor. Coef.	-0.101	0.378**	0.480**	0.209	0.380**	-0.232	-0.094
	Sig. (2-tailed)	0.484	0.007	0	0.146	0.006	0.105	0.515
R14G	Cor. Coef.	-0.171	0.367**	0.317*	-0.071	0.331*	-0.317*	-0.164
	Sig. (2-tailed)	0.234	0.009	0.025	0.626	0.019	0.025	0.256

** Correlation is significant at the 0.01 level (2-tailed).

- Correlation is significant at the 0.05 level (2-tailed).

		R11B	R11C	R11D	R12A	R12B	R12C	R12D
R14E	Cor. Coef.	-0.196	-0.19	-0.19	0.348*	0.318*	0.164	0.219
	Sig. (2-tailed)	0.173	0.187	0.187	0.013	0.024	0.255	0.126
R14F	Cor. Coef.	-0.248	-0.199	-0.264	0.339*	0.311*	0.117	0.268
	Sig. (2-tailed)	0.082	0.165	0.064	0.016	0.028	0.419	0.06
R14G	Cor. Coef.	-0.237	-0.21	-0.238	0.320*	0.327*	0.272	0.340*
	Sig. (2-tailed)	0.098	0.144	0.096	0.023	0.02	0.056	0.016

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 19a continues

Table 19a continued.

		R13A	R13B	R13C	R13D	R14A	R14B	R14C
R14E	Cor. Coef.	0.091	-0.022	0.187	0.235	0.573**	0.591**	0.654**
	Sig. (2-tailed)	0.531	0.879	0.193	0.101	0	0	0
R14F	Cor. Coef.	0.169	-0.047	0.132	0.300*	0.572**	0.600**	0.625**
	Sig. (2-tailed)	0.241	0.748	0.36	0.035	0	0	0
R14G	Cor. Coef.	0.061	-0.111	-0.066	0.281*	0.494**	0.589**	0.615**
	Sig. (2-tailed)	0.674	0.441	0.647	0.048	0	0	0

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

		R14D	R14E	R14F	R14G
R14E	Cor. Coef.	0.758**	1	0.813**	0.683**
	Sig. (2-tailed)	0		0	0
R14F	Cor. Coef.	0.593**	0.813**	1	0.743**
	Sig. (2-tailed)	0	0		0
R14G	Cor. Coef.	0.640**	0.683**	0.743**	1
	Sig. (2-tailed)	0	0	0	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

APPENDIX H
INTERVIEW

- Thank you very much for participating in my research.
 - Please, if you have problems with my pronunciation, let me know.
 - My research is an exploratory study. Essentially, what I am looking for is to identify factors that may affect collaboration, and the possible stages in a collaborative project.
 - Can I record our conversation?
- 1.a Please, what were the main activities needed to achieve the objectives that you remember.
 - 1.b What resources were needed? In general terms.
 - 1.c When you need a resource did you your partner organization provide with opportunity?
 2. Please, describe the initial contacts between organizations?
 3. How did your organization do when it did not have enough information to make a decision?
 4. What was your perception of risk at the beginning of the project?
 5. Why your organization is collaborating with the other organization?
 6. What were the channels of communication used by the organizations to communicate?
 7. Can you give a general description about the quality of the collaborative relationship?
 8. What kinds of routines were developed between the organizations?
 9. How did your organization make agreements?
 10. When something unexpected happened that modified the agreements, what did your organization do?
 11. Does the objectives have changed over time? and How?
 12. What did your organization do to facilitate the integration process with the other organizations?

13. How did your organization manage and control the work of the project and what mechanisms were developed?
 14. How did your organization evaluate the collaborative effort and verify it was obtaining the expected results?
 - 14.a Did your organization get the expected results? What were those results?
 15. Please, describe the main stages in the project?
 16. How did your organization solve misunderstandings?
 17. What were the benefits of the project?
 18. Were there any negative consequences derived from the common project?
 19. If you did not have restrictions of any kind, what would you like to change in the project?
 20. Under what conditions would the project be abandoned?
- Do you have any question about my research?

Thank you very much.

