AN EXPLORATION OF THE ANTECENDENTS OF INTERORGANIZATIONAL TRUST: EXAMINING THE TRUST PLACED IN VENDORS CONDUCTING OUTSOURCED CLINICAL TRIALS

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Attempts to create integrated models of individual trust have been successful, but few of these models have been extended to the interorganizational context. This exploratory project examines the question of whether interorganizational trust exists and explores its antecedents. Using exchange and agency theories, antecedents of interorganizational trust are predicted. The resulting model suggests two exogenous and independent variables (*successful prior ties*, *positive reputation*) that have a mediated relationship with the dependent variable (*interorganizational trust).* The mediating and independent variables (*competence, efficacy, benevolence, values consistency and values compatibility*) are the direct antecedents of interorganizational trust. The model is tested with data from outsourced clinical trial relationships and shows that, in large part, the predicted relationships are supported with only a few exceptions. The unsupported relationships are those that contained a construct not likely to be tracked or measured by the organizations in question (e.g. benevolence, values compatibility). The tests also show that the predicted relationship between successful prior ties and interorganizational trust, and positive reputation and interorganizational trust are fully mediated by the other variables. This finding helps clarify the uncertain role of prior ties and reputation in the trust literature. Finally the introduction of control variables reveals that features like type of firm, authority level of the organizational representatives, and preferred vendor status matter in predictions of interorganizational trust.

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The final group that deserves recognition is also my most consistent source of support. Anyone who is familiar with me knows that I am speaking of my family. My parents, Carl and Carolyn Caldwell, have been behind me every day of my life. Their love, support is responsible for who I am. They were readily able to empathize with my experience as a doctoral candidate as both have experience the exhilaration and frustration of graduate education. Some may be surprised to know that my in-laws, Bob and Marsha Thompson, played a helpful role in the dissertation. Anyone who knows my in-laws is not surprised by this fact. First, they let me marry their daughter with little more than the promise that some day I might have a job. Second, my mother-in-law's superb editing relieved a lot of pressure in the days leading up to the dissertation defense.

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CHAPTER I - INTRODUCTION

Can trust exist at the organizational level? Or, is trust an activity that only exists at the individual level? Can organizations be the focus of trust? Or, are people the only appropriate entities in which to place our trust? Despite widespread use of trust as an organization level construct, little theoretical or empirical evidence exists to answer these questions.

The goal of this study is to discover whether trust exists at the organizational level of analysis and, if so, to explore its antecedents. Specifically, the study creates and tests an organizational level theory that posits that certain variables predict the trust one organization has for another organization. This concept is often referred to as interorganizational trust. The variables that are necessary for predicting this organization level phenomenon include competence, efficacy, benevolence, values consistency, and values compatibility.

Example of Interorganizational Trust

Much of the trust literature deals only with individual level trust or assumes that trust exists at the organizational level. Few studies specifically propose and test an organizational level theory of trust. Yet, practitioner literature is full of references to organizations that trust or distrust each other. For example, the Firestone tire recall and its relationship to Ford's popular Explorer model illustrates the use of language that implies the violation of interorganizational trust (Grimaldi & Swoboda, 2000). Although

the facts of the case have been extensively covered in the media, a refresher of the particulars is in order.

The number of rollover accidents involving Ford Explorers was enough to gain the attention of safety officials[1]. When the issue was first identified as a problem, the investigation focused on the Firestone tires that were commonly installed on new Explorers. As the controversy grew, concerns surfaced regarding the safety of the vehicle as well as of the tires. The specter of class action liability suits caused two firms, who have an historically strong relationship dating back to 1906, to blame each other for the problem. Firestone contended that while tires may go flat, the design of the vehicle caused the deadly rollovers. Ford contended that rollovers in Explorers were no more common than for any other SUVs, implying that the real safety issue was Firestone's tires.

Recently, Firestone has taken the unprecedented step of notifying Ford that it will no longer sell tires to Ford. In an excerpt from the letter sent by Firestone's CEO Lampe to Ford's CEO Nasser, Lampe said,

> "Business relationships, like personal ones are built upon trust and mutual respect. We have come to the conclusion that we can no longer supply tires to Ford since the basic foundation of our relationship has been seriously eroded (Bradsher, 2001)."

While both sides have studies and statistics that support their contentions, the effect of the charges and countercharges has caused the historically strong relationship between Firestone and Ford to be severed. While existing contracts are still being honored, most of Ford's new Explorers are equipped with non-Firestone tires.

Furthermore, Firestone has threatened to involve Ford in legal cases where substantial settlements may be required.

The compelling aspect of this story is that the historical trust between the two firms is not interpersonal. Henry Ford and Harvey Firestone, founders of their respective firms, created the Ford/Firestone relationship and appear to have had an intense personal relationship and affinity for one another. However, the firm's founders are not alive and the vendor/customer relationship that exists today transcends any personal relationship between Nasser and Lampe. Additionally, no specific individual caused the existing rift and subsequent lack of trust between the two firms. In a hypothetical exercise, asking a Ford dealer if he/she trusts Firestone would likely garner a negative response. This negative response not only would be common to others, but also has manifested itself in a company policy that promotes avoiding the use of Firestone products. Thus, dealers and others at Ford who have almost no direct contact with the employees of Firestone distrust their former partner. Ford's lack of trust is focused on Firestone as an organization, and not on any particular employee of Firestone.

Despite the presence of these types of real world examples, interorganizational trust remains an understudied concept. The Firestone/Ford rift exemplifies the factors that can create or destroy trust in an organization and serves to illustrate that interorganizational trust goes beyond interpersonal trust. The theory chapter will illustrate these variables.

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[1] Coverage of this issue was widespread. For some examples of articles that describe the issue see Grimaldi & Swoboda (2000), McCracken & Audi (2000) and Bradsher (2001).

Theoretical Debate

Much like the debate about organizational behavior, scholars who study trust seem to be torn as to whether trust can exist at the organizational level of analysis. Some scholars suggest that trust is the domain of individuals. Yet these scholars also note that the,

> "fundamental challenge in conceptualizing the role of trust in economics exchange is extending an inherently individual-level phenomenon to the organizational level of analysis (Zaheer, McEvily, & Perrone, 1998, p.141)."

The difficulty of conceptualizing organizational trust is reinforced in a recent review of the literature. In the following quote, Kramer (1999) notes both the difficulty of the levels issues and the general confusion of the extant literature. Kramer states that,

> "...an integrative theory of organizational trust continues to elude researchers. Relatedly, while empirical evidence continues to accumulate at a rapid rate, there has been a dearth of studies using overarching concepts and multiple-level measures that might help bridge the increasingly diverse conceptions of trust represented by economic, sociological, and social psychological perspectives (1999, p.594)."

Still other scholars unequivocally state that trust can exist at an organizational level. One example is Hagen & Choe's (1998) suggestion that organizational level trust is at work when a bank has considerable turnover of lending officers. Despite the employee turnover, the bank extends additional loans to a particular customer without requiring additional documentation from the customer. If trust existed only at the individual level of analysis then presumably the bank's new loan officer would have to completely reassess his/her clients subsequent to the departure of the former loan officer.

Research Significance

Managers have been told that trust is good for organizational performance (Zaheer et al., 1998), creating a firm's competitive advantage (Barney & Hansen, 1994), building cooperative governance structures (Larson, 1992; Ring & Van de Ven, 1992), and a host of other beneficial outcomes. The message to managers has been to create trust where it does not exist and conserve trust where it does exist[2]. Despite the increasing amount of research on trust, little of it characterizes the trust that may exist between two organizations. Further, there are few if any studies that empirically establish the antecedents for trust between two parties[3].

The paucity of both theoretical and empirical research in the study of interorganizational trust makes it difficult to counsel managers in the creation of a commodity that scholars are advocating as beneficial. It is also difficult to make claims suggesting the benefits of trust with only an interpersonal conceptualization of trust. This study will remedy this paucity by creating a theory of organizational trust and empirically testing it.

Outline of the Dissertation

Chapter two discusses the literature relevant to a study of organizational trust. Included in this review are discussions of the definitions of trust and the distinction between trust as a rational choice and trust as a relational construct. The remainder of the

[2] Wicks, Berman & Jones (1999), who point out that trust is not an unconditional good, offer one exception to this sentiment. Instead, they suggest that certain circumstances warrant the development of trust, whereas other circumstances require less trust or even distrust.

chapter is dedicated to examining trust at different levels of analysis as described in the extant literature.

Chapter three articulates the development of a theoretical model and draws from introduction of levels issues presented in Chapter two. However, before it does, a discussion of exchange theory is offered to help ground the subsequent model. Exchange theory presents an excellent way to understand the motivations for and means of interacting with others. After the discussion of exchange theory, constructs that predict organizational trust are presented from two levels of analysis: individual and organizational.

Chapter four offers a discussion of how the study's theory will be tested. Items included in the chapter include a review of the study's empirical setting, statistical methods, constructs, and survey instrument.

Chapter five includes the results of the study. Descriptive statistics of each variable are offered and the statistical relationship of the independent and dependent variables is presented and analyzed.

Chapter six, the concluding chapter, will complete the study by discussing its findings. Included in this discussion will be thoughts on the study's limitations and unusual findings. In addition, this chapter will offer some thoughts on future research on drug development processes, and on organizational trust. Other study items included subsequent to Chapter six are a listing of the study's references, tables, figures, and a copy of the study's survey instrument.

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[3] For two notable exceptions see Gulati (1995) and Zaheer, McEvily & Perrone (1998).

CHAPTER 2 - LITERATURE REVIEW

Background

The theory created in this study operates at the organizational level of analysis. Some of the grist for the construction of this theory is based on the extant literature. Therefore, the subsequent literature review is presented in a levels-of-analysis format. After introducing various definitions of trust and discussing the implications of these definitions, the literature relevant to the individual level of analysis is presented. A discussion of the trust literature that describes organizational theory and sociological aspects of trust will follow this.

Definitional Issues

Existing Definitions

In the development of any construct, scholars call for the creation and use of a common definition. The literature on trust is no exception. An analysis of the trust literature reveals many definitions of trust. In the case of trust, this condition is not entirely negative. There are two reasons why multiple definitions of trust exist: one reason is appropriate, the other reason needs to be remedied. An appropriate justification for the number of definitions is that scholars like Butler (1991) and Kramer (1999) describe trust as multidimensional constructs. Some of these dimensions will be discussed shortly. The less appropriate reason for the large number of definitions is that trust has been a popular construct in diverse disciplines such as psychology, political science, sociology, organizational studies, and economics. Due to its popularity and lack of integration among disciplines, definitions of trust have been created without

knowledge of established and useable definitions. Thus, some convergence on a common definition is appropriate.

The definitions in Table 1 demonstrate how the understanding of trust has progressed through time. The definitions also reveal the contexts in which trust has been used. Trust, depending on the scholars and their school of thought, is conceived in different ways. Kramer (1999) has provided a categorization of trust in his extensive review of the literature. He notes that trust can be conceived as a *psychological state* or as a *choice behavior*. Of the definitions listed in Table 1, most fall into the category of *trust as a psychological state*. In this category, trust is an individual level construct that involves vulnerability, risk, and uncertainty. This description of trust is evident in definitions 3 (Cummings & Bromiley, 1996) and 5 (Mayer, Davis, & Schoorman, 1995) from Table 1. These definitions make specific reference to trust as a belief, and trust as a willingness. Both of these words are critical in suggesting the trustor's psychological state. Kramer also suggests that there are definitions that convey a *generalized expectancy* about others. This description applies to definitions 1 (Rotter, 1967), 7 (Hagen et al., 1998) as these two definitions refer to the trustor's expectations of others.

Kramer's (1999) other category, *trust as a choice behavior*, describes how trust is manifested in behaviors. Within this category, Kramer makes a further distinction between *trust as a rational choice* and *relational trust*. When trust is considered through the lens of rational choice theory, there are expectations of rationality and calculativeness. The trustor is presumed to make calculations about intentions, abilities, outcomes, or

some combination of these[4]. This description applies to definition 2 (Gambetta, 1988) from Table 1 because of its focus on probabilities and its self-interested orientation.

Kramer's *relational trust* category comes from the sociological perspectives advanced by scholars like Granovetter (1985). Trust is construed to be a critical component to and an outcome of the embedded relationships Granovetter describes. Although definitions 4 (Hosmer, 1995), 5 (Mayer et al., 1995) and 6 (Zaheer & Venkatraman, 1995) allude to aspects of *relational trust*, none of these definitions really captures the full conceptualization of *relational trust*. Kramer says the following about *relational trust*:

> "trust needs to be conceptualized not only as a calculative orientations toward risk, but also a social orientation toward other people and toward society as a whole (1999 p.573)."

Based on this description of *relational trust's* components, it is clear that there is a need for a definition that can do justice to this category of work on trust.

Definitional Deconstruction

To better understand the distinctions between definitions of trust, five criteria relevant to trust are proposed. These criteria were used to deconstruct the commonly used definitions of trust presented in Table 1. The deconstruction of the definitions is presented here as Table 3. Each column in Table 3, with the exception of the column identifying the author's name, represents an essential criterion for any definition of trust. The justification for these criteria is highlighted in the admonitions of Mayer et al (1995) and Kramer (1999), and in this study's use of social exchange theory. For example,

[4] Some scholars take issue with the notion that calculativeness can exist in an act of trust. March & Olsen (1989) and Williamson (1996) both suggest that if an actor calculates a favorable probability associated

Mayer et al (1995) note that in order to improve the extant literature on trust, more attention needs to be paid to the referents of trust and that often; only one side of the trust relationship is considered.

In order to systematize the admonitions of these authors and integrate the relevant aspects of social exchange theory, this study concluded that five questions should be answered in each definition. These questions include: *Who are the actors involved in the exchange? What preexisting conditions must be in place for the exchange to occur? What are the appropriate actions of the trustor? What are the appropriate actions of the trustee? What is the context in which these actions take place?* These questions help address the important aspects of trust and also help frame the exchange.

Who are the actors involved in the exchange?

The first criterion for a definition of trust is particularly important for this study as it addresses who is involved. As this is a multilevel examination of trust, the definition of trust should be capable of addressing multiple levels of analysis. Whatever definition of trust this study uses or develops should address trust's ability to operate at the individual and organizational levels of analysis. One thing that is clear from the definitions of trust is that the referent of trust is often ambiguous. Words like *agent, party, partner* and *another* are used to identify the referent of trust. Because of the ambiguity of these words, the reader is often uncertain whether an agent is an individual or an organization.

The ambiguity of the referent is both helpful and burdensome to those writing about trust. While a given definition of trust can be used for both organizational and

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with an outcome, then trust does not play a role. For these scholars, trust is the absence of calculating behavior. Lewis & Weigart (1985) make a similar claim suggesting that trust is a leap beyond reason.

individual settings, care must be exercised to avoid cross-level fallacies that result from anthropomorphizing human behavior.

What preexisting conditions must be in place for the exchange to occur?

The second criterion important in a definition of trust is that it should address any operant (antecedent-like) state necessary for further action by the trustor or trustee. To understand this criterion, consider the following example. Two managers within a firm are responsible for outsourcing. One of the managers is somewhat trusting by nature and the other manager is somewhat distrusting by nature. Clearly, if one of the managers is more optimistic about the prospects for trust, then the trust between that manager and his counterpart with the firm conducting the outsourced work is a function of his predisposition and not a function of the relationship. Zaheer, McEvily & Perrone (1998) have referred to this as *dispositional* trust, while Rotter (1967) and Mayer, Davis & Schoorman (1995) refer to it as the *propensity to trust.*

In the aforementioned example, the dispositional trust is a psychological state as it deals with an individual's preconceived notions about trust. Dispositional trust is not a function of the relationship between the trustor and the trustee; it is a personality trait or a between-party factor that affects trust (Mayer et al., 1995). One could conceivably have an opinion about the prospects for trust without having any specific exchange partner in mind. While this is an important variable when considering trust without a specific other, this study makes use of a specific other as the referent of trust. Not only does this study use a specific other, it also is concerned with between-party factors that impact trust. This is characterized by many scholars (Hosmer, 1995; Mayer et al., 1995; Whitener, Brodt, Korsgaard, & Werner, 1998) as interpersonal relational trust.