APPENDIX I
DENDOGRAMS

Table 20

Dendrogram 1

A	1	R14B. Partners' creativity to find new solutions R14C. Partners' ability to solve unpredicted problems R14F. Partners' reciprocity R14G. Partners' reliability R14D. Partners' capacity to good inter-organizational relationships R14E. Partners' adaptability	
	22a	R3. Project's goals match organizational goals R8. Project results match original expectations R9B. Support from your partner organization	
	2b	R5. Level of integration achieved R6. Freedom to try new things R13D. Coordination by mutual agreement	
	2orphan	R13B. Coordination using standard procedures defined by agreement	
	33a	R12A. Dependency on your partners' skills R12B. Dependency on your partners' knowledge R12C. Dependency on your partners' resources R12D. Dependency on your partners' work	
	3b	R10C. Competence Significance R10G. Coordination Significance R10A. Trustworthiness Significance R10B. Commitment Significance R14A. Partners' expertise	
	3c	R10H. Complexity Significance R10I. Integration Significance R10F. Interdependence Significance	
	3orphan	R7. Your personal level of involvement R9A. Support from the staff in your organization	
	B	4	R11C. Different expectations R11D. Different needs R11A. Different points of view R11B. Different interests
		5	R1. Technological impact in the collaborative project R2. Level of difficulty in the collaborative project
6		R10D. conflict Significance R10E. Risk Significance	
7		R10J. Uncertainty Significance R4. Difficulty to obtain information R13C. Coordination by revising the collaborative plan	
orphan		R13A. Coordination by a set of routines	

Table 21

Dendrogram 2

AA	a	R14B. Partners' creativity to find new solutions R14C. Partners' ability to solve unpredicted problems R14D. Partners' capacity to good inter-organizational relationships R14E. Partners' adaptability R14A. Partners' expertise
	b	R14F. Partners' reciprocity R14G. Partners' reliability
	c	R12A. Dependency on your partners' skills R12B. Dependency on your partners' knowledge R12C. Dependency on your partners' resources R12D. Dependency on your partners' work
	d	R3. Project's goals match organizational goals R8. Project results match original expectations R9B. Support from your partner organization
	e	R5. Level of integration achieved R6. Freedom to try new things R13D. Coordination by mutual agreement R7. Your personal level of involvement
	f	R9A. Support from the staff in your organization R13A. Coordination by a set of routines R13B. Coordination using standard procedures defined by agreement
BB	g	R11C. Different expectations R11D. Different needs R11A. Different points of view R11B. Different interests
	h	R1. Technological impact in the collaborative project R2. Level of difficulty in the collaborative project
	i	R4. Difficulty to obtain information R13C. Coordination by revising the collaborative plan

APPENDIX J
LIST OF CONCEPTS

List of frequent concepts used by the interviewees and some examples.

agreement: good agreement with the other
agreement: Grantee agreements
agreement: money issues in writing
agreements: contracts
agreements: legal documents
agreements: licensing agreements
attitude: adaptation (adaptable behavior)
attitude: create the environment
attitude: too optimistic
attitude: very optimistic view
attitude: we let them be
attitude: we need to be sensitive to the other's needs
benefit: Diff. Collections
benefit: having the program (exhibit)
benefit: history of the community
benefit: long interest in providing access to the collection
benefit: long standing relationship
benefit: self-motivation
benefit: we have a web site
benefit: we learn
challenge: communication
champion: (coordinator) we usually talked to her and she was definitely the answer person
Champion: Coordinator puts everything in writing
change of expectations
Change of priorities: it has been little difficult; other partner restructuring and having budget cuts
change of staff
change resistance: we did not really want to change the way they were doing
change: contact person to coordinate when the staff change
change: Nothing unexpected happened
change: there were a lot of changes in the project
changes in the staff
changes over time
Changes: diff. Population is using it
changes: no
Characteristic of collaboration: it is just taking much more time that we anticipated
Characteristic of collaboration: it was a challenging project because it was so many different player so many people involved
commitment: allowing different levels of involvement was a strength
commitment: diff. Institutions offer different levels of support
commitment: diff. Levels of involvement
commitment: everybody is interested
commitment: few people involved in the project: it looks a start configuration
commitment: few people involved in the project: one person
commitment: few people involved in the project
Commitment: lack of commitment (few staff)
Commitment: lack of commitment from the rest of the organization
commitment: not institutional support
commitment: organization assigns one or two people only
commitment: personal commitment

commitment: s/he was the digital archivist working by him/herself
commitment: share commitment
commitment: start topology
commitment: the organization was me
commitment: top management give us support
commitment: we are going to take responsibility to do the planning and follow through
commitment: we understand that we are going to be involved
commitment: work independently
commitment; she does not know about other institutions
communication: centralized communication
communication: constant conversations
communication: not telling us what is going on
communication: poor communication
communication: she does not know about other institutions
communication: technology: list-server do not worked
communication: we just can go over there
complexity of the technology
complexity with technology cause misunderstandings
complexity: technology: list-server do not worked
complexity: Technology: Not successful website
complexity: Technology: outsource: the most cost-effective solution
complexity: work independently
conflict: it was not a lot of friction
conflict: no disagreements
conflict: One person who was nominated to the advisor council was very disruptive and very difficult person to work with and she (my partner) I work through that problem together
conflict: personal conflict
conflict: prejudice
conflict: prejudice
conflict: racism: having derogative slang expressions
conflict: Racism: images that have the potential to reflect some racism
conflict: there were some tensions
conflict: understanding
conflict: with the community: sabotage
contradiction
coordination
cultural sensitive material
cultural: difference
culture: organizational differences: (partner bureaucratic, slow, diff. communities)
culture: organizational differences: senior management do not have good relationship
delay hiring: everything started before she started her job
delay hiring
delay: for software
Delay: s/he arrived (hired) late to the project
delay: one year extension
delay
distance: 30 miles apart
distance: 9 miles
distance: distance: 50-80 miles
distance: geographically apart
distance: it's a five minutes drive