In the deconstruction of the definitions, this quality of relational trust is referred to as an *operant state*. The operant state is a between-party precondition of the trustor and is a function of the expected exchange with the trustee. In other words, the trustor has a mental expectation about the exchange and operates based on that expectation.

What are the appropriate actions of the trustor?

This criterion stipulates that the trustor takes some action or engages in a certain behavior as her part of the exchange. The action required of the trustor in this case is to rely on or make himself/herself vulnerable to the trustee. For example, if the trustor relies on the word of the trustee, then the exchange may proceed. If, however, the trustor does not rely on the work of the trustee, then most likely the exchange will be cancelled, or modified (e.g., extraordinary levels of contracting or monitoring) in such a way that trust is no longer a necessary component of the exchange.

What are the appropriate actions of the trustee?

This criterion stipulates that the trustee, in an attempt to gain the trust of the trustor, or perhaps having already gained it, will engage in certain behaviors. If the trust of the trustor has not been secured, the trustee might offer promises regarding future behavior. All of the definitions that address both this criterion and the criterion stipulating the actions of the trustor are ordinal. The definition by Rotter (1967) implies that the trustee acts first by offering a promise. The trustor relying on the trustee's promise follows this act. The definitions by Mayer et al (1995), Zaheer & Venkatraman (1995) and Hagen & Choe (1998) suggest a trustor action first. The trustor allows for his own vulnerability or establishes requirements. Subsequently, the trustor fulfills his obligation by engaging in actions important to the trustor or upholding his commitments

in a spirit of cooperation. The Mayer et al (1995), Zaheer & Venkatraman (1995), and Hagen & Choe (1998) definitions are preferable in that they are more specific about the acts that fulfill the agreement. For example, good faith is exhibited or a duty is accepted. By contrast, Rotter's (1967) definition is mute with respect to the behavior that actually fulfills the exchange.

What is the context in which these actions take place?

The last criterion describes the relevant context with which the exchange takes place. This is important for a definition of trust to address as it can help justify the need for trust in the exchange. For example, the exchange may take place in an environment where monitoring is difficult and opportunism is possible or in an environment where the future is uncertain. These qualities help the definition justify the need for trust in a way that simply knowing that the parties are involved in a joint endeavor does not address.

As Table 3 indicates, many of the trust definitions lack some element that the aforementioned questions suggest are important in this study of trust. In some cases, the context of action is unstated; while in other definitions, the actions of the trustor are not well specified. Only two of the trust definitions possess qualities that allow them to address the relevant questions regarding trust and the parties involved. These two definitions will be discussed in greater detail in the forthcoming chapter that discusses this study's theoretical underpinnings.

Levels Issues

In addition to looking at the extant trust literature by the definitions it uses, it is helpful to look at it through a levels-of-analysis framework. Level of analysis is just one

of many contextual issues. But it is a contextual issue that many scholars have suggested deserves greater attention. One example of a call for attention to levels has been issued by Cherry, who says,

> "Identifying the level at which trust is evaluated can reduce the difficulty that surrounds the multiple conceptualizations of trust (2000 p.4)."

Despite this call for care in considering context, many of the trust definitions are vague as to the specified level of analysis. These definitions use words such as "agent" or "other", both of which can be construed to be individuals, organizations or groups. Other definitions attempt to address many levels of analysis by using words such as individual, collective belief, and group in the same definition, yet they operationalize trust using psychological language indicative of the individual level of analysis. Although the definitions of trust are not always clear regarding the focal level of analysis, it is still possible to glean from these papers the level these scholars are researching. In order to understand the trust literature in greater detail, the next section of the literature review will be delineated on the basis of level of analysis.

Trust at Individual Level of Analysis - Beginnings

Most of the initial work on trust is presented in psychology journals from the 1960s and early 1970s. The focus of this work is interpersonal trust and can be broken down into two categories: research on trust in a specific other (Butler, 1991; Ellison & Firestone, 1974; Johnson-George & Swap, 1982; Larzelere & Huston, 1980; Rempel & Holmes, 1986; Rempel, Holmes, & Zanna, 1985; Rubin, 1970) and research on individual differences in the predisposition to trust or trust in a generalized other (Deutsch, 1958;

Deutsch, 1960a; Deutsch, 1960b; Rotter, 1967). Scholars like Gabarro (1978) integrated these two perspectives by describing how subjects move from a generalized trust for others to a relational form of trust in a specific other[5].

Much of the recent work in business and economic journals builds on the literature concerned with trust in a specific other. This body of work has examined the role that trust plays between a trustor and a trustee. The typical study involves a trustor and a trustee that are familiar with one another. A typical example of this kind of research discusses the role of trust between managers and their subordinates (Argyris, 1964; Brockner, Siegel, Daly, Tyler, & Martin, 1997; Davis, Schoorman, Mayer, & Tan, 2000; Hosmer, 1995). As noted earlier, these studies assume that the employees (trustors) have at least some knowledge of those they work for (trustees).

Trust at Individual Level of Analysis – Antecedents

Trust literature at the individual level of analysis is prolific. In this body of work, a great deal of effort has been expended to identify and describe the antecedents of trust. Since trust is almost uniformly considered to have potentially desirable outcomes[6], scholars are understandably eager to explore the factors that lead to the creation of trust.

Mayer, Davis and Schoorman's (1995) review of the trust literature provides the most extensive list of antecedents to date. Their list has been updated with more recent work on trust and is presented here as Table 2. Mayer et al (1995) brought clarity to the subject of trust's antecedents by culling a few broad variables out of a list of

[5] Although it is not a part of this study, there is a recognized need to continue with integration efforts like Gabarro's (1978) so that we can better understand how trust develops over time.

[6] Recently, there have been attempts to explore the sinister side of trust. This perspective suggests that too much trust can lead to suboptimal outcomes. For a discussion of "optimal" levels of trust, see Wicks, Berman & Jones (1999).

approximately 25 antecedents drawn from the literature. This attempt to systematize the list of antecedents is valuable for helping to make sense of the work that has already been conducted.

Individual Level Work

What is apparent from the forgoing analysis is that the interpersonal level of analysis is the most highly developed body of literature. There are a few articles in this vast amount of literature that help establish the foundation upon which this study's test of interorganizational trust is built.

Any examination of interorganizational trust at this point is likely to be somewhat exploratory as there are only a handful of organization level empirical studies (e.g. (Cummings et al., 1996; Zaheer et al., 1998). However, the exploratory approach does not negate the use of excellent examples of interpersonal trust research.

The organization-level studies by Cummings & Bromiley (1996) and Zaheer, McEvily & Perrone (1998) suggest that the use of variables that originate at the individual level of analysis are both appropriate and feasible. Both of these studies rely on variables that are drawn from the individual level of analysis. Further, both studies pay homage to the fact that in forming trust, individual-to-individual interaction is the first step. This interaction commences the process of building interpersonal trust that is later converted into an organizational level construct. With the importance of individual level trust established, the next step is to choose from the best of the individual literature to create an accurate picture of organizational level trust.

As previously noted, the literature on individual level trust is extensive. However, it is not necessary to examine all of the antecedents that have been discussed. In Mayer,

Davis & Schoorman's (1995) development of a model of trust, the authors systematically reviewed the antecedents of trust in the extant literature. Thus, their work is a good place to begin an examination of individual level trust.

The basic model of interpersonal trust developed in Mayer, Davis & Schoorman (1995) uses three distinct and additive antecedents to predict interpersonal trust. The model Mayer et al created was empirically tested in subsequent efforts and shown to be valid (Davis et al., 2000; Mayer & Davis, 1999a). The variables that have a direct relationship in predicting trust are *ability*, *benevolence* and *integrity*. This collection of variables has an intuitive appeal. This appeal is enhanced by the authors' efforts to describe various trust scenarios that support their model. In these scenarios, the presence and absence of the variables was altered. The altered mix of variables supported the fact that when all three variables are present at high levels, trust results.

The work that Mayer and his colleagues have done to develop the model is admirable. However, one factor that is not included in their work is a theoretically based discussion and generation of variables relevant to trust. Although the authors refer to the use of social interaction theory in developing their model, the text does not discuss it. Another task that Mayer et al did not attempt was to extend their model to the organizational level of analysis. The authors refer to a hope that the model is suitable for extension at the organizational level of analysis. To date, this test has not been conducted. The goal of the subsequent chapters is the creation of an organization-level model with variables generated by the application of theory that is empirically tested.

Trust at the Organizational Level

The work discussed thus far has focused on the individual level of analysis. The remainder of the literature review will be dedicated to discussing work at higher levels of analysis. There is far less work on trust at these higher levels and this paucity of literature is one of the primary reasons for this study's focus on interorganizational trust.

One of the first references to trust at the group level of analysis can be found in Rotter's (1967) definition of trust. He defines trust as, "an expectancy held by an individual or a group that the word, promise, verbal or written statement of another individual or group can be relied upon." Rotter goes on to say that interpersonal trust and the ability of individuals to trust others is critical in a large number of psychometric concepts. The stated purpose of his article is to establish an instrument that measures interpersonal trust. As a part of the empirical process, subjects were placed into groups for analysis. Within these groups, subjects were asked to rank others in the group on scales for metrics such as popular, trustworthy, gullible, and friendly. Despite aggregating the answers of the respective groups, no inferences were made to group or organizational assessment of trust. The outcome of the instrument produced individual opinions about other individuals for the purposes of assessing the subjects' willingness to trust.

Despite making reference to groups and organizations in Rotter's definition of trust and despite his use of groups in measuring trust, it is clear that there is little to guide a theoretical or empirical discussion of trust. After defining trust with reference to groups or organizations, Rotter stays true to his stated goal and simply assesses interpersonal trust.

Rotter's work is typical of the trust literature in psychology. His work has been extensively cited in later studies. However, for a study of organizational level trust, interpretations that are more relevant are found in the sociological and organizational literatures.

Trust, as it is studied in the sociology and organization literatures, is different than the trust described in the psychology literature. The differences include, but are not limited to, definitional differences, levels of analysis differences, and antecedent and outcome differences. Some of these differences will be discussed here.

Sociological Perspectives of Trust

In the field of sociology, early references to trust can be traced to Parsons (1951) and Blau (1964). These scholars established a perspective that trust is an essential ingredient in interactions and in the maintenance of social relationships respectively. This kind of sentiment is seen regularly in the literature.

In another example, Gouldner's (1960) work on reciprocity is helpful as theoretical grist for understanding why an exchange may not have to be completely specified in a contract. Lack of contract specificity has often been cited in management journals as a positive sign reflecting the presence of a strong interorganizational relationship and of trust. This point, although it can be argued, helps establish the link between organizations, reciprocity and trust. In this case, Gouldner's (1960) representations of reciprocity are essential for the development of trust. Thus, in the forthcoming theory chapter, the link between reciprocity and trust is described in greater detail.

There are other concepts in the sociological literature that are worthy of consideration. For example, Bradach & Eccles (1989) help to establish an alternative to Williamson's (1975) markets v. hierarchy's argument. Without completely abandoning the notion of contracts, Bradach & Eccles (1989) show how trust between firms can be used to help minimize transaction costs. By describing a performance advantage that is available to firms willing to rely on trust, the authors open the door to more work demonstrating how two firms might use trust in a contractual relationship.

Shapiro (1987) offers a unique perspective on sociology and trust. Her characterization of trust makes heavy use of the theory of agency. The outcome of this unique combination helps establish the parameters under which trust can be both impersonal and institutionalized. As illustrated in Shapiro's (1987) work, agency theory's ability to deal with the conditions of risk and uncertainty make it a compelling theory to consider in describing the conditions under which a particular agent will be trusted. This feature of Shapiro's work will be discussed in greater detail in the following chapter.

Another piece established in the sociological trust literature draws upon the work of Zucker (1986) and Luhnmann (1979). These two authors independently note that institutions can act as a source of trust that is independent of the person-to-person interaction and trust development. This conception of trust provides an "outside the exchange" perspective that is important to consider when developing a comprehensive model of organizational trust.

The book by Fukayama (1996) offers a popular and accessible example of trust from a sociological perspective. The author suggests that societies can be divided into

two categories: high trust and low trust. He suggests that the high trust societies will enjoy greater prosperity and economic efficiency than low trust societies. While this work is compelling, this study's focus on organizational level activity with a single society context makes it difficult to develop Fukayama's (1996) ideas any further.

As noted earlier, the variables suggested in the sociological literature on trust tend to be macro-oriented variables (differences in national cultures, institutions as sources of trust, and norms of behavior). In this study, these variables will be considered in the construction of a theoretical model of organizational trust. However, these variables will *not* be addressed in any degree of specificity. This study's focus on a small niche of the health care industry within the United States takes these societal level variables out of the main spotlight. This is not to suggest that the variables are unimportant to the study of trust. Instead, it means that it is difficult to test them within the limited environmental scope of this study.

Organization Theory Perspective of Trust

In organizational studies, trust is examined as a desired commodity to create or conserve between firms[7]. This work, which does allude to some of the sociological work listed earlier, grew from work studying reciprocity (Gouldner, 1960), relationship formation (Van de Ven, 1976), interorganizational cooperation (Astley, 1984) and embeddedness (Granovetter, 1985).

Cummings and Bromiley (1996) offer an instrument to test inter-unit and interorganizational trust. Drawing from trust justifications established by Bradach & Eccles (1989), these authors do an admirable job of establishing categories for their

instrument that are based on their definition and theoretical understanding of trust. However, their analysis does not attempt to describe the ways in which trust can reside in organizational processes. Many of the measurement items are group-performance oriented; yet, the instrument is administered only to individuals. What is lacking is a theoretical justification for why an individual's opinion reflects the opinion of the organization. This is an especially troublesome void since there is no attempt to aggregate individual data. While the study purports to show inter-unit trust, there is no discussion indicating how the unit members' responses were aggregated.

Interorganizational trust also has been discussed and documented in work describing customer/supplier relations (Anderson & Narus, 1990; Anderson & Weitz, 1992; Doney & Cannon, 1997; Fichman & Goodman, 1996; Heide, 1994). This body of work notes the role of social-psychological variables in inter-firm activity. One of the social-psychological firm level variables included in their work is trust. The examples of organizational level trust activities provided earlier and the use of organizational trust in numerous theories and literatures suggests that organizations can be both a provider of trust and an object of trust.

Another branch of the organizational literature on trust is the work of Gulati (1995) and Li & Rowley (2000). Gulati (1995) notes the existence of inter-firm trust. He supports his use of inter-firm trust by referring to examples from the literature on relational contracting (Granovetter, 1985) and institutional theory (Zucker, 1986). Gulati (1995) quotes Zucker's (1986) work, describing trust as residing primarily within interpersonal relationships. However, Zucker adds that inter-firm trust is also possible.

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[7] Unlike some literatures, the within-firm trust studies make heavy use of psychology. Therefore they are

Both Gulati (1995) and Li & Rowley (2000) note the importance of partner selection in exchange relationships. Gulati (1995) suggests that prior ties are directly responsible for creating trust between contracting parties. This study advances the literature in this area by suggesting two things. First, it suggests that prior ties do not lead directly to trust. Rather, prior ties simply inform the two parties about each other. Second, this study helps articulate how the trust development process can function for organizations that have worked together, as well as for organizations that have had no interaction. By establishing the qualities that are important for partner selection, as this study does, we can examine these qualities in light of partners who have worked together and partners who have no prior interaction. Regardless, this literature helps establish the importance of prior ties to the selection of partners and to the strength of inter-partner trust.