Distance: traveling took away form the regular job
distance: very close
distance: we are about one hour and fifteen minus away from the closest institution
distance: we are in the same building
distance: we are in the same city
distance: we are very close
distance: we just can go over there
distance: we're just down the street from us
emotion: frustrated with the museum
emotions: we feel frustrated sometimes
environment
evaluation: is the project useful to our users?
evaluation: We know we achieve what we wanted to achieve, but is it useful to our users?
expectations
expectations change
expectations: diff. Expectations
expectations: no expectations
grant management
grant: how to support the project in the future
grant: IMLS: I was told by the IMLS officials I did not have the opportunity to pull out once the project started because I was the principal investigator
grant: IMLS: I was told by the IMLS officials I did not have the opportunity to pull out once the project started because I was the principal investigator
grant: looking for a new grant
grant: money: how to support the project in the future
grant: the grant was the agreement
grant: the impact of the grant
grant
initiated by staff: project started as initiative of the staff
initiated by top management
integration of work
integration: city community
integration: everything started before she started her job
integration: gather in the lunch or stuff like that
Integration: giving sense of participation
Integration: my impression: the integration of staff to the projects were not smooth
Integration: no integration
Integration: not able to combine our cultures at any level above that
integration: she does not know about other institutions
Integration: we share the same visions
integration: we shared the same board for several years
integration: we were not able to articulate our expectations very well
integration: work independently
integration
interdependence
justification
Learning: learn from other projects
Learning: learn that it needs to be more fun
Learning: learn to collaborate
Learning: learning environment
Learning: learning process about technology

Learning: learning process
learning: we learn
learning: we learn
meetings: meetings for planning
meetings: meetings were not successful
meetings: not productive meetings
mission
misunderstanding: email misunderstanding (solve by phone)
misunderstanding: happen, and we sent an informal email or phone call
misunderstanding: low level of misunderstanding
misunderstanding: no major dissention
misunderstanding: not misunderstanding
misunderstanding: with technology cause misunderstandings
Negative consequences: a lot of disappointments
negotiation
number of partners: three partners
objective
org. culture: broke a tradition of close control (org. culture)
Partner: good partner
partners: partners working independently
policy
power: eliminating personal agenda
power: one organization
power: One person who was nominated to the advisor council was very disruptive and very difficult person to work with and she (my partner) I work through that problem together
power: Power asymmetric relationship
power: start topology
previous relationship: experience working together 1 and half year before
previous relationship: it's their first collaboration
previous relationship: previous experiences working together
previous relationship: Some of us have known each other for a long time, but we have not work together
previous relationship: the organizations have never work together before, but they are planning to continue working in the future
previous relationship: we have a long-standing relationship with the library
previous relationship: we have long history of working together
previous relationship: we have not work before with those partners. S/he does not know if one person has been working with them before
Previous relationship: we have previous experiences together
previous relationship: we knew the people, but we have not work before
previous relationship: we know each other for a long time
previous relationship: working together for a long time
problem: (potential problem) we the people, but we have not worked before
problem: changing the mindset
problem: consistency
problem: delays
problem: diff. Expectations
problem: Diff. Points of view
problem: distance could be a problem
problem: founding problem was not solve
problem: how to support the project in the future

problem: lack of technical background
problem: more responsibilities in the staff
problem: One person who was nominated to the advisor council was very disruptive and very difficult person to work with and she (my partner) I work through that problem together
problem: people without results or unacceptable work
problem: promising to do something and not doing it
problem: some difficulties
problem: staff change
problem: take care of the language that we use (racism)
problem: threads
problem: traveling took away form the regular job
problem: work flow problems
problems with agreements
problems with face-to-face communication
process: (objective) the whole idea of the project was to learn to able to deal with it in the future
process: a year in the project
process: activities
process: collaborative process
process: common evaluation
process: contact person to coordinate when the staff change
process: definition stage
process: eight months to have all the personnel
process: execution
process: facilitator for plans
process: facilitator for strategy
Process: good description
process: hired a project manager
process: hiring a facilitator to set goals
Process: in practice it has been sort of a client relationship
Process: independent help on decision-making those sort of things
Process: Independent
Process: initial contacts were informal
Process: late starting in the project
process: miss deadlines
process: networking
process: organization of work
process: organization
process: outsource: the most cost-effective solution
process: partners working independently
process: redefinition of conditions
process: talk about for several years
process: Training process
process: we did initially a pilot project
process: we did not do a good work documenting
process: we experienced a well-planned project
process: we have an independent evaluator
process: work activities
process: working process
process:
racism:
reason for collaboration: Diff. Collections