Although only a few empirical studies of organizational level trust exist, an explanation of each is necessary. The Zaheer, McEvily & Perrone (1998) study of interorganizational trust asks a different question than this study. While they do consider where trust originates, the main focus of their paper is to determine the effect of interorganizational trust on conflict and negotiation costs. The one important antecedent oriented point they present is that individuals are critical in determining organization level trust. They prove their commitment to this perspective by using the aggregated responses of individuals to represent what they designate as interorganizational trust.

In the organization theory literature on trust, there is a greater opportunity to include appropriately identified variables. This is likely due to the fact that many of these

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appropriately analyzed with studies at the individual level of analysis.

variables more often occur at a lower level of analysis than the variables in the sociological literature. A previously mentioned variable that is being discussed with a great deal of regularity is prior ties. Originally, a variable that grew out of network exchange theory (Cook & Emerson, 1978), the prior ties variable has been getting considerable attention. Although originally popular because it could be easily included in the mathematical models of exchange theory, thanks to the work of Larson (1992), Gulati (1995), Cherry (2000), and Li & Rowley (2000), our understanding of the prior ties variable is much richer than it used to be. The basic premise of these studies is that trust is a significant outcome of working with other parties on a repeated basis. While this contention may lack extensive theoretical development, it is clear that the variable *prior ties* do have a connection to trust. This connection will be explored at greater length in the forthcoming chapter dealing with theory development.

While the prior ties component is helpful in situations when the two parties know each other before the exchange, the assumption that two parties will know each other is not always tenable. In those cases when the two parties have no personal knowledge of each other, they must rely on other factors to gain assurance in the other party. The phenomenon of trusting those you do not know has been discussed previously in the literature on trust. Meyerson, Weick & Kramer (1996) specifically discuss how reputations, or reputational capital, can serve in place of interpersonal history. Larson (1992) not only discusses prior ties but also discusses reputation. She articulates the role of both reputation and prior relations as conditions to exchange. Like prior ties, the specific role of reputation will be discussed in greater detail in the subsequent chapter.

Conclusion

The intent of this chapter is to establish the topics that have been covered on trust. Specifically, it describes the work on interpersonal and interorganizational trust. What is clear from this discussion is that despite considerable effort to understand trust, interorganizational trust remains a relatively understudied concept.

Table 1 – Commonly Used Definitions of Trust

1) "Interpersonal trust is defined here as an expectancy held by an individual or a group that the word, promise, verbal or written statement of another individual or group can be relied upon."
-Rotter, 1967

2) "...trust (or symmetrically, distrust) is a particular level of the subjective probability with which an agent assesses that another agent or group of agents will perform a particular action, *both* before he can monitor such action (or independently of his capacity ever to be able to monitor it) *and* in a context in which it affects his own action."
-Gambetta, 1988

3) "Trust will be defined as an individual's belief or a common belief among a group of individuals that another individual or group (a) makes good-faith efforts to behave in accordance with any commitments both explicit or implicit, (b) is honest in whatever negotiations preceded such commitments and (c) does not take excessive advantage of another even when the opportunity is available."
-Cummings & Bromiley, 1996:

4) "Trust is the reliance by one person, group, or firm upon a voluntarily accepted duty on the part of another person, group, or firm to recognize and protect the rights and interests of all others engaged in a joint endeavor or economic exchange."
-Hosmer, 1995

5) "The willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party." (The authors note that this definition is similar to Gambetta's 1988 definition, with the addition of vulnerability.)
-Mayer, Davis & Schoorman, 1995

6) "in contracting behavior terms, trust reflects "the extent to which negotiations are fair and commitments are upheld" (Anderson & Narus, 1990) and one party's belief that its requirements will be fulfilled through future actions undertaken by the other party (Anderson & Weitz, 1989)."
- Zaheer & Venkatraman, 1995

7) "...trust is the expectation that the promise of another can be relied on and that, in unforeseen circumstances, the other will act in a spirit of cooperation with the trustor"
- Hagen & Choe, 1998

Table 2 – Trust's Antecedents

Antecedents	Authors
Ability	(Butler, 1991; Cook & Wall, 1980; Deutsch, 1960b; Good, 1988; Jones, James, & Bruni, 1975; Mayer et al., 1995; Sitkin & Roth, 1993)
Altruism	(Frost, Stimpson, & Maughan, 1978)
Autonomy	(Hart, Capps, Cangemi, & Caillouet, 1986)
Availability	(Butler, 1991)
Benevolence	(Larzelere et al., 1980; Mayer et al., 1995; Solomon, 1960; Stickland, 1958)
Caring	(Mishra, 1996)
Competence	(Butler, 1991; Kee & Knox, 1970; Lieberman, 1981; Mishra, 1996; Rosen & Jerdee, 1977)
Consistency	(Butler, 1991)
Credibility (of person, promise or punishment)	(Dasgupta, 1988; Good, 1988)
Dependence/Interdependence	(Frost et al., 1978)
Discreteness	(Butler, 1991)
Dynamic	(Giffin, 1967)
Experimentation w/ new behavior, behavior relevancy	(Farris, Senner, & Butterfield, 1973; Jones et al., 1975)
Expertise	(Giffin, 1967; Hovland, Janis, & Kelley, 1953)
Fairness	(Butler, 1991)
Goodwill	(Ring et al., 1992)
Group goals	(Rosen et al., 1977)
Honesty	(Larzelere et al., 1980)
Integrity	(Butler, 1991; Lieberman, 1981; Mayer et al., 1995; Ring et al., 1992)
Intentions, motives	(Cook et al., 1980; Giffin, 1967; Good, 1988; Hovland et al., 1953; Kee et al., 1970)
Loyalty	(Butler, 1991)
Norms	(Farris et al., 1973)
Openness, good communication	(Butler, 1991; Farris et al., 1973; Gabarro, 1978; Hart et al., 1986; Mishra, 1996)

Table 2 - Continued

Ownership of feelings	(Farris et al., 1973)
Past Interaction, repeat ties	(Boyle & Bonacich, 1970; Gabarro, 1978; Gulati, 1995; Li et al., 2000)
Predisposition / Propensity	(Boyle et al., 1970; Mayer et al., 1995)
Promise fulfillment	(Butler, 1991)
Receptivity	(Butler, 1991)
Reliable	(Giffin, 1967; Johnson-George et al., 1982; Mishra, 1996)
Reputation	(Giffin, 1967)
Risk	(Shapiro, 1987)
Shared values	(Hart et al., 1986; Sitkin et al., 1993)

Table 3 – Definitional Components

Author(s)	Actors/Level of Analysis	Operant State	Actions of Trustor	Actions of Trustee	Context of Actions
Rotter, 1967	Individual to individual Group to group	An expectancy	Relies on word, promise or statement	Offer promise or statement (no follow-up action)	None stated
Gambetta, 1988	Agent to agent Agent to group of agents	An assessment of probability	None stated	Performs a particular action affecting trustor agent	Monitoring may be unavailable
Cummings & Bromiley, 1996	Individual to individual Group to group	A belief	None stated	Good faith effort to behave as promised Is honest Does not take advantage	Opportunities may arise for self-interest
Hosmer, 1995	Person to person Group to group Firm to firm	A reliance	None stated	Voluntarily accepts duty to recognize and protect rights of other	Joint endeavor
Mayer, Davis & Schoorman, 1995	Party to party	A willingness	Allows for own vulnerability	Engages in particular actions important to trustor	Ability to monitoring or control may be unavailable
Zaheer & Venkatraman, 1995	Party to party	A state of fairness in activities A belief	Establishes requirements	Fulfills requirements with future action	None stated
Hagen & Choe, 1998	Trustor and another	An expectation	Relies on promise	Upholds commitments and acts in spirit of cooperation	Unforeseen circumstances may occur

CHAPTER 3 - THEORY & HYPOTHESES

This chapter develops the theoretical model of the study. While the model is unique to the study of trust, it draws heavily from the extant literature on trust. The model also draws heavily from work on social exchange and agency theories. The purpose of the model is to predict and explain how trust can exist at the organizational level and to describe what predicts it.

Interorganizational trust is a multi-dimensional construct generated in a series of iterative steps. These steps and the relevant variables at each step are sorted into a *past, present* and *future* framework. In the first stage (*past*), two sources provide needed information to the trustor about the trustee. These variables are *reputation* and *prior ties.* The next step in the process *(present)* contains a set of trustworthiness assessments based upon certain antecedents. The trustor evaluates the trustee on the basis of trustworthiness antecedents that include *competence, efficacy, benevolence orientation, values compatibility* and *values consistency.* At the final stage *(future)*, the dependent variable *interorganizational trust* is presented as a behavioral orientation towards the future.

This study is not a comprehensive examination of the trust building process. However, the inclusion of the variables reputation and prior ties as sources which inform trustors about the *competence, efficacy, benevolence orientation, values compatibility* and *values consistency* of the trustee provides a development argument that is new to the study of trust. Although there are important institutional level factors that affect organizational trust, they are not discussed here as they are outside the scope of this study.

After selecting a definition of trust from the existing literature, the prediction of and rationale for the aforementioned three-phase trust process and the variables in each phase is presented via a synthesis of social exchange theory and agency theory. A model

showing the antecedents and their relationship to interorganizational trust, and based on the theoretical explication, is presented. Finally, each variable is described in detail and its relationship to interorganizational trust is supported and presented as a hypothesis.

Definition of Trust

As previously noted in Chapter 2 - Literature Review and presented in Table 3, only two of the extant definitions of trust contain attributes in the five relevant categories. These definitions come from Mayer et al (1995) and Hagen & Choe (1998). These definitions have similar qualities in all the criteria categories except for the category labeled *Actions of the Trustor.* Whereas Hagen & Choe (1998) describe the actions of the trustor as *relying on a promise,* Mayer et al (1995) describe the actions of the trustor as *allowing for own vulnerability.* The difference between these two characterizations of trustor action is clearer when considering the implication of each characterization. Hagen & Choe's description of the trustor's actions is direct and hides little additional meaning. Their definition suggests that the trustor relies on a promise. The Mayer et al description of the trustor's action is specific about what the trustor does and allows for his/her own vulnerability. However, it also implies that the trustor is exposed to some degree of risk in the exchange. The notion of risk in this definition helps establish that the trustor must have something of value that he/she is placing in jeopardy. Without something of value being held in the balance, there is no risk and the trustor is not making herself vulnerable.

The distinction is important and can be traced to the earliest work on trust. Deutsch (1958) suggests that there is little need for trust without something at risk. Since vulnerability is a well-recognized component of a trusting relationship, it is preferable if it is addressed in the definition of trust.

The definition by Mayer et al (1995) speaks to each of the aforementioned criteria of trust. Their definition of trust allows for a multilevel examination of trust[8], it describes the operant state of the trustor, it describes the appropriate actions of the trustor, it describes the expected actions of the trustee and it suggests the context within which the exchange between the trustor and trustee is to occur. While one other definition of trust also addresses these five criteria, Mayer et al's (1995) definition contains an important reference to risk that is not contained in the other definition. Because it addresses all of the relevant criteria and also addresses the risk that is inherent in any trusting relationship, Mayer et al's (1995) definition is more useful for this study.

Thus, this study utilizes Mayer et al's (1995) definition of trust that says trust is,

> "...the willingness of a party to be vulnerable to the actions of another party based on the expectations that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party. (p.712)"

The relational aspects of trust, and the earlier references to exchange and agency theories will be discussed in greater detail in the forthcoming section.

Contending Theories

Social Interdependence

Work on trust can be grounded in a number of theories. One theoretical tradition that deals with trust is *social interdependence theory.* Originally articulated in the work of Lewin in the 1920s and 1930s, Deutsch (1958; 1960a; 1960b) was the first to explicitly describe the relationship between social interdependence and trust. While this is an

[8] In a personal correspondence, Roger Mayer (2001) suggested that his co-authored article on trust was originally conceived as a multilevel theory of trust. However, the article was modified to omit reference to

excellent theoretical background for some work on trust, it is not the best choice for this study. As noted in the literature review, much of Deutsch's work deals with the psychological state of a particular individual. Deutsch represents this psychological state as a predisposition to trust others or to avoid trusting others. The inter-organizational context of this study requires a broader theory than one in which the primary focus is the psychological state of an individual. Thus, social interdependence theory is not ideal for this project.

Social Identity

Yet another theory to consider for work on trust is the *social identity theory*. This theory that has its roots in social psychology, posits that individuals derive value from the feeling of belonging to a group (Tajfel, 1982; Turner, 1987). Part of the process of identifying with a group is the development of an in-group and out-group mentality. Members of the in-group will enjoy preferential treatment from other members of the in-group. The relationship between this theory and trust among interorganizational exchange partners is the implication that because both parties might be members of a common in-group, they would be more likely to trust each other.

The difficulty in using social identity theory for this study is twofold. First, there is conflicting evidence of the role of social identity in predicting whether relations will occur more readily or will be governed more easily. Notably, scholars have found that individuals with similar characteristics may exhibit lower initial levels of trust (Ammeter, 2000). Another study that examined interorganizational activity found that high trust relationships often yielded higher levels of internal conflict (Li et al., 2000). These

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higher levels of analysis at the request of a reviewer. This study's definition of trust come from Mayer's work.

findings suggest that although social identity theory is important in defining in-group and out-group status, it is not the best theory to explain certain aspects of interorganizational trust. However, because social identity provides the ability to speak to issues such as partner selection in the exchange process, aspects of social identity theory will be utilized in justifying two of the antecedents of trust.

Social Exchange

A more relevant theoretical tradition for this study's examination of trust is *exchange theory.* Although the nature of exchange has been discussed for a long time (Aristotle, 1985; Smith, 1761), it was not until sociologists like Homans (1961) and Blau (1964; 1974) embraced the subject that it came to be recognized as a stand-alone theory. An example of social exchange theory applied to trust is seen in the work of Whitener et al (1998).

Homans' Approach

Homans conceived of exchange theory as the exchange of tangible and intangible things between two or more individuals. Despite being recognized as someone who studied issues at the collective and societal level, he saw the phenomenon of exchange as being individualistic and rooted primarily on psychological motivations (Homans, 1961). Ritzer (2000) summarizes Homans' basic propositions regarding exchange theory. These basic propositions provide a compelling look at a basis for motivation; however, they will not be used for this study. Homans' propositions are overly individualistic for this study. The work of later scholars refines Homans' propositions in a manner that makes them more accessible.

Blau's Approach

This study adopts a conceptualization of social exchange theory that is largely drawn from the work of Peter Blau (1964; 1974). However, before discussing the points that are drawn from his work it is necessary to explain the differences between his work and that of Homans. It is also necessary to illuminate points where this study's conceptualization of social exchange theory is likely to differ from Blau's.

After studying with Homans, Blau (1964; 1974) sought to develop social exchange theory in a different direction. Whereas Homans had placed an individualistic stamp on social exchange theory, Blau sought to direct it in a way that would make it more applicable to complex social structures (Emerson, 1976; Ritzer, 2000). Accordingly, Blau was concerned with mechanisms that provided a micro level to macro level transition and with mechanisms that created social structures. These elements of exchange theory will be discussed shortly.

Blau's work (1964) makes a distinction between *economic and social exchange.* This study's aim is to understand the trust between two organizational entities involved in an exchange. On first glance, this type of exchange appears to be a situation that Blau deems as an *economic exchange.* Blau (1974) contends that since goods are exchanged under the governance of a contract specifying responsibilities and timing, the exchange should be defined as economic. Although it is not applicable to this study, Blau also considers situations in which there is a spot contract (the immediate transfer of goods) as another defining aspect of an economic exchange.