reason for collaboration: everybody is interested
Reasons for collaboration: we have experience
reasons: complementary skills
relationship was a little strength, but it turns out very well
relationship was bad with the other one
relationship was very good with one, bad relationship with the other one
relationship: future collaboration
relationship: gather in the lunch or stuff like that
Relationship: good relationship with one partner
relationship: great diff. With one of the partners
relationship: how we can work in the future
Relationship: it is a good collaborative relationship
relationship: miss deadlines
relationship: senior management does not have good relationship
relationship: we are planning to do more things in the future together
relationship: we have come to us asking us to do things from them and our program
relationship: we would like to work together again
Relationship: with one the relationship was very good, with the other one relationship was bad
relationship
resources: take advantage of the interns
risk
routines
rural community: scarcely populated rural community
rural community: we are the only show in town for art
rural community
staff change: contact person to coordinate when the staff change
staff change: everything started before she started her job
staff change: she didn't start the project from the beginning
staff change
success: (lost opportunities) we should achieve much more
success: better than we thought
success: future collaboration
success: how we can work in the future
success: it turns out very well
Success: it was a very logical and good project so it was very agreeable
success: Not successful website
success: we are planning to do more things in the future together
success: we are planning to work together in the future
success: we got the results we wanted
success: we have a web site
success: We know we achieve what we wanted to achieve, but is it useful to our users?
success: we would like to work together again
success
successful collaboration
successful project given the resources
successful project
support: involvement
technology: list-server does not worked
technology: we have a web site
technology
time

trustworthiness
type of collaboration: Multi-collaborative process
uncertainty
vision

APPENDIX K
INSTITUTIONAL REVIEW BOARD PERMISSION LETTERS

UNIVERSITY^{of} NORTH TEXAS

Office of Research Services

May 24, 2001

Miguel Angel Arroyo

Denton, TX 76201

RE: Human Subjects Application No. 01-095

Dear Mr. Arroyo,

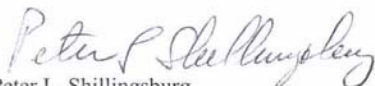
Your proposal titled "The Physiology of Collaboration, an Investigation of Library-Museum-University Partnership" has been approved by the Institutional Review Board and is exempt from further review under 45 CFR 46.101.

Enclosed is the consent document with stamped IRB approval. Please copy and **use this form only** for your study subjects.

The UNT IRB must review any modification you make in the approved project. **Federal policy 21 CFR 56.109(e) stipulates that IRB approval is for one year only.**

Please contact me if you wish to make changes or need additional information.

Sincerely,



Peter L. Shillingsburg
Chair
Institutional Review Board

PS:sb

UNIVERSITY OF NORTH TEXAS COMMITTEE FOR
THE PROTECTION OF HUMAN SUBJECTS

RESEARCH CONSENT FORM

Subject Name:

Date:

Title of Study: The Physiology of Collaboration, and Investigation of Library-Museum-
University Partnership

Principal Investigator: Miguel Angel Morales Arroyo

Co-investigators:

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the proposed procedures. It describes the procedures, benefits, risks, and discomforts of the study. It also describes the alternative treatments that are available to you and your right to withdraw from the study at any time. It is important for you to understand that no guarantees or assurances can be made as to the results of the study.

The purpose of the study is to identify factors that may affect the process of collaboration and possible collaborative stages. The study will last seven months approximately. Data will be collected in different institutions from two to three months approximately.

Libraries and museums are two different types of non-profit organizations that look similar in the Internet environment. Both entities are challenged to find the resources and skills to incorporate their assets into the technological mainstream. Collaboration with other organizations in order to overcome their limitations is an alternative. This research employs a multi-case study methodology, and the instruments used to collect data are interviews and questionnaires.

In general, there is not any kind of discomfort, inconvenient or risk involved in this study.

Try to understand the nature of collaboration will provide better results and reduce conflict and pressures among participants. This study is a small step in understanding the nature of collaboration.

The researcher or research assistant will collect all the data. They will be anonymous, used for the study only, and kept in a locked faculty office, and the participants will not be identifiable in any reports of publications.

APPROVED BY THE UNT IRB
FROM 5/24/01 TO 5/23/02
[Signature]

**UNIVERSITY OF NORTH TEXAS
RESEARCH CONSENT FORM (Continued)**

Review for protection of participants:

This research study has been reviewed and approved by the UNT Committee for the Protection of Human Subjects (940) 565-3940.