In Blau's eyes, determining whether the exchange is *social* or *economic* is important for this study as he suggests that trust is only required in *social exchanges* (Blau, 1974). He suggests that the immediacy of exchange and presence of a contract in

economic exchange, obviate the need for trust. Based on Blau's description of economic exchange, it is conceivable to presume that he might consider the setting of this study unsuitable to social exchange theory. While this study agrees that there is a difference between the two types of exchange, we see these as differences of degree rather than of type. We contend that *social* and *economic exchange* represent two ends of a continuum rather than different categories of exchange. As such, this study's conceptualization of exchange is an *economic* one occurring within a *social* context.

Social exchange is an appropriate theory for two reasons. First, economic exchange has come to be recognized as having many social aspects. Recent work recognizes the inherently social nature of economic exchange. Ouchi's (1980) work on clan governance and Granovetter's (1985) work on embeddedness has helped to create an entire body of literature on social contracting. Although some aspects of an economic relationship are formed by contractual conditions such as specific deliverables, deadlines, and payment terms, contracts are rarely fully specified. Further, spot contracts are not a governance structure that is common to interorganizational relationships.

Business exchanges that are not spot contracts and cannot be fully contracted are precisely the types of contracts that organizations create and are owed diffuse obligations. It is clear that obligations exist, but the specifics of the obligation and the timing of the obligation may be open to debate. The obligation is not well defined, nor is the timing of the obligation well articulated. In these diffuse obligations, one party must trust that the other party will behave appropriately by conveying a benefit for a benefit that was received earlier. In such circumstances, the party owed the obligation must **trust** the party that owes the obligation. The occurrence of unforeseen events places the exchange partners in a territory that is unregulated by the contract.

The second objection Blau might offer to the use of social exchange theory for this study is that at the time Blau and Homans were working on developing social exchange as a theory, it was applied exclusively to environments in which the medium of exchange did not involve money (Blau, 1974). Early social exchange scholars suggested that the use of money as a medium of exchange obviated the need for social influence and norms in order to gain the reciprocity of others. Thus, exchanges involving money were seen as purely *economic*. However, the use of money as a basis of *social* exchange has since been established in the work of La Valle (1994). Thus, for a study such as the one suggested here in which one party would complete the exchange with a monetary payment does not prevent the use of social exchange theory as an appropriate tool for examining the relationship.

Later work by Emerson (1972a; 1972b; 1976) and Cook and Emerson (1978) attempts to remedy what they observe as flaws in Blau's characterization of exchange theory. The concerns of these scholars related to their perception of problems with the role of rationality, tautological concerns and concerns about psychological reductionism. Their attempts to address these perceived flaws took traditional exchange theory and modified it into a new theory, often referred to as network exchange. In this new theory, greater emphasis is placed on the network of actors and the power differentials between members of the network.

Tenets of Social Exchange Theory

With the previously presented brief history of social exchange theory in mind, this study will focus on a particular set of tenets from the theory. These tenets are drawn from the work of Blau (1964; 1974). Although there is more recent work on exchange theory (Cook et al., 1978; Emerson, 1972a, 1972b, 1976) that suggests problems with Blau's

work, this new work in network exchange theory is less applicable due to its focus on networks instead of on dyads and its preoccupation with power. This study is more interested in dyadic relationships that emphasize trust rather than power as the prime feature of relationship governance. This study's attention to more traditional notions of exchange is mirrored in other recent work. Pieces by recent scholars such as LaValle (1994), Whitener et al (1998) utilize social exchange and not network exchange as their operative theories.

Because of the concise and generally applicable way that Blau characterizes exchange theory, this study uses his tenets of exchange as a theoretical basis for understanding the antecedents of interorganizational trust. The flaws noted by Emerson and Cook, while valid, are of greater concern if one is attempting to construct theories that predict higher level sociological phenomenon. For understanding dyadic, organizational relationships, Blau's work is ideal.

A) Reward Sought

According to Blau (1964; 1974) the first tenet of exchange theory is that ***A)*** people enter into, and maintain exchange relationships because there is a reward involved. This reward can be intrinsic or extrinsic; thus, this first assumption of exchange theory goes beyond being a purely rational motive aimed at tangible gains. This is an important point for the study of trust; and previous work on trust has been criticized for failing to recognize that proper levels of trust are really nothing more than rational calculation, and trust that goes beyond rational calculation is simply foolhardiness (Williamson, 1996).

B) Attractive Partner Sought

Another tenet of exchange theory is that ***B)*** to be selected by an exchange partner, one must present oneself as a potentially attractive associate. Although a definition of a potentially attractive associate is not provided, applying a standard consistent with tenet ***A)*** suggests that an attractive potential associate is one who has the ability to provide the rewards for which her exchange partner is looking.

C) Assumes Reciprocity in Exchanges

Another tenet of exchange theory is that ***C)*** since both sides of the exchange relationship are expected to provide the other side with rewards, there is an assumption of reciprocity. The receipt of rewards by one party does not end the exchange relationship as there is an obligation by the party receiving the rewards to reciprocate. This tenet speaks directly to trust as the conveyance of rewards to the two parties in an exchange relationship. In many settings simultaneous conveyance of rewards is rare. Once Party A receives its rewards, Party B trusts that Party A will fulfill its commitment to help Party B receive its rewards.

D) Completed Exchange Fortifies the Social Bond

Yet another tenet in exchange theory is ***D)*** that completed exchanges, ones in which both sides received the anticipated rewards, fortify the social bond between the two parties. The belief in exchange theory is that the relationship grows over time and strengthens with every successful exchange. While exchange theory does not directly address the strength of the relationship or level of trust between two parties who have never engaged in a transaction, the application of tenet ***A)*** would imply that the value of the potential rewards to be gained from engaging in a new exchange relationship are significant enough to overcome any lack of experience with the exchange partner. The

exchange partners are either willing to overlook their lack of knowledge about each other, or they will seek alternative means of mitigating the risk of a new exchange relationship.

The foundation of social exchange theory for this discussion of trust is that social exchange relationships are more likely to create a diffuse set of future obligations rather than specific ones. Recalling this study's definition of trust, it is evident that a partner has a responsibility to protect your interests. This description is more general and allows for diffuse obligations that are common in today's business relationships. It is rare that we can satisfy all that a relationship requires of us simply by meeting a highly detailed set of obligations. Consequently, there will be diffuse obligations owed the exchange partner in many economic transactions. When diffuse obligations exist, trust is a necessary ingredient in the relationship.

Model of Organizational Trust

On the basis of the previously established tenets of exchange theory and the extant literature on trust, it is possible to create an organization-level theory of trust. The theory is reflected in a casual map that is presented here as Figure 1.

PAST - Preconditions to the Antecedent of Trust: Information from the Past

Prior Ties

Before discussing the antecedents of interorganizational trust it is helpful to know the source of the trustor's information regarding the trustee. All of the antecedents that will be discussed shortly, are potential qualities possessed by the trustee. This begs the question, how does the trustee come to know the qualities of the trustee? This study suggests that there are two sources of information about trustees: prior ties and reputation.

These two factors are mentioned in the literature on trust and their role in interorganizational trust needs to be clarified.

Tenet ***D)*** of social exchange theory suggests that completed exchanges fortify the exchange relationship. In essence, it establishes the importance of prior ties as a variable in the interorganizational trust model. Further, its focus on *completed* exchanges suggests an interest in *past* events. This focus on the past is important to the trustee assessment process.

When a trustor begins the process of assessing a potential trustee, they can draw from their previous interactions with the trustee (prior ties). However, if the trustor has not experience prior interactions with the potential trustee, the trustor must draw from external sources of information regarding the trustee (reputation). External sources of information provide a picture of the trustee's reputation and how this reputation speaks to trustworthiness factors that help the trustor generate feelings of trust in the trustee.

This characterization of prior ties differs slightly from other literature on trust. For example, in Gulati's (1995) research on organizational level trust, he suggests that familiarity with an exchange partner creates trust with that exchange partner. He refers to work by Shapiro et al (1992) when he states,

> "The idea of trust emerging from prior contact is based on the premise that through ongoing interaction, firms learn about each other and develop trust around norms of equity or "knowledge-based trust" (Gulati, 1995 p.92)."

Gulati also uses this premise to suggest that trust between firms in an alliance will alter the contract governing that alliance. As such, his work is not an empirical test of whether trust is created by prior alliances. Rather, it is a test of whether a proxy for trust (prior alliances) can predict alliance governance structures. He suggests that testing trust is

difficult and supports the use of prior ties as a proxy by referring to empirical studies that examine cooperative relations (Larson, 1992; Parkhe, 1993). The preference for using previous alliance partners was reaffirmed by Li and Rowley (2000), who noted the importance of reciprocity in past ties as a predictor of future partner selection.

The importance of prior ties to considerations of trust noted in these papers is supported by our earlier discussion of exchange theory. Tenets ***C)*** and ***D)*** both predict the role of prior ties as being important to the study of trust. Tenet ***C)***'s focus on the reciprocity of exchange is specifically studied in Li & Rowley (2000). Tenet ***D)***'s focus on the fortification of social bonds is specifically studied in Larson (1992), Parkhe (1993), and Gulati (1995). Thus, there is theoretical and empirical justification to study the prior ties of the two firms.

However, this study takes a different approach regarding the role of prior ties. While we agree that prior ties lead to trust, we suggest that prior ties do not create trust directly. Rather, prior interactions serve to inform the two parties about the qualities that create trust: ability, benevolence and integrity. For example, Ford's interaction with Firestone serves to inform Ford's opinion of Firestone in that Ford knows more about Firestone's ability to make a tire. In this case, Ford would suggest that Firestone is not capable of producing a consistently high quality tire for Ford's Explorer.

The theoretical support for this contention comes from tenet ***D)*** of social exchange theory. This tenet suggests that completed exchanges fortify the social bonds of the exchanging parties. In terms of two firms interacting, the fortification of the bond occurs because the trustee firm has better information about the trustor firm. Good performance on an interorganizational exchange improves the trustor's assessed level of the trustee's ability, benevolence and integrity.

While prior ties inform the trustor about the trustee's ability, benevolence and integrity, it is only those prior interactions that are deemed successful that create greater perceived levels of the trustworthiness factors. To the extent that the prior ties were successful, then the trustee has improved their perceived trustworthiness as measured by their ability, benevolence and integrity.

H1a: Prior successful ties between the trustor and the trustee are positively related to the trustor's assessment of the trustee's competence

H1b: Prior successful ties between the trustor and the trustee are positively related to the trustor's assessment of the trustee's efficacy

H1c: Prior successful ties between the trustor and the trustee are positively related to the trustor's assessment of the trustee's orientation

H1d: Prior successful ties between the trustor and the trustee are positively related to the trustor's assessment of the trustee's values consistency

H1e: Prior successful ties between the trustor and the trustee are positively related to the trustor's assessment of the trustee's values similarity

Reputation

The scenario dealing with prior ties listed above assumes that a trustor has worked with a trustee and has developed a knowledge-based assessment of trust. However, if the trustor had not had the opportunity to work with the trustee there is a substitute that can act in the place of prior ties. The trustor can gather information from external sources about the trustee's reputation.

Like prior ties, reputation was identified in the literature review as an important variable in the study of trust. Using the work of DiMaggio & Powell (1983), Fombrun &

Shanley , and Waddock (2002) this study uses its own definition of reputation. We suggest that reputation is the collective held and publicly available judgment about an organization's ability to the firm's activities, achievements and prospects. Although some authors confuse prior ties and reputation by suggesting that reputation is similar to prior performance. This conceptualization makes it easy to confuse reputation and prior ties. Larson (1992) specifically notes the fact that reputation, as a source of information about an organization, can be substituted for a lack of prior ties to that organization. This characterization of prior ties and reputation establishes them as separate and distinct constructs. This study adopts Larson's characterization of these two constructs by suggesting that firms can gather information about another firm's ability, benevolence and integrity through working with a firm or by researching the firm's reputation. If a trustor firm has worked with the trustee firm previously, then there is little need to identify the trustee's abilities, benevolence and integrity. The trustor already possesses information on these three variables. If however, the trustor has never worked with the trustee, then the trustor will identify the reputation of the trustee. While we grant that reputation includes some of the trustee's prior work, we contend that this is limited to other firms and not to the trustor. Thus, work with others is included in reputation, while work with us is a prior tie.

For example, after the serving of ties between Ford and Firestone, Ford needed to secure new sources of tires for its Explorer as well as other models. Since the production capabilities of Ford's existing tire vendors are limited, it is likely that Ford will have to work with a tire company with which they have no prior ties. Assume that Ford contacts Continental, a German tire manufacturer. Given the lack of prior ties with Continental, Ford's source of information about Continental's abilities, benevolence and integrity will

come from Continental's reputation. Ford will likely discover that Continental has been one of the main suppliers of tires on high performance European sedans and on large trucks. This combination of abilities may be just the first of Ford's reasons to start trusting Continental.

No specific tenet exists to support the inclusion of reputation in this model of interorganizational trust. However, its inclusion is necessary because most of the models of trust assume that the two parties know each other. While this may seem like a necessary condition to have trust, scholars have documented trust between complete strangers and people who have recently met (Berg, Dickhaut, & McCabe, 1995; Kramer, 1994; McKnight, Cummings, & Chervany, 1998). Thus, reputation is included in this study to accommodate those firms that have never worked together.

A reputation is a general impression that covers many of an organization's attributes. These general impressions can be drawn from archival sources like trade publications and magazines, or from informed members of trustor's network like other firms that have worked with the trustee. Like the role that prior ties plays, the presence of a good reputation is positively associated with the trustworthiness factors or ability, benevolence and integrity.

H2a: A trustee's good reputation is positively related to the trustor's assessment of the trustee's competence

H2b: A trustee's good reputation is positively related to the trustor's assessment of the trustee' efficacy

H2c: A trustee's good reputation is positively related to the trustor's assessment of the trustee's orientation

H2d: A trustee's good reputation is positively related to the trustor's assessment of the trustee's values consistency

H2e: A trustee's good reputation is positively related to the trustor's assessment of the trustee's values similarity

PRESENT – Assessing the Antecedents of Interorganizational Trust

Before discussing the specific antecedent of interorganizational trust, it is important to discuss some important levels of analysis concerns. As stated earlier, the focus of this study is to understand and explicate the antecedents of organization level trust. Since the organizational focus of this study is far less common than examining this question as an individual phenomenon, there is less work to draw from. Although the antecedents of organizational trust that will be presented shortly are derived from theory, they are common to the literature on individual level trust. In order to address why variables are common to both levels of analysis the following section discusses the relationship between the two levels of analysis and provides support from numerous scholars.

The Relationship between Individual & Organizational Levels of Analysis

Interpersonal trust has been extensively studied and has been shown to be critical to our understanding of organizational trust (Ring et al., 1992; Ring & Van de Ven, 1994; Zaheer et al., 1998). Organizations are comprised of individuals, and there is a documented connection between individual action and the actions of the organization. However, the actions of individuals are not always the actions of the firms they represent. In some cases it is inaccurate to sum the acts of the individuals within an organization and assume that this summation is an accurate reflection of the organization's acts. Conversely, it is inappropriate to anthropomorphize the firm by suggesting that it is capable of behaviors exclusive to human actors (Rousseau, 1985).

Ring & Van de Ven (1992) and Zaheer, McEvily & Perrone (1998) utilize role theory and boundary spanners to talk about the significance of individual actors in the creation of organizational trust. Introduced by Katz & Kahn (1978), the notion of boundary spanners is critical to this study because the boundary spanners referred to by these authors are the subjects used in the testing of this model.

Zaheer, McEvily and Perrone (Zaheer et al., 1998) use boundary spanner concepts to explain how trust can be aggregated to constitute an organizational concept. They suggest that individuals who serve as the primary contact between firms are critical to the trust formation process. They contend that it is,

> "individuals as members of organizations, rather than the organizations themselves, who trust (Zaheer et al., 1998 p.141)."

These authors suggest that in the right circumstances, individuals acting in the roles for the organization are responsible for creating interorganizational trust. Zaheer et al use this perspective to support their use of aggregated individual responses to measure trust at the organizational level. This perspective of individual and organizational level phenomena is reaffirmed in the work by Nelson & Winter (1982) who note that organizational learning closely follows the processes and patterns of individual learning.

Building on this stream of work, this study suggests that given the human interaction required in developing interorganizational trust and the relatively small group sizes of the organizations that will be tested, it is wholly consistent to conclude that interorganizational trust and interpersonal trust share common developments and common antecedents.

The Antecedents of Interorganizational Trust – Assessments in the Present

Mayer, Davis & Schoorman (1995), Mayer & Davis (1999b) and Davis, Schoorman, Mayer & Tan (2000) provide a systematically laid out and empirically tested theory of how interpersonal trust can be predicted. In a response to critiques (Schoorman, Mayer, & Davis, 1996) and in personal communication with one of the authors (Mayer, 2001), it was clear that the authors wished to produce a model that would suffice in organizational applications. They stated that,

> "The importance of workgroups trusting each other and organizations that are in supplier-customer relationships developing a level of trust cannot be overstated. In the development of our model of dyadic trust, we were very conscious of this needed extension and attempted to develop a model that would form the basis for such extensions (Schoorman et al., 1996 p.340)."

The basic variables that these authors use to predict trust between two people (a trustor and a trustee) are *ability*, *integrity* and *benevolence*. Mayer et al (1995) suggested that these variables represent factors of trustworthiness in a potential other. These variables were developed after studying a list of trust antecedents culled from the literature. Duplicate antecedents and antecedents that overlapped were eliminated from the list. The list was further simplified by carefully considering the remaining antecedents in light of the authors' chosen definition of trust. While these three variables work well as individual level constructs, this study generates its own list of variables through the application of social exchange theory and agency theory. Although they are similar to the antecedents developed by Mayer et al (1995) the process for arriving at them differs as does the level of analysis at which they operate. The process for arriving at these variables follows.

Tenet **B** of social exchange theory suggests the importance of identifying and exchanging with attractive partners. However, it is not clear from social exchange theory or other theories common to the trust literature which factors are important in identifying an attractive partner. Podolny (1990) refers to this lack of identification by suggesting that the type and number of partners available is not well defined. We contend that the factors that make a partner attractive are trustworthiness factors that lead to trust.

The problem of identifying an attractive exchange partner is not altogether different from the problem facing a principal in search of a good agent. The trustor is similar to the principal in that they have chosen to have someone else perform a task for them. This choice involves putting oneself in a position of vulnerability as there is something at risk. The notion of vulnerability and risk a featured in agency literature (Mitnick, 1973) and in the work on trust (Zaheer et al., 1998). A proper trustee (agent) is sought to help mitigate some of this risk associated with the exchange. Thus, this study utilizes agency theory to help identifies elements that make an exchange partner attractive.

Although agency may seem to be an odd choice for the role of identifying a trustworthy exchange partner, there is a branch of agency that makes it the perfect choice. Further, there is a precedent in the literature on social exchange for integrating agency theory. This unique integration can be seen in the literature on leader/member exchange by such authors as Wayne, Shore & Liden (1997) and Whitener, Brodt, Korsgard & Werner (1998).

The theory of agency, as jointly developed in separate efforts by Ross (1973) and Mitnick (1973) can be broadly separated into two categories[9]. The first category includes what Mitnick has referred to as the financial economics literature on agency (Mitnick, 1994). This literature includes some of the more commonly recognized work on agency such as Jensen & Meckling (1976), Fama (1980), Fama and Jensen, (1983), and Pratt & Zeckhauser (1985).

Mitnick (1994) refers to the other category of agency literature as sociological/organizational and it is more relevant to this study's characterization of trust in organizational settings. This stream of the literature is not as well known but includes the work of scholars like Mitnick (1975; 1980; 1992; 1993), White (1985), Leblebici & Fiegenbaum (1986) and Shapiro (1987). Mitnick refers to the potential uses of this category of agency literature by saying that with proper attention,

> "the agency approach may both retain its special attractiveness as a theoretical vehicle for understanding certain features of organizations such as control failures as well as extend its utility to become a truly general contender in our efforts to develop general theory of organizations (1994 p.6)."

The sociological/organizational stream of agency literature is helpful for identifying attractive exchange partners, which is *Tenet B* from social exchange theory. This stream of agency literatures provides answers because if identifies and helps address two significant problems in agency relationships: adverse selection and moral hazard. As previously noted, *Tenet B* advocates identifying attractive exchange partners. The process of identifying an attractive partner incorporates both of the aforementioned agency problems.

[9] For a different categorical breakdown of the agency literature, see the work of Eisenhardt (1989).

In the language of agency, adverse selection occurs when a principal overestimates the qualities of the agent. The agent may misrepresent their abilities, or the principal may mistakenly assume that the agent possess certain skills. Regardless of the source, the outcome is the same. A situation involving adverse selection means that the agent will be unable to perform the assigned task because they lack the necessary skills.

The other agency problem is moral hazard. This problem concerns intent and motivation more than adverse selection does. Moral hazard occurs when an agent shirks responsibility. The agent may possess the necessary skills to perform the task, but because of other concerns does not. Although there may be many causes for this behavior, the primary one is thought to be the lack of shared goals between the principal and agent.

These two concepts, moral hazard and adverse selection help frame the task of the trustor who is seeking an attractive trustee to complete and exchange. A further advantage of this framework is that it is applicable to the individual level of analysis and the organizational level of analysis (Eisenhardt, 1989; Mitnick, 1994). Thus, this study uses agency concepts to help explain interorganizational trust.

The basic need for agency is a good place to start in developing a set of variables to identify an attractive exchange partner. Agency, or the need to have others act on your behalf, occurs because the trustor either lacks necessary skills or because the trustee is more efficient in the execution of these skills[10]. From this basic claim, two factors of trustee trustworthiness are evident and both relate to adverse selection.

[10] For this study's analysis, the terms trustor and trustee are synonymous with the terms principal and agent, respectively.

Competence

First, the trustee must have the skills necessary to complete the task. Notice that this does not imply a general level of competence. Rather, it implies a competence to do a specific task or set of tasks. For example, at one time Ford trusted Firestone to make original equipment tires for its vehicles. Ford sought Firestone's competence in making tires and offering advice on tire applications and performance. This basis of this trust did not extend to areas outside Firestone competencies. Thus, Firestone was not a likely source of counsel for Ford's desires to reduce the number of automotive platforms that it used.

Holding all things equal, competence in a particular skill set relevant to the needs of the trustor will generate trust between the trustor and the trustee.

H3: The trustor firm's assessment of the competence of a trustee firm will be positively related to trust in the trustee firm

Efficacy

The second trustworthiness factor suggested by the aforementioned claim of agency relates to efficacy. The trustee is expected to be efficient in the completion of the tasks the trustor requires of it. If for example Firestone was very good at making tires, but lacked an ability to make them efficiently, then Ford's level of trust in Firestone would not be enhanced. If however Firestone can make the tire well and make it efficiently, then Ford will trust Firestone more than if either of these variable is missing. Holding all things equal, the efficiency demonstrated by the trustee will enhance the trust that the trustor places in the trustee.

H4: The trustor firm's assessment of the efficacy of a trustee firm will be positively related to trust in the trustee firm

These variables although derived from agency theory, have roots in the existing literature on trust. In the work of Mayer et al (1995), they note that one of the trustworthiness factors that creates trust between an individual trustor and individual trustee is ability. Their definition of ability as,

> "...that group of skills, competencies, and characteristics that enable a party to have influence within some specific domain (Mayer et al., 1995 p.717)..."

can easily incorporate the constructs generated in this study through the application of agency theory and social exchange theory. Mayer et al specifically notes ability's application to individuals. In this study, ability applies to organizations. Given the extensive literature on organizational capabilities and resources, viewing firms as possessing abilities is not inconsistent with prior work. This conceptualization leads to the first two features that make a trustee attractive and trusted by the trustor. If the trustor can not perform the task because he/she lacks the skill, then the trustee must have the ***competence*** to perform the task. If competence is absent, then the trustor will not develop an impression of trust based on the skills of the trustee. Even if the trustor possesses the skills necessary to perform the task sought in the exchange, the trustee may be more efficient in performing the task. This principle of agency theory suggests another antecedent of trust. The trustee must be efficient ***(efficacy)*** in the performance of the required task. Although these two variables are generated from an analysis of agency theory, they are consistent with the work on interpersonal trust by Mayer et al (1995).

No assertions about the trustee's motivations take place in this evaluation. Rather the trustor is simply assessing the trustee's competence and efficiency. Although the motivations of any potential trustee are important, they are not the only concern. If

motivation were the only antecedent of trust, then trustors would have a group of trustees that were perhaps well meaning but unable to complete any of their assigned tasks.

Benevolence

We know from agency theory that principals and agents have different interests and that this is the primary cause for moral hazard in agency relations. Knowing something about an agent's interests and motivations will help mitigate this problem. Three variables help the trustor assess the attractiveness of the trustee on this issue: benevolence, values consistency and values compatibility. The following section discusses benevolence.

Knowing something about the trustee's motivations and interests is even more critical in situations where trustor intervention is physically impossible or prohibitively expensive once the task has been delegated. Despite the limited opportunity for principals to intervene, the agent (trustee) is expected to act in the interests of the principal (trustor). The minimal condition implied on the trustee in this expectation is that he/she should do no harm to the trustor. However, a truly valuable trustee is expected to go a step further. Gouldner (1960) characterizes these are two separate tasks: do the trustor no harm and do good for the trustor. However, we see these as degrees of the same task. For example, the most valued trustees have a personal orientation for the trustor in which the trustee genuinely seeks good for the trustor. If this is the case, then doing good for someone automatically means avoiding harming them.

This claim and the associated assumptions represent a basic control problem of agency and occupy a great deal of scholarly effort. The agency claim of differing interests presented in agency theory and subsequent work trying to reconcile principal/agent goal differences suggests the next variable important to this study of

interorganizational trust. Namely, if the trustee has a benevolent orientation for the trustee, then the trustee will be more likely to trust the trustee.

H5: The trustor firm's assessment of a benevolent orientation held by the trustee firm will be positively related to trust in the trustee firm

This variable is virtually the same variable used by Mayer et al (1995) in their conceptualization of interpersonal trust. These scholars define benevolence as,

> "...the extent to which a trustee is believed to want to do good to the trustor, aside from an egocentric profit motive (Mayer et al., 1995 p.718)."

Although the concepts are very similar, there is a difference that comes from the fact that benevolence in this case is derived from agency theory. Thus, there is an assumption that trustor's and trustee's interests will still differ. While having a benevolent agent is certainly possible and generally desirable, it does not mean that the interests of the two parties will congeal into a common set. It is not impossible to imagine a scenario where a benevolent trustee acts for the good of the trustor and these acts run contrary to the desires of the trustor. In this situation the trustee might say something like, "I know this is not what you want, but I'm doing it for your own good." Thus a lesser standard of having a benevolent orientation is set to reflect the realities of the business to business environment.

Benevolence, a variable this study claims as an antecedent of interorganizational trust, is easily confused and thought to be synonymous with trust. Thus, the definition and description of benevolence is critical. Mayer et al (1995) define benevolence as,

> "...the extent to which a trustee is believed to want to do good to the trustor, aside from an egocentric profit motive (p.718)."

The problem encountered with benevolence is that it is easy to confuse a trustor's perception that a trustee wants to do good for the trustor with the trustor's trust in the trustee. If this is true the best case is that the variables are confounded, the worst case is that they are the same construct.

This erroneous conclusion occurs because of a failure to consider the other variables that help to predict the creation of trust. If benevolence is present in the absence of other antecedents, then a situation is created wherein a trustee desires to be good to the trustor. However, the trustee lacks the ability to complete the task or possesses a set of values that the trustor finds inappropriate. Just because a trustee desires to be good to a trustor, does not necessarily mean that the trustor will trust him/her. If the trustee has no ability, or lacks integrity, then a trustor will not trust him/her to complete the desired task.

In their article, Mayer et al (1995) note the importance of an attachment between the trustor and trustee. However, this provision is not a part of their definition of benevolence. Since this study recognizes the value of including the concept of a personal attachment between the trustee and trustor, a new definition of benevolence is offered. For this study, benevolence is defined as the extent to which a trustee will do good for the trustor because of a personal orientation to the trustor. The distinction between this definition and the one offered by Mayer et al (1995) is that the latter definition explicitly recognizes Mayer et al's contention that gestures of goodwill are only recognized as benevolence when they are being performed for the good of the trustor and not because of an ulterior motive held by the trustee.

As a trustor becomes conscious of goodwill from the trustee that is not attributable to ulterior motives, the trustor senses that the trustee is benevolent. Nothing about this description precludes organizations from being described as benevolent. Just

as individuals have orientations towards each other, organizations can share this condition. The Firestone/Ford relationship prior to the Explorer debacle could easily be described as one characterized by benevolence. Thus, as a trustor firm's belief in the benevolence of the trustee firm increases, so too does the trustor firm's trust in the trustee firm.

Values Consistency

One way that trustors assess the motivations and interests of the trustee is to evaluate the factors that drive the trustee's actions. One of the driving forces of action is the trustee's values. Like the literature on trust, a significant portion of the literature on values examines issues at the individual levels of analysis. However, there is a growing body of literature on organizations. The work on organizational values suggests that organizations are capable of possessing values (Agle & Caldwell, 1999). These values are often identifiable, discussed within the firm and used to help develop loyal employees, vendors and customer. These other entities will often take issue with or identify with the values of the organization. In this way, values function as a set of enduring and preferred end-states that motivate the organization' actions and help others interpret the organization's interests and motivations (Rokeach, 1973).

Remembering the earlier passage on adverse selection, it is important for the trustor to know as much about the trustee as possible. One way for a trustor to evaluate the trustee is to assess the trustee's values. This assessment has two distinct components. Part of the trustor's evaluation assesses the consistency with which the trustee applies his/her values. Plainly stated, if the trustor senses that the trustee will act in a capricious fashion despite being responsible to others, the trust is damaged. If however, the trustor

senses that the trustee's actions are predictable based what the trustor knows about the trustee's value, then trust is fostered.

H6: The trustor firm's assessment of the values consistency of the trustee firm will be positively related to trust in the trustee firm

Values Compatibility

The second component of the trustor's evaluation of the trustee's values also derives from the agency problem of adverse selection. Agency theory suggests that trustor and trustee interests are going to differ. However, differences in these interests can be minimized if the trustee identifies share common interests with the trustee.

Sharing common values, or having some level of values compatibility is a partial solution to adverse selection and is predicted in the literature on social identity theory, although social exchange theory does not refer to these problems in agency terms. The power of group identification and similarity of interest is a powerful mechanism in fostering trust. Podolny (1990) suggests that trust is fostered when parties identify ideological similarities and that they are complimentary. This statement helps identify the fact that the values do not have to be identical. However, at a minimum they must compliment each other.

For example, Ford might view as compatible Firestone's value of profit maximization if it believes that this will help Ford get the best products that Firestone can offer. Ford and Firestone might not share the profit maximization value. Yet, Ford can certainly appreciate the compatibility of this Firestone value with its own objectives.

Adherence to a set of standards that the trustor finds objectionable can engender feelings of respect but not of trust. The example noted in Mayer et al (1995) is that of a trustee's adherence to the principle of profit seeking at all costs. They suggest that this

value will not engender trust if the trustor does not also value profit seeking at all costs or does not see this as a value complimentary to their own. The bottom line is the values of the trustor and the trustee are at a minimum complimentary, and better still are similar, the trust between the two parties is more likely.