RESEARCH SUBJECTS' RIGHTS: I have read or have had read to me all of the above.

_____ has explained the study to me and answered all of my questions. I have been told the possible benefits and the absence of risks or discomforts involved in the study.

I understand that I do not have to take part in this study, and my refusal to participate or to withdraw will involve no penalty or loss of rights or benefits or legal recourse to which I am entitled. The study personnel may choose to stop my participation at any time.

In case there are problems or questions, I have been told I can call Miguel Angel Morales Arroyo

I understand my rights as a research subject, and I voluntarily consent to participate in this study. I understand what the study is about and how and why it is being done. I have been told I will receive a signed copy of this consent form.

Subject's Signature

Date

Witnesses' Signature

Date

For the Investigator or Designee:

I certify that I have reviewed the contents of this form with the person signing above, who, in my opinion, understood the explanation. I have explained the known benefits and risks of the research.

Principal Investigator's Signature

Date

REFERENCES:

- Aldenderfer, M. S., & Blashfield, R. K. (1984). *Cluster Analysis* (First printing ed.). Beverly Hills: Sage Publications, Inc.
- Ariño, A., & Torre, J. d. I. (1998). Learning from failure: Towards an evolutionary model of collaborative ventures. *Organization Science*, 9(3), 306-325.
- Axelrod, R. M. (1984). *The evolution of cooperation*: Basic Books
- Axelrod, R. (1997). *The Complexity of Cooperation*. Princeton, New Jersey: Princeton University Press.
- Axelrod, R., & Hamilton, W. D. (1981). The evolution of Cooperation. *Science*, 211, 1300-1306.
- Bachmann, R. (1988). Conclusion: Trust - Conceptual Aspects of a Complex Phenomena. In C. Lane & R. Bachmann (Eds.), *Trust Within and Between Organizations* . New York: Oxford University Press.
- Barge, J. K. (1994). *Leadership : communication skills for organizations and groups*. New York: St. Martin's Press.
- Berry, N., & Mayer, S. (Eds.). (1989). *Museum Education: History, Theory, and Practice*. Reston, Virginia: National Art Education Association.
- Blake, R. R., & Mouton, J. S. (1964). *The managerial Grid*. Houston, Tex: Gulf Pub. Co.
- Blau, P. M. (1964). *Exchange and Power in Social Life*. New York: John Wiley & Sons.
- Blau, P. M. (1974a). Social exchange. In P. M. Blau (Ed.), *On the Nature of organizations* (pp. 204-214). New York: John Wiley & Sons.
- Blau, P. M. (1974b). A theory of social integration. In P. M. Blau (Ed.), *On the Nature of organizations* (pp. 187-203). New York: John Wiley & Sons.

- Blumer, H. (1969). *Symbolic Interactionism Perspective and Method*. Englewood Cliffs, New Jersey: Prentice-Hall.
- Borg, I., & Lingoes, J. C. (1987). *Multidimensional similarity structure analysis*. New York: Springer-Verlag.
- Brown, D. W. (1995). *When Strangers Cooperate: Using Social Conventions to Govern Ourselves*. New York: The Free Press.
- Browning, L. D. (1995). Building cooperation in a competitive industry: sematech and the semiconductor industry. *Academy of management journal*, 38(1), 113-151.
- Buckland, M. (1992). *Redisigning Library Services*: American Library Association.
- Castell, A. B. (1988). Gateway to Better Health. *Business & Health*, 6(1), 16-17.
- Checkland, P. (1981). *Systems thinking, systems practice*. Chichester: John Wiley & Sons.
- Chisholm, D. W. (1989). *Coordination without hierarchy: informal structures in multiorganizational systems*. Berkeley and Los Angeles, California: University of California Press.
- Clark, D., & Morton, D. (1997). Quality as a common cause. *Journal for Quality & Participation*, 20(5), 54-55.
- CLIR. (2000). *Collections, Content, and the Web* (Pub88): Council on Library and Information Resources.
- Cook, J., & Wall, T. (1986). New measures of trust, organizational commitment and personal need of nonfulfillment. In J. L. Price & C. W. Mueller (Eds.), *Handbook of Organizational Measurement*. White Plains, N.Y.
- Coxon, A. P. M. (1982). *The user's Guide to Multidimensional Scaling* (First Edition ed.).