H7: The trustor firm's assessment of the values compatibility of the trustee firm will be positively related to trust in the trustee firm

Like many of the other variables used in this study, this set of values oriented variables is consistent with the work of Mayer et al (1995). These authors identify integrity as an important factor of trustworthiness between an individual trustor and individual trustee. Their definition of integrity, which come from McFall (1987), suggests that a trustee's integrity is the adherence to a set of principles that are acceptable to the trustor. The authors go on to note that the two important conditions are adherence and acceptability. If both the conditions of adherence and acceptability can be met, then integrity will lead to greater trust between a trustor and a trustee.

Conclusion

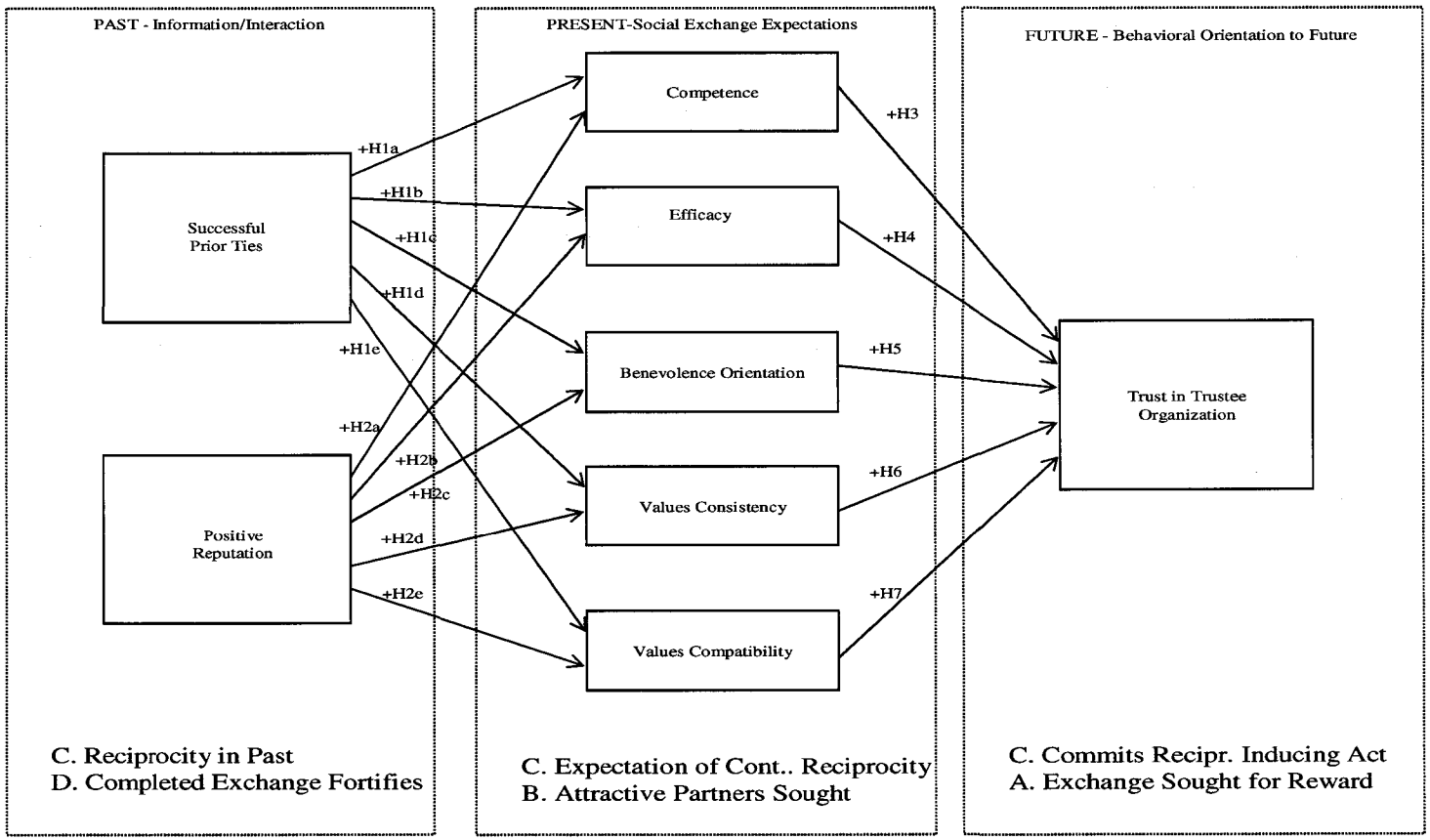
The aforementioned variables come from the application of two theories to the phenomena of organizational trust. Social exchange theory is used to frame this issue and helps establish a time frame of past, present and future. In the context of the past, social exchange helps predict the role of *prior ties* and *reputation* as being responsible for informing the trustor's knowledge about the trustee.

In the present oriented context, the problems of agency are used to help identify the qualities that make a trustee attractive, a quality suggested by social exchange theory. One of the basic suggestions of exchange theory is that attractive partners are sought for

exchanges. *Competence*, *efficacy*, *benevolence*, *values consistency* and *values compatibility* are the qualities identified by agency theory that help define an attractive partner. Finally the dependent variable, *Interorganizational Trust* is described as a behavioral orientation to the future.

These variables, although derived through theory, are consistent with the trust literature. Variants of the variables listed in this model have been identified before. However, the specific relationships identified in this model are unique as is its focus on the organizational level of analysis. Finally, this is the first model of interorganizational trust to integrate social exchange and agency theory. The operationalization of this model will be conducted and described in the next chapter.

Figure 1 – Model of Interorganizational Trust



CHAPTER 4 – RESEARCH METHODS

This chapter contains a discussion of the study's research methodology. Included herein are discussions of the study's setting (organizations involved with clinical trials) and sample, data collection methods, a description of the study's dependent, independent and control variables, measures of each variable, and an overview of the data analysis methods. In the section discussing the study's measures, there are sections for the operational definitions of the variables and a description of the items used to test each variable. While the primary method employed for this study is quantitative, some qualitative techniques were used to develop the constructs and survey instrument. These are discussed after a discussion of the setting.

Study Setting

The study's setting is organizations involved with clinical trials. The clinical trial setting was selected for this study because it is ideally suited to the study of trust. Failures in clinical trial work can have catastrophic outcomes. Despite the risks, there are huge potential profits awaiting companies that successfully guide a compound through the lengthy approval process. Given the risks in the industry, having work conducted by other firms requires a considerable degree of trust or extensive monitoring and controls.

There is a great deal of complexity in the clinical trial environment. For a more complete description of the clinical trial process than the one presented below, please refer to *Appendix A – Clinical Trial Process*.

Testing New Drug Compounds in Clinical Trials[11]

There are three kinds of organizations involved in clinical trials. First, there are firms that are referred to as ***sponsors***. These sponsors tend to be pharmaceutical firms, medical device firms, and biotech firms. These firms develop the drug compounds (or in the case of device firms, mechanical devices), initiate testing, and determine the extent of outsourced clinical trial work. Ultimately, the FDA holds the sponsors responsible for the NDA submission, its contents, and the future performance of the tested drug.

Second, there are organizations that serve as agents to help administer the clinical trial. These organizations are referred to as ***contract research organizations*** or ***site management organization*** **(CROs)**[12]. Although the level of CRO involvement in outsourced clinical trial work varies across contracts, the overriding feature of all work involving CROs is that someone outside the hierarchy of the firm that developed the compound is involved in a sensitive and costly aspect of the business. The FDA views the CROs as service providers working for the sponsor, or in some rare cases, the sites. As such, they are not held responsible for the contents of the NDA. Thus, their participation on a clinical trial is not consistently reported in the NDA (Jones, 2001). The only responsibility held by the CRO is to the sponsor, and this responsibility is legally limited to the terms of the contract.

The final organization in the clinical trial process is the ***site***. These organizations are responsible for recruiting subjects and conducting the clinical trial. The sponsor, and

[11] Although much of this information is publicly available, much of this information was provided to me in personal correspondences with Carla Frye, PharmD., B.C.P.S.; David Watkins, M.S., Ph.D., M.D.; and Gary Lightfoot, PharmD.

[12] From this point forward, the term CRO will be used to stand for any contract based vendor, including Contract Research Organizations, Site Management Organizations and Academic Research Organizations

in some rare cases the CRO, develops a protocol. The protocol is a document that governs most aspects of the clinical trial. The protocol includes but is not limited to sections that describe the eligibility of patients, the number of sites and individuals from each site to be used, the types of information to be gathered about patients, how the drug regime is to be administered, the timing of the study, how often monitoring will occur, and numerous other details. These organizations consist of university medical centers, hospitals, and private physicians. Unlike CROs that rarely receive much scrutiny from the FDA, the individual physicians, also known as investigators, are responsible to the FDA for their conduct and proper administration of the clinical trial protocol. Physicians can and are sanctioned by the FDA for the inappropriate behavior in the conduct of a clinical trial. Examples of sanctionable behaviors include falsifying data, failing to closely monitor patient health, and unlawful dispensing of the compound being reviewed in the trial.

Since CROs are increasingly involved in all phases of clinical trial, there is no attempt to control for this in the study. In essence the phase in which the clinical trial is taking place is not of interest. Rather the exchange relationship between the sponsors and the CROs is the focal point of this study.

Two factors should create an environment that only functions because of a heavy reliance on trust. First, these tests are strategically critical to the sponsoring firms. Second, due to the fact that the tests involve the safety of potentially thousands of human subjects and an even greater number of potential consumers, trust is a critical commodity.

(ARO). Whereas the CROs and SMOs are usually for-profit firms, the ARO is more likely to be affiliated

Sample

This study utilizes a sample of employees of sponsors who are engaged in the administration of clinical trials. The access to these subjects was secured through the participation of the Association of Clinical Research Professionals (ACRP). The ACRP is a member organization of approximately 15,000 professionals. Of the ACRP's members, approximately 40% work for sites, 25% work for CROs and 25% work for sponsors. The remaining members work for other types of vendors or organizations. While all members of the ACRP play a role in clinical trial research, this study's sample only included members who are employed by sponsors since they are the key subjects who should be able to rate CROs if they engage in outsourcing of clinical trial work.

The member database of the ACRP was used to pull the sponsor respondent list (name, email, address, phone), and this query generated a list of 1,627 potential study subjects. These subjects were solicited with a jointly sponsored email from the ACRP and the Berg Center for the Study of Ethics & Leadership at the University of Pittsburgh's Katz Graduate School of Business. A copy of this email cover letter is included in *Appendix C – Study Correspondence*. The email included a hypertext link to a web site that contained the survey instrument. In order to encourage participation in the study, subjects were offered the opportunity to win a $500 prize for completing the study.

Use of individuals for organizational data

Since this study used the completed surveys of individual subjects to draw organization level conclusions, steps were taken to minimize the potential for levels of analysis issues like aggregation bias. Items on the survey were carefully phrased to focus

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with a university teaching hospital.

on factual rather than perceptual issues. For example, rather than asking individuals whether their firm trusts CROs, the survey asked the individuals whether their firm shares vulnerable data with these firms. Further, the instructions included a note to respondents to ensure that their answers on the survey reflected firm level responses, rather than individual perceptions.

Data Collection

Two primary methods were used to gather data: qualitative and quantitative. The qualitative method involved the use of a set of semi-structured interviews with experts in the field of clinical trials. A series of similar questions were asked of each subject. These questions used to guide discussions are included in Appendix 1 – Survey Development Documents. The questions for each subject varied based on the position and role that the subject held, required follow-up probes, and on information gleaned from prior interviews. These interviews were conducted in order to verify the appropriateness of the variables developed in the theoretical model and again later to test the applicability of the instrument to the clinical trial industry.

To empirically test the model, a structured survey technique was used with a large sample size to gather quantitative data. A web based version of the survey was created and hosted on a server provided by Butler University. Respondents completed the survey on-line, and the data was collected and housed using a Sequel Server program. A Microsoft Access portal was created to assemble and clean the data for analysis.

The data collected from this web based survey were used to formally test the theoretical model and are described in detail on the forthcoming pages.

Variables Measures

To enhance understanding, a table containing the variable names, variable definitions, and survey items used to measure these variables was created. It is included herein as Table 4. Listed below are more extensive descriptions of the variables.

Dependent

Interorganizational Trust

The dependent variable in this study is *interorganizational trust.* However, given the orientation of this study, we are not testing both exchange partners perceptions of trust in each other. Instead, this study is inquiring about one organization's level of trust of a specific exchange partner. While still interorganizational in orientation, the focus of this study is on one side of the relationship. Thus, the measurement of this item is strictly focused on assessing a trustor organization's trust for a trustee organization.

Six items are used to measure interorganizational trust. Although many of the items on the instrument were taken from the validated instrument created by Mayer & Davis (Mayer et al., 1999a), there items for overall trust suffered from a lack of reliability. Because of this, and the fact that this study is interested in interorganizational rather than individual trust, only one of Mayer & Davis' (Mayer et al., 1999a) items are used. Additional items come from two previously developed surveys on trust (Cummings et al., 1996; Zaheer et al., 1998). The latter study specifically attempted to examine interorganizational trust and did so by aggregating the responses of individuals. The remaining items were developed as part of the semi-structured interviews described earlier in this section. These questions aim to identify behavioral manifestations of

interorganizational trust by asking specific questions about the practice of clinical trials. Consistent with this study's stated definition of trust, the survey items assess the presence of definitional elements like willingness, vulnerability, expectation, performance and monitoring.

Independent

Prior Ties

As stated earlier, this study believes that the antecedents of interorganizational trust have two sources. One of these sources is *successful prior ties*. This construct is measured using a series of survey items that discuss the outcomes of previous interactions with CROs. Since this characterization of prior ties is different than previous work, the items were created specifically for this study. The remaining items were developed as part of the semi-structured interviews described earlier in this section. These questions aim to identify behavioral manifestations that might result from a successful prior relationship with a CRO. Such things as goal achievement, and the increased likelihood of using the CRO again because of a successful prior interaction, were included in the items.

It was initially believed that when a drug's sponsor submits an NDA, the documents would include information about the use of CROs in clinical testing. Had this been the case, the number of prior ties could have been drawn from a complete collection of NDAs as filed with the United States Food and Drug Administration. However, this supposition proved to be inaccurate. Thus, this study will measure this variable with survey items. This technique differs somewhat from previous attempts to gather data on prior ties (Gulati, 1995). Whereas Gulati used alliances as evidence of a transaction, this

study is not concerned with alliances. Instead, this study is concerned with outsourced contracts. Thus, while the transaction is common to both Gulati's study and this study, we differ on the transaction that we are studying. The other difference between this study and Gulati's is that he had access to archival data. Alliances, as studied by Gulati, receive far greater press coverage and can be tracked in the popular press. The use of CROs for outsourcing clinical trial work is not generally announced. Further, both parties are reluctant to discuss the use of CROs. Thus, commercially available information gathered by such groups as trade organizations, industry consultants and industry analysts is not available. An extensive review of the pharmaceutical and clinical trial oriented literature was conducted. Of all the literature considered a trade publication, one called "The Pink Sheets" offered the best hope of identifying an archival source of information on prior ties as it often announces joint activity in the pharmaceutical industry. Upon further investigation it is apparent that "The Pink Sheets" provides good coverage of joint ventures and alliances in the pharmaceutical industry, but gives only spotty coverage of clinical trial outsourcing.

One other source was examined for its potential to provide archival data on clinical trials. The Tufts Center for the Study of Drug Development maintains a database called The Tufts CSDD Approved Drug Database. Despite containing a wide array of information about each NDA and its sponsoring firm, the database does not contain any information about the use of CROs in achieving NDA approval.