- Exeter, New Hampshire: Heinemann Educational Books.
- Curtis, R. S. (2001). Successful Collaboration Between Hospitals and Physicians: Process or Structure? *Hospital Topics: Research and Perspectives on Healthcare*, 79(2), 7-13.
- D'Aunno, T. A., & Zuckerman, H. S. (1987). A life-cycle model of organizational federations: The case of Hospitals. *Academy of management Review*, 12(3), 534-545.
- Deden, A. (1998). Computers and systemic change in higher education. *Communications of the ACM*, 41(1), 58-63.
- Doz, Y. L. (1987/1988). Technology Partnerships Between Larger and Smaller Firms: Some Critical Issues. *International Studies of Management & Organization*. 17(4): 31-57. 1987/1988, 17(4), 31-57.
- Doz, Y. L. (1996). The evolution of cooperation in strategic alliances: Initial conditions or learning processes? *Strategic Management Journal*, 17, 55-83.
- Doz, Y. L., & Hamel, G. (1998). *Alliance advantage - The art of creating value through partnering*. Boston, Massachusetts: Harvard Business School Press.
- Drucker, P. F. (1990). *Managing the non-profit organization* (First Edition ed.). New York: HarperCollins.
- Dunn-Rankin, P., Knezek, G., Wallace, S., & Zhang, S. (2002). *Scaling Methods* (Second Edition ed.). Mahwah, New Jersey London: Lawrence Erlbaum Associates, Publishers.
- Eden, C., Jones, S., & Sims, D. (1983). *Messing about in problems* (First ed.) (Vol. 1). Oxford: Pergamon Press.

- Emerson, R. M. (1962). Power-Dependence Relations. *American Sociological Review*, 27, 31-41.
- Everitt, B. (1980). *Cluster Analysis* (Second Edition ed.). London
New York: London : published on behalf of the Social Science Research Council
by Heinemann Educational Books ; New York : Halsted.
- Fayol, H. (1949). *General and Industrial Management* (Constance Storrs, Trans.).
London: Pitman.
- Foa, U. G., & Foa, E. B. (1974). *Societal Structures of the Mind*. Springfield, Illinois:
Charles C. Thomas.
- Gerardin, L. (1973). Morphological Analysis: A method for creativity. In J. R. Bright & M.
E. F. Schoeman (Eds.), *A guide to practical technological forecasting* (pp. 422-
457). New Jersey: Prentice-Hall.
- Govier, T. (1997). *Social Trust and Human Communities*. Montreal: McGill-Queen's
University Press.
- Govier, T. (1998). *Dilemmas of trust*. Montreal: McGill-Queen's University Press.
- Granovetter, M. (1985). Economic Action and Social Structure: the problem of
embeddedness. *American Journal of Sociology*, 91(3), 481-510.
- Gray, B., & Wood, D. J. (1991). Collaborative Alliances: Moving from Practice to Theory.
Journal of applied behavioral sciences, 27(1), 3-22.
- Guiot, J. M. (1977). Attribution and identity construction: some comments. *American
Sociological review*, 42, 692-704 (October).
- Harrel, P. F. (1996). Gold mines, pitfalls, and slag heaps: A case study of collaborative
projects at the University of Southern Indiana. *SRA Journal*, 28((1/2)), 21-28.

- Hart, S., & Mas-Colell, A. (Eds.). (1997). *Cooperation: Game-Theoretic Approaches*. Berlin, Germany: Springer. Published in cooperation with NATO Scientific Affairs Division.
- Hofstede, G. (1980). *Culture's consequences*. Beverly Hills, California: Sage Publications.
- Hollingshead, A. B. (1950). Cultural Factors in the Selection of Marriage Mates. *American Sociological Review*, 15(5), 619-628.
- Homans, G. C. (1974). *Social Behavior: Its Elementary Forms* (Revised Edition ed.): Harcourt Brace Jovanovich, Inc.
- Isenhardt, M. W., & Spangle, M. (2000). *Collaborative Approaches to Resolving Conflict*. Thousand Oaks, California, U.S.A.: Sage Publications, Inc.
- Ishikawa, K. (1985). *TQC to wa nani ka, Nihon-teki hinshitsu kanri. (What is total quality control? The Japanese way)* (David J. Lu, Trans.). Englewood Cliffs, N.J.: Prentice-Hall.
- Janis, I. L., & Mann, L. (1977). *Decision Making*. New York: The free press.
- Johnson, L. J., Zorn, D., Tam, B. K. Y., Lamontagne, M., & Johnson, S. A. (2003). Stakeholders' Views of Factors that impact Successful Interagency Collaboration. *Exceptional Children*, 69(2), 195-209.
- John-Steiner, V. (2000). *Creative Collaboration*. New York: Oxford University press.
- Juran, J. M., & Jr., F. M. G. (1970). *Quality planning and analysis: from product development through usage*. New York: McGraw-Hill.
- Kaplan, B. (1998). Willow Clinic: Recipe for successful collaboration. *Healthcare Forum Journal*, 41(3), 48-51.

- Katz, D., & Kahn, R. L. (1966). *The Social Psychology of Organization*. New York: Wiley.
- Keil, M., Cule, P. E., Lyytinen, K., & Schmidt, R. C. (1998). A framework for identifying software project risks. *Communications of the ACM*, 41(11), 76-83.
- Keil, M., & Ramiro, M. (2000). Cutting your losses: Extracting your organization when big project goes awry. *Sloan Management Review*, 41(3), 55-68.
- Keil, M., Tan, B. C. Y., Wei, K.-K., Saarinen, T., & al., e. (2000). A cross-cultural study on escalation of commitment behavior in software projects. *MIS Quarterly*, 24(2), 299-325.
- Kouzes, J. M., & Posner, B. Z. (2002). *Leadership the Challenge* (Third Edition ed.). San Francisco, CA: Jossey-Bass.
- Krathwohl, D. R. (1997). *Methods of educational & social Science research: An integrated approach (2nd ed.)*. White Plains, New York: Longman (2nd ed. ed.). White Plains, New York: Longman.
- Kreiner, K., & Schultz, M (1993). Informal collaboration in R & D. The formation of networks. *Organizational Studies*, 14(2), 189-209.
- Kruskal, J. B., & Wish, M. (1978). *Multidimensional Scaling* (First Printing ed.). Beverly Hills. London: Sage Publications, Inc.
- Kumar, K., & van Dissel, H. G. (1996). Sustainable collaboration: Managing conflict and cooperation in interorganizational systems. *MIS Quarterly*, 20(3), 279-300.
- Kumar, K., van Dissel, H. G., & Bielli, P. (1998). The merchant of Prato--revisited: Toward a third rationality of information systems. *MIS Quarterly*, 22(2), 199-226.
- Lane, C. (1988). Introduction: Theories and Issues in the Study of Trust. In C. Lane & R.

- Bachmann (Eds.), *Trust Within and Between Organizations*. New York: Oxford University Press.
- Lee-Mortimer, A. (1993). A dynamic collaboration. *Tqm Magazine*, 5(5), 31-34.
- Lewis, D. K. (1969). *Convention I A Philosophical Study*. Cambridge, Massachusetts: Harvard University Press.
- Mattessich, P. W., & Monsey, B. R. (1992). *Collaboration: What Makes It Work*. St. Paul, Minnesota: Amherst H. Wilder Foundation.
- Mayo, E. (1945). *The Social Problems of an Industrial Civilization*. Boston: Harvard University.
- McGregor, D. (1960). *The Human Side of the Enterprise*. New York: McGraw-Hill.
- Merril, D. W., & Reid, R. H. (1981). *Personal styles and effective performance*. Radnor, Pennsylvania: Chilton Book Company.
- Meyer, H.-D. (1993). The cultural gap in long-term international work groups: A German - American case study. *European Management Journal*, 11(1), 93-101.
- Mills, C. W. (1956). *The power elite*. New York: Oxford University Press.
- Mintzberg, H., Jorgesen, J., Dougherty, D., & Westley, F. (1996). Some surprising things about collaboration -- knowing how people connect makes it work better. *Organizational Dynamics*, 25(1), 60-71.
- Mizuno, S. (Ed.). (1988). *Management for quality improvement: The seven new QC Tools (Kanriisha to sutaffu no shin QC nanatsu-d̄ogū)*. Cambridge, Massachusetts: Productivity Press.
- Morales-Arroyo, M. A. (1993). *Relaciones Informales de Poder en una Organización [Informal Power Relationships in an Organization]*. Unpublished Master Degree,

- Universidad Nacional Autónoma de México, Ciudad Universitaria, México D.F.
- Morrow, P. C. (1993). *The theory and measurement of work commitment*. Greenwich, Conn.: JAI Press.
- Mowday, R., & Steers, R. M. (1986). The Measurement of Organizational Commitment. In J. L. Price & C. W. Mueller (Eds.), *Handbook of Organizational Measurement*. White Plains, N.Y.
- Najam, A. (2000). The four C's of third sector - government relationships cooperation, confrontation, and co-optation. *Nonprofit Management & Leadership*, 10(4), 375-396.
- Nock, S. L. (1993). *The Costs of Privacy - Surveillance and Reputation in America*. New York: Walter de Gruyter, Inc.
- Novak, J. D. ((n.d.), 11/01/2000). *The theory underlying concept maps and how to construct them*, [The Internet]. Institute for human and machine cognition (IHMC). Available: <http://cmap.coginst.uwf.edu/info/> [2000, 11/10].
- Ohlinger, J., Brown, M. S., Laudert, S., Swanson, S., & Fofah, S. (2003). Development of Potentially Better Practices for the Neonatal Intensive Care Unit as a Culture of Collaboration: Communication, Accountability, Respect, and Empowerment. *Pediatrics*, 111(4), 471-481.
- Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations*. New York, N.Y.: Harper & Row.
- Rackham, N., Friedman, L., & Ruff, R. (1996). *Getting partnering right*. New York: McGraw-Hill.
- Ring, P. S. (1996). Fragile and resilient trust and their role in economic exchange.