Because of this dearth of archival information, this study relies on the responses of the decision critical personnel in clinical trials departments to answer survey items that elucidate their perceptions of prior ties. Since some of these individuals may not be privy

to all of outsourcing contracts with a given CRO, respondents were allowed to choose up to 4 CROs as the question referent.

Reputation

The second source of information that helps generate the antecedents of organizational trust is firm reputation. Items to measure this variable were developed from the Fortune magazine's "Most Admired Companies" survey. While this variable is not focused on admiration, Fortune includes a reputational element. Justification for this approach was drawn from Staw & Epstein's (2001) "Administrative Science Quarterly" article on management techniques and firm reputation. These authors operationalized corporate reputation by using Fortune's eight corporate reputation elements: (1) innovativeness, (2) quality of management, (3) quality of products/services offered, (4) long-term investment value, (5) financial soundness, (6) ability to attract/keep talented people, (7) community/environmental responsibility, and (8) use of corporate assets.

Unlike the Staw & Epstein (2001) study, some of these elements are not appropriate to the clinical testing environment. For example, in most cases the survey respondents are not adequately informed about a CRO's long-term investment value and use of corporate assets. The remaining elements were used to develop four survey items to assess the firm reputation of the CROs.

Competence

Items on the survey will be used to measure an organization's competence. Four competence related items were drawn from Mayer & Davis' (1999a) instrument that included questions about ability. Only the competence-oriented questions were used, and they were modified to reflect the study's orientation towards organizational level issues.

Loosely interpreted, competence is the measure of an individual's capacity to do what they say they will do. It does not speak to efficiency, motivation or goal compatibility. Thus, subjects will be asked to evaluate such things as the skills and competence of the CROs performing the outsourced work.

Efficacy

Items on the survey will be used to measure an organization's efficacy. Despite the fact that Mayer & Davis' (1999a) characterization of ability includes efficacy, their instrument did not include any *efficacy* specific items. Two items were taken from the Cummings & Bromiley instrument and four items were created based on the semi-structured interviews discussed earlier. Loosely defined, efficacy is the effectiveness with which a task is completed. While the organizations may be competent enough to finish a task, it may take them far too long for outsourcing to be economically viable. Efficacy is about efficient completion of the task. It does not speak to skills, motivation or goal compatibility. A good measure of it would be to analyze an organization's output for a given set of input. Thus, subjects were asked to evaluate such things as contract timing, completion dates, timing of promises kept.

Benevolence

Similar to the measure of competence, three items from Mayer & Davis (1999a) will be used to assess a CRO's benevolence. Although modified to reflect the organizational context of this study, these questions are virtually the same as those reflected in Mayer & Davis (1999a) as the variable is the same. The Mayer & Davis work has been replicated elsewhere and creating new items to measure benevolence is unnecessary. One item was created based on the semi-structured interviews discussed

earlier. For the purposes of this study, benevolence is an organization's willingness to show goodwill towards the trustor. In this case, the CRO were evaluated by members of the sponsor firm who have knowledge of the CRO gestures of goodwill towards the sponsor.

Values Consistency

Similar to the aforementioned measures of competence and benevolence, 3 items will be used from Mayer & Davis (1999a) to assess a CRO's *values consistency.* These items were modified to reflect an organization level referent. One item was created based on the semi-structured interviews discussed earlier. Values consistency refers to a firm's adherence to a relatively unchanging set of standards or principles. The focus of these items was on perceptions of behavioral manifestations exhibited by firm (e.g. do they keep their word).

Values Compatibility

Values compatibility is similar to the notion of values consistency and in the work of Mayer et al (1995)and Mayer & Davis (1999a) combine to form their construct integrity. Thus, two of their items were modified for use in this study to measure values compatibility. However since more items were needed to test the construct, two additional items were taken from another trust article that was interested in values. Young-Ybarra & Wiersema's (, 1999) work yielded two items that were modified for inclusion in this study. These two items were altered to reflect this study's organizational level of analysis.

Control Variables

In an effort to more accurately specify the trust relationship between sponsors and CROs, a series of control variables were generated. Based on the semi-structured interview process and feedback from industry experts, the following control variables were developed for inclusion in the data analysis:

Type of Firm

As noted earlier, there are three types of firms involved as sponsors in clinical trial work: pharmaceutical firms, biotechnology firms and medical device firms. Of these three, pharmaceutical firms have been around the longest and many of these firms are very large. As a result of both size and structure, pharmaceutical firms are more likely to have in-house clinical trial management departments. Biotechnologies firms, and to some extent medical device firms tend to be much smaller and are not likely to have their own clinical trial management group. Thus, whereas biotech and medical device firms are forced by size and lack of expertise to outsource their clinical trial projects, pharmaceutical firms are faced with a *make or buy* decision regarding clinical trials. It was the consensus of many that pharmaceutical firms also have a culture of, "we do it ourselves, unless we are too busy."

The implication of this situation is that biotech and medical device firms were more likely to be dependent on CROs and would therefore work harder to create a partnering atmosphere that fosters trust. Pharmaceutical firms were more likely to be in a position to dictate terms and to critically evaluate the CRO's output. On the instrument, respondents were asked to indicate their employer's firm type. This information was coded as dummy variables using 0 and 1.

Tenure

One variable that was presumed to have an impact on trust was the length of the firm member's tenure with the firm. It was commonly felt that firms using employees that had more time with the firm would be more likely to trust their CROs. This consensus of the industry experts is consistent with relational based trust literature that indicates the importance of opportunity to develop an ongoing relationship. It was felt that a critical point is reached once the person has been with the firm more than two years. Thus, tenure with the firm was operationalized as more than two years or less than two years. A question was included in the demographic section of the instrument and the results were set up as a dummy variable. The variable was coded using 0 and 1.

Authority Level

Another variable that was presumed to have and impact on whether a firm was more likely to trust their CROs was the authority level of the employees involved with outsourcing. The presumption that was apparent from the semi-structure interviews was that all too often low level employees, with little internal authority are charged with managing the CRO relationship. Further, it is presumed that those with less authority are less likely to foster trust between the two firms because of their inability to make any substantive changes within their own firm.

To measure this construct, respondents were asked whether they managed others. The operationalization of this construct implies that those with the authority to manage other people are more likely to have authority to make other kinds of within-firm changes. A dummy variable was established with coding 0 and 1.

Preferred Vendor List

Yet another condition that was identified during the semi-structure interview process was the fact that some sponsors have begun to implement preferred vendor programs. As a part of most preferred vendor programs there is an evaluation process of the potential vendor. The process might be a simple as a financial background check and as extensive as a face to face team-building activity. The presence of a preferred vendor list implies that some minimal level of relationship building may have occurred and should therefore be factored in an analysis of firm trust.

Respondents were asked to indicate whether their firm used a preferred vendor list. Responses were coded as 0 or 1 indicating the presence or absence of a preferred vendor list. A dummy variable was established for inclusion in the data analysis.

Common Measurement Techniques

All of the variables in the model share a common measurement technique. Rather than repeat the description of this measurement technique for each variable, the technique is described here.

Since this study is conducted at the organizational level of analysis, yet the data is gathered from individuals it is necessary to address levels of analysis concerns. Similar to other work that operationalizes individual data gathering techniques at the organizational level of analysis, this study operates with the assumption that as the critical contacts between a sponsor and a CRO, the study's respondents represent and can accurately reflect the positions of their firms. As the focal point of the dyadic relationship, the respondent is both individual and organization in their actions.

In her work on levels of analysis issues, Rousseau (1985) notes that work in organizational studies is inherently mixed level. Thus, while methodology has been the primary means used to fix cross level problems, theory is the best way to validate

> "using data from one level to represent something at another level (Rousseau, 1985 p.3)."

Her suggestion is that scholars need to address levels issues by providing some type of composition theory in order to properly support the use of lower level data as a construct valid way of representing higher level phenomenon.

Numerous attempts to identify global (higher level) manifestations of interorganizational trust were made. This attempt is consistent with Roberts, Hulin & Rousseau's (1978) claim that global data are better than aggregated data. However, the work of CROs is highly specialized and not well understood by individuals outside the healthcare community. Because of the uniqueness of CRO work and the confidentiality agreements that are common to this industry, attempts to identify global measures of interorganizational trust and its antecedents were not fruitful.

Returning to the individual level in order to test this study's organizational level activity means considering Rousseau's (1985) recommendation for composition theories. Simply stated, a viable composition theory that suggests the appropriateness of using individual level responses for this study is that the individuals from within a firm are largely reflective of the firm's trust in a particular CRO. This approach implies that organizational setting or processes have little impact on the development of organizational trust or that representative individuals can reflect accurately the firm's trust in a CRO. In the case of clinical trials, a compositional theory is readily available.

In clinical trials, a small number of people in the firm have very intimate knowledge of the CROs who provide the sponsor with clinical trial management services. Further, CROs do not provide a wide array of services, and few other people in the firm have an opportunity to interact with the CRO. For example, people in larger departments like brand management, sales, and manufacturing are not likely to know anything about the firm's clinical trial outsourcing activities. Thus, when the firm attempts to codify the relationship with a given CRO, the opinions of a few select representatives can be expected to accurately reflect the organization's behavior and codified records.

This kind of approach finds support in the work of scholars like Drexler (1977), James (1982) and Nelson & Winter (1982). In particular, Nelson & Winter (1982) suggest that organizational learning routines are strongly similar to individual skills and process. Because of a lack of other "setting" variables, individual skills and processes are reflective of organizational learning routines. With these facts in mind, it is not inconsistent to suggest that the individuals in the clinical trial departments largely form the organization's trust in a particular CRO. Thus, assessing these individual's perceptions of firm behavior and CRO qualities is an acceptable way of measuring the organization's trust in a particular CRO.

After assessing various ways to gather individual perceptions of trust in a CRO, it was determined that the best possible approach was to survey the decision-critical members of the clinical trial teams. Measuring interorganizational trust in this fashion is consistent with the empirical work performed in a study by Zaheer, McEvily & Perrone (1998). In an examination of interorganizational trust in the electronics component industry, these scholars used surveys administered to individuals. These authors mailed

surveys to key purchasing agents at each trustor firm and asked them to comment on both individual and firm level issues.

Quantitative Survey Instrument

The survey was administered via a web-based survey as described earlier. The instrument was constructed by the study's author as there is a dearth of empirical, organization-level trust research, and the uniqueness of the industry further limits the use of previously developed instruments. Despite the need to create new items for the instrument, the survey utilized some survey items from existing instruments at both the individual and organization level of analysis (Mayer et al., 1999a; Zaheer et al., 1998).

Survey Development

The unique nature of the industry made developing a survey that has face validity more difficult. Three techniques were implemented to improve the clarity of terminology, ease of completion and potential ambiguity.

Literature-based Sources

First, using the extant literature on trust as a base from which to draw instrument items, an initial draft of the instrument was developed. To the extent possible, previously validated scale items were used. However, most of these items required modification to fit the industry and level of analysis. The modifications and remaining items were shaped by information gathered from clinical trial trade publications and a series of semi-structured interviews conducted with clinical trial knowledgeable people.

Conceptually Oriented Expert Opinion

With a preliminary survey instrument in-hand, the second phase was to assess the instrument's industry appropriateness. Using a list of clinical trial outsourcing experts generated in the first phase of survey development, experts were provided with a copy of the instrument and asked to comment.

One individual who was asked to opine on the survey was Ken Getz, CEO of CenterWatch. As the head of CenterWatch, Mr. Getz has been instrumental in creating an organization that is known for its tracking and assessment of trends in clinical trials. CenterWatch describes itself as,

> "...a...publishing and information services company. We provide information services used by patients, pharmaceutical, biotechnology and medical device companies, CROs and research centers involved in clinical research around the world."

As a part of this mission, CenterWatch surveys members of the clinical trial industry to detect changing trends, capture best practices, and focus attention on particular therapeutic areas. These surveys are published in a monthly publication called the CenterWatch Newsletter. Most of these surveys are conducted with the supervision of CenterWatch's CEO Ken Getz. Mr. Getz was provided a copy of the early version of the survey and recommended some changes to improve its applicability to clinical trial issues, structure, and terminology.

Gary Lightfoot offered another expert opinion. Mr. Lightfoot's experience with clinical trials is extensive. He worked for more that twenty years with the pharmaceutical firm Eli Lilly & Co., where his duties included overseeing clinical trial outsourcing. After his tenure with Lilly, he worked for a leading CRO called PPD Pharmaco (now

called PPD). Presently, he is an industry consultant engaged by sponsors, CROs and SMOs to help improve clinical trial outsourcing efficiency. At most of the clinical trial outsourcing conferences held in the United States, there is a high likelihood that Mr. Lightfoot's name will appear on the agenda as a presenter or moderator. Mr. Lightfoot's influence on the nature of the questions asked and the focus of the questions was extensive.

Dr. David Watkins offered yet another expert opinion. Dr. Watkins' knowledge of the clinical trial industry comes from his years working for the University of Pittsburgh Medical Center (UPMC). In his last position with UPMC, Dr. Watkins was responsible for streamlining the interaction between clinical trial investigators and the Sponsors/CROs. After a similar stint with Harvard Medical School, Dr. Watkins established himself as an industry consultant and has established a business that helps hospitals streamline their operating room procedures (Gaynor, 2002). Dr. Watkins shared comments related to the importance of trust in clinical trials, and he suggested modifications that would elucidate questions that highlighted a lack of trust.

Instrument Pre-test

The third method used to help improve the validity and industry appropriateness of the instrument was to gather input from industry participants in a pre-test of the instrument. To simplify the process of gathering this input, the author attended a conference on outsourcing in the clinical trial industry. The conference, entitled *Sponsor & CRO Clinical Outsourcing & Partnerships*, was sponsored by the Strategic Research Institute (SRI). The objectives of the conference included bringing together people who

worked for sponsors and CROs to discuss ways in which their interorganizational relationships could be improved.

SRI allowed access to the conference participants. Eight semi-structured pre-test interviews were conducted. The interviewees had a variety of backgrounds. Four of the individuals worked for sponsors, two worked for CROs, and two worked as industry consultants. The interviewees that listed a sponsor as their employer were asked to fill out the instrument and provide comments. The other interviewees were asked to read the instrument and provided comments. Respondent feedback was consistent and easy to categorize with most of the concerns relating to the layout of the sections asking for demographic information, explaining the purpose of the study, and background information on the referent CROs. Few changes were suggested for the section containing the questions that supported the variables listed in this study's model. To the extent that the recommendations of these interviewees could be implemented, they were. In a few cases, the recommendations were not implementable because of practicality or the need to conceal the dependent variable. Example: One interviewee wanted the instrument to disclose what it was measuring. However, so as not to bias the subjects filling out the instrument, the dependent variable was not mentioned in the instructions or in the survey items[13].

Other Instrument Issues

An early concern of this study was potential difficulty in gathering enough responses about CRO relationships. Two methods were developed to address this concern. Rather than have an organizational representative offer an opinion about a

single firm, as was done in the work by Zaheer, McEvily & Perrone (1998), subjects in this study were be asked to offer information about as many as four CROs. Responses about CROs were capped at four because it was revealed in the SRI conference interviews that potential subjects were able to offer information on an average of four firms. Further, it was felt that asking about more than four firms would lower the response rate. Respondent who did not possess knowledge of four CROs were asked to respond to questions on as many CROs as they could.

The second method of improving the number of responses about the same CRO was to provide an incentive for those respondents that completed the survey. A nominal prize of $500 was presented to a randomly drawn respondent. To be eligible, the respondent needed to properly complete the survey and the study needed to have gathered enough responses from the firm to constitute the minimum number required for that firm. In order to leverage the respondents' desire to earn the $500 gift certificate, they were asked to forward the email to three other members of their department and encourage them to complete the survey.