- Business & Society*, 35(2), 148-175.
- Ring, P. S., & Ven, A. H. V. d. (1992). Structuring cooperative relationships between organizations. *Strategic Management Journal*, 13(7), 483-498.
- Ring, P. S., & Ven, A. H. V. d. (1994). Developmental processes of cooperative interorganizational relationships. *Academic Management Review*, 19(1), 90-118.
- Roloff, M. E. (1981). *Interpersonal Communication - The Social Exchange Approach* (First Printing ed.). Beverly Hills, California: Sage Publications, Inc.
- Schelling, T. C. (1978). *Micromotives and Macrobehavior*. New York: W W Norton & Company.
- Schrage, M. (1990). *Shared Minds - The New Technologies of Collaboration*. New York: Random House.
- Shapiro, S. P. (1987). The social control of impersonal trust. *American Journal of Sociology*, 93(3), 623-658.
- Shepard, R. N., Rommey, A. K., & Nerlove, S. B. (Eds.). (1972). *Multidimensional scaling; theory and applications in the behavioral sciences*: New York, Seminar Press.
- Sheppard, B. (2000). *The 21st Century Learner*, [Internet]. IMLS. Available: www.imls.gov/pubs/pubs_pub.html [2001, March 15].
- Simon, H. A. (1973). The structure of ill Structured Problems. *Artificial Intelligence*, 4(1), 181-201.
- Smith, K. G., Carroll, S. J., & Ashford, S. J. (1995). Intra- And Interorganizational Cooperation: Toward a Research Agenda. *Academy of Management Journal*, 38(1), 7-23.

- Smith, P. (1998). Conflict can lead to success. *Trustee*, 57(7), 26-27.
- Smith, W. E. (1992). Power in the Design, Management, and Evaluation of Organizations. In J.-M. Choukroun & R. M. Snow (Eds.), *Planning for Human Systems* (pp. 374-392). Philadelphia: Bush Center, the Wharton School of the University of Pennsylvania.
- Spitzberg, B. H., & Cupach, W. R. (1984). *Interpersonal communication competence*. Beverly Hills: Sage Publications.
- Sydow, J. (1988). Understanding the Constitution of Interorganizational Trust. In C. Lane & R. Bachmann (Eds.), *Trust Within and Between Organizations*. New York: Oxford University Press.
- Sydow, J. (1998). Understanding the constitution of interorganization trust. In C. Lane & R. Bachmann (Eds.), *Trust within and between organizations* (pp. 31-63). New York: Oxford University press.
- Thibaut, J. W., & Kelley, H. H. (1959). *The Social Psychology of Groups*. New York: John Wiley & Sons, Inc.
- Thomas, J. B., Ketchen Jr., D. J., Trevino, L. K., & Jr, R. R. M. (1992). Developing Interorganizational Relationships in the Health Sector: A Multicase Study. *Health Care Management Review*, 17(2), 7-19.
- Thompson, J. D. (1967). *Organizations in action : Social science bases of administrative theory*. New York.
- Ullberg, A. D., & Ullberg, P. (1981). *Museum Trusteeship*. Waxhington, D.C.: American Association of Museums.
- Ven, A. H. V. d. (1976). On the nature, formation, and maintenance of Relations among

- organizations. *Academy Management Review*, 1, 24-36.
- Walster, E. H., Walster, G. W., & Berscheid, E. (1978). *Equity: Theory and Research*. Boston, Massachusetts: Allyn and Bacon, Inc.
- Westley, F., & Vredenburg, H. (1991). Strategic Bridging: the collaboration between environmentalists and business in the marketing of green products. *Journal of applied behavioral sciences*, 27(1), 65-90.
- Wheless, V. E., & Lashbrook, W. B. (1987). Style. In J. C. McCroskey & J. A. Daly (Eds.), *Personality and Interpersonal Communication* (pp. 243-272). Newbury Park, Calif.: Sage Publications.
- Winer, M., & Ray, K. (1994). *Collaboration Handbook* (Fourth Printing, October 1997 ed.). Saint Paul, Minnesota: Amherst H. Wilder Foundation.
- Wood, D. J., & Gray, B. (1991). Toward a comprehensive theory of collaboration. *Journal of applied behavioral sciences*, 27(2), 139-162.
- York, A., & Zychlinski, E. (1996). Competing Nonprofit Organizations also Collaborate. *Nonprofit Management and Leadership*, 7(1), 15-27.
- Zand, D. E. (1997). *The leadership Triad - Knowledge, Trust, and Power*. New York: Oxford University Press.
- Zwicky, F. (1969). *Discovery, Invention, Research - Through the Morphological Approach*: The Macmillan Company.