A backup method was available in the event that the initial email did not elicit an adequate response. Should this step have been necessary, I would have utilized contacts at the SRI Conference and at the Institute for International Research's Conference. In a potential request, these contacts would have been asked to encourage departmental participation in the study. With only ten firms cooperating in this process and providing information on four CROs, 20% of the data required for the study could have been gathered.

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[13] This technique was used by Cummings and Bromiley (1996) in the development of their instrument for

Based on instrument pre-tests, the survey took respondents about 15 minutes to complete. Although the number of pre-test surveys was too small to run meaningful statistics, a visual assessment of the surveys indicated that pre-test respondents provided answers that would be likely to provide adequate variance and normality. Respondents tended to use the entire range of Likert scores (scores 1 through 7), and respondents were willing to numerically distinguish between respective CROs (some CROs got higher scores than others).

Methods of Analyses

Since the goal of the analysis is to verify the hypotheses indicated in the proposed theoretical model three steps were undertaken. First, that data were analyzed using descriptive statistics. The goal of this step was to assure that minimal levels of data normality were achieved. Second, reliability scores in the form of Cronbach's alpha were calculated for the various instrument items and their corresponding constructs. Finally, the multivariate technique of hierarchical multiple regression was used to test the existence and strength of the hypothesized relationships presented in the casual map from Figure 1.

All of the analyses for this study were performed using a mixture of Excel spreadsheet functions, SAS statistical analysis and STATA, a command based statistical package. The results of the aforementioned analysis are specified in the following chapter.

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measuring organizational trust.

Table 4 – Constructs / Definitions / Scale Items

Construct	Definition	Scale Item
Successful prior ties	Past interactions that resulted in goal achievement or the identification of a good trustee - **Gulati, 1995 (modified)**	**V30** Work done in the past with ___CRO has helped my firm reach its goals. **V31** Because of positive interactions in the past, my firm is now doing more business with ___CRO **V32** One of the reasons that___CRO is on the list of preferred CRO providers is due to successful past experiences with our firm. (if firm has such a list) **V33** In general, my firm seems to value CRO's with which we have had successful past experiences more highly than those with whom we have had no prior experience.
Good Reputation	A collectively held and publicly available judgment of an organization's constituents based on the performance of the firm in fulfilling constituent expectations. (Modified version of **Fombrun, 1996** and **Waddock, 2002**	**V34** Based on external sources, my firm views ___CRO as an organization with a good name. **V35**Because of things my firm has heard from others, the character of ___CRO is in question by my firm. **V36**Even before my firm worked with this CRO, it was a CRO we viewed as being in good standing in the industry___ **V37** My firm feels that working with __ CRO conveys high status to other firms in the industry.
Competence	That group of skills, competencies, and characteristics that enable an organization to have influence within some specific domain - **Mayer et al, 1995 (modified)**	**V7** _____CRO has specialized skills that can increase my firm's performance. – **Mayer & Davis, 1999;** **V8** ____CRO is very capable of performing the work my firm hired them to do.– **Mayer & Davis, 1999** **V9** Overall, ___CRO is well qualified to do clinical trial work.– **Mayer & Davis, 1999** **V10** _____CRO is known to be successful at the clinical trial work it does. – **Mayer & Davis, 1999** **V11** ____CRO is on the list of preferred CRO providers, in part, because

		of their level of competency at clinical trial work. (if firm has such a list)
Efficacy	The extent to which an organization completes tasks with a minimum of delay and effort	**V12** ___CRO consistently meets the deadlines given by my firm – **Cummings & Bromiley, 1995.** **V13** ___CRO does not consistently meet its deadlines **Cummings & Bromiley, 1995.** - **V14** __CRO is able to complete assigned tasks in the allotted amount of time **V15** __CRO is able to complete the assigned tasks on a timely basis given a minimum of personnel **V16** Tasks that take other CROs a great deal of time are readily completed by CRO___ **V17** CRO is inexpensive and still manages to do a quality job
Benevolence	The extent to which a trustee will do good for the trustor because of an affinity for the trustor - **Mayer et al, 1995 (modified)**	**V18** ____ CRO is concerned about my firm's welfare**. – Mayer & Davis, 1999** **V19** My firms needs are important to _____CRO **– Mayer & Davis, 1999** **V20** _____CRO will go out of its way to clear up misunderstandings with my firm **– Mayer & Davis, 1999** **V21** ___CRO is reluctant to charge us extra because of unforeseen circumstances
Values Consistency	The consistent adherence to a set of principles by the trustee - **McFall, 1987 (modified by Mayer et al 1995 (modified)**	**V22** ____CRO is consistent with respect to what they say and do. **– Mayer & Davis, 1999** **V23** My firm never has to wonder whether ____CRO will keep its word. **– Mayer & Davis, 1999** **V24** When dealing with my firm, sound principles seem to guide ___CRO's behavior. **– Mayer & Davis, 1999** **V25** My firm feels that CRO acts in a predictable manner-
Values Compatibi-lity	A set of principles held by the trustee that are acceptable to the	**V26** The values of ___CRO and those of my firm are very compatible. **– Mayer & Davis, 1995**

	trustor - **McFall, 1987 (modified by Mayer et al 1995 (modified)**	**V27** My firm's goals and objectives for the clinical trial are shared by _____CRO. **– Young-Ybarra & Wiersema (modified)** **V28** _____CRO had similar motives for working on this project. - **Young-Ybarra & Wiersema (modified)** **V29** My firm relates well to the values of ___CRO. **– Mayer & Davis, 1999**
Trust in trustee – Interorganiza -tional Trust	Willingness of a trustor to be vulnerable to the actions of trustee's boundary spanners based on the expectations that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party. - **Zaheer, 1998 & Mayer et al, 1995 (modified)**	**V1** My firm would be willing to give ____CRO a task that is critical even if we could not monitor its actions. **– Mayer & Davis, 1999** **V2** My firm monitors ___CRO less than other CRO's. **V3** ___CRO takes advantage of unforeseen events **– Cummings & Bromiley, 1995** **V4** My firm believes that ___CRO can be relied on to fulfill its obligations. – **Zaheer, 1998** **V5** My firm would feel a sense of betrayal if __CRO's performance was below expectations.- **Zaheer, 1998** **V6** My firm does not re-analyze the clinical trial data provide by ____CRO. **– Cummings & Bromiley, 1995**

CHAPTER 5 - ANALYSES & RESULTS

This chapter reports the analyses undertaken to examine the data and the project's results. The chapter contains the following: a review of each item's descriptive statistics; a discussion of reliability and construct validity; an analysis plan and hypotheses testing, including a discussion of hierarchical multiple regression; and finally, a discussion of supplemental findings.

Sample

Response Rate

The population of sponsor employed ACRP members formed the sample for this study. The ACRP sent a file containing 2,182 emails for these individuals. During a visual review of the file's contents it became clear that there were a number of email addresses for individuals not employed by a sponsor. ACRP data records for each individual contained their title, address and email. Using the location identifiers in the email address, everything following the @ symbol, each record was reviewed to ascertain whether it appeared to be a clinical trial sponsor. For example, if the email address was name@Quintiles.com, it was obvious that the individual works for a firm named Quintiles. In this example, Quintiles is a CRO and not a clinical trial sponsor. In order to eliminate CRO employed individuals from the list, an elimination screening process was created. Any email addresses that referenced a firm name that appeared in the Drug Information Association's *Contract Service Organization Directory* (CSO Directory, 2000) was excluded from population sample. This directory is a comprehensive list of firms that provide clinical trial services to sponsors and are therefore not eligible to

participate in the survey. Using a visual scan of the remaining records, any individual that had an email ending in *.edu* or *.org* was also eliminated from the list as these are academics and trade association employed members.

The final number of sponsor employed members represented in the file was 1,519. The ACRP and I sent an email invitation to these individuals with two reminders sent seven and 14 days, respectively, after the initial mailing. The Web software database captured 661 surveys for a respectable response rate of 44%.

Of the completed surveys there was an 81% failure rate. Surveys qualified for the failure rate if any of the survey's fields were left unanswered. 19% of the surveys contained at least 2/3rds of the information deemed necessary to conduct a rigorous statistical analysis. The determination of a 2/3rds standard is discussed in a forthcoming section on *Missing Data.*

In the surveys used, the average number of relationships described was 2.43. Since relationships were the focal point of the study, the n used for the purposes of calculating statistical power was 304 (125 surveys x 2.43 CRO evaluations). The subject of multiple responses from a single respondent is discussed in greater detail in the forthcoming section **Hypotheses Testing**. Approximately 53 surveys had to be dropped because the respondents filled out only the first half of the survey. Had these surveys been included, the percentage of useable surveys would have been 27%. For a fuller description of these rates see Table 5.

The response rates that corresponded to the initial mailing and the first and second reminders were very similar, each being about 1/3 of the total responses. A third reminder was not considered due to the fact that the second reminder generated a

considerable number of emails from respondents asking to be removed from the list or suggesting that they wanted to be left alone. Since these emails were sent under the auspices of the ACRP to ACRP members, the ACRP did not want to be the source of irritation to its own membership.

Given the fact that the survey was administered via a Web based application the response rate was naturally lower than it otherwise might have been with a traditional paper survey. Prior work suggests that Web and email based surveys are not as likely to yield high response rates (Dillman, 2000). The reasons for this are numerous. First, respondents can easily opt out of the process. This proved to be true of this study's respondents. The computer program set up to capture data recorded a unique respondent record after completion of the first page of demographic questions. As noted earlier, the database recorded 661 unique records which is a response rate of 44% of the sample population. Of this number, it recorded 125 completed records and 535 less than complete records. Thus there was a failure rate (the rate at which respondents fail to complete a survey after having started it) of 81%.

The second reason that Dillman (2000) establishes for low internet response rates is the increasingly frequent use of email as a communications medium. He notes that most people tend to batch process their emails and that this technique is not conducive to completing potentially lengthy surveys. These conditions have been further exacerbated since Dillman's (2000) book was written because of the prevalence of internet and Web based surveys in the last two years. Any novelty that Web based surveys might have has diminished because of the prevalence of on-line surveys. Thus, it is increasingly difficult

to distinguish legitimate on-line research from the throngs of market and sales based inventories directed at Web users.

Contacts within the pharmaceutical industry suggested that they are quite happy with a Web based survey response rate approaching 10% (Kays, 2003). They conclude that given the volume of emails that this study's targeted respondents receive, it is extremely difficult to get their attention. Further, response rate may have suffered because some firms have policies forbidding their employees from participating in studies requesting information about vendor relationships (Jones, 2001).

Non-Response Measurement

In order to provide additional comfort regarding the reliability of the data, the responses were split into two categories: early responders and late responders. This technique is a common method of checking for non-response bias based on the fact that the answers of late responders have been shown to mimic the answers of non-responders (Churchill & Iacobucci, 2002; Clausen & Ford, 1947). Once these categories were established, the aggregated responses for the constructs were compared for the two groups. These tests were run using respondents as the unit of analysis.

For those respondents contributing more than one set of CRO ratings, one set of CRO scores was selected at random to represent that respondent. Because of the nature of the test, as the number of variables increases, so too do the chances of finding a difference between the two categories that is due to sampling error and not actual difference. In order to account for this, an alpha adjustment level technique called the "Bonferroni inequality" procedure was employed (Castaneda, Levin, & Dunham, 1993; Hair, Anderson, Tatham, & Black, 1995). This procedure enhances the significance level

cutoff so that any differences identified between the early and late responders are *actual* differences and not the result of error. The calculation for this procedure takes the standard study alpha level of 0.05 and divides it by two times the number of test being conducted. Since there are eight tests being conducted in this phase (the number of constructs in the study), the denominator is 2 x 8 = 16. The calculation resulted in a significance level cutoff of 0.003 (0.05/16).

The results indicate that there is no reason to believe that late responders answered any differently than early responders. No F score exceeded 2.0 at a significance level of .003. The specific F statistics for each construct are presented in Table 5.

Missing Data

An assessment of the survey data revealed that some of the respondent data records were incomplete. This result was not entirely unexpected as respondents were given the option of placing a zero in the response space for those circumstances when they were not able to answer a survey item. In order to have a better sense of how many records were complete, how many records were incomplete but useable, and how many records were incomplete and unusable, some decision rules were developed to qualify appropriately adequate records.

As a precursor to establishing rules for missing data, two forms of analysis were conducted. First, it was necessary to determine why data was missing. Second, it was important to understand how much data was missing (Hair et al., 1995). The primary reasons for missing data were that: 1) respondents did not work in clinical trial outsourcing, 2) respondents did work with CROs but did not know the answers to the questions, 3) respondents wanted to be included in the prize lottery set up to improve

response rates but did not want to answer questions, or 4) respondents tired of answering questions after the 2nd Web page of questions. It was determined that the first, third and forth reasons for missing data were systematic and likely to skew the statistical analysis. Thus, records that were missing data for these reasons were eliminated from the statistical analysis. In cases where it was clear that the respondent did not work for a sponsor and or did not work with CROs, they were also eliminated from the calculations of the sample size and response rate.

The second reason data was missing was not systematic. When the database columns were observed visually, the open spaces where data were missing were scattered throughout the entire spreadsheet. From this it was concluded that the missing data occurred at random and that it was therefore acceptable to drop incomplete records (Cohen & Cohen, 1983; Nunnally, 1978). The next decision rule to establish was at what level of completeness the record should be in order to justify keeping it in the analysis. Hair et al. suggest this:

> "No firm guidelines exist on the necessary level for exclusion, but any decision should be based on both empirical and theoretical considerations. If missing values are found for what will be a dependent variable in the proposed analysis, the case is usually excluded (Hair et al., 1995)."

However, one trust study that used internet-based surveys used a standard of data records that were 50% complete (Aiken, 2001).

In order to be conservative, I set up two other standards: First, if respondents completed at least two-thirds of the survey they were showing a good faith effort to answer the questions and these records should be considered if the next standard is met. Second, for the survey to be considered useable, respondent had to provide answers to at

least two of the items used to measure the dependent variable. As noted above, it is critical to measure the dependent variable in order for a respondent's record to be included.

Surveys from respondents who answered two-thirds of the questions had missing data randomly distributed throughout the instrument and answered at least two items used to measure the dependent variable were deemed useable. By establishing these three conditions for useable surveys the study minimized the chance that missing data would bias the statistical analysis.

Firms in the Sample Representing the Industry

One quality of interest in this study was the sample's ability to represent the actual activity of the clinical trial industry. In order to assess this aspect this, three lists were compiled from COMPUSTAT. The first list contained the names and sales figures for all members of industry code 2834 – Pharmaceuticals. The seconds list contained the names and sales figures for all members of industry code 3841-Medical Devices. The third list was comprised of the names and sales figures for industry sub-code GICS – Biotechnology. This code differed somewhat from the others in that it was a subcategory of a larger Biotechnology classification. The use of this subcategory was required because of the broad array of firms that classify themselves as biotechnology firms. The subcategory used was a better representation of the firms engaged in human clinical trial activity.

A list of firms that responded to the survey was compiled from the survey database. This list was compared to the three industry lists described above. Using sales figures as a way of assessing industry coverage, the total sales figures of firms appearing

on both the firm sample list and one of the industry lists was calculated. These three totals were divided by the respective industry sales total in order to calculate industry coverage. Of the three industry lists pulled from COMPUSTAT, 86% of pharmaceutical sales, 65% of medical device sales, and 25% of biotechnology sales were represented in this study's sample. While this is excellent coverage there is one potential problem. Due to the concentration of big firms in these three industries, it is possible to get very high coverage with only a limited number of firms.

Two things help mitigate this problem. First, large firms tend to represent a significant percentage of the clinical trials performed. Thus, concentration of large firm in the sample is reflective of kinds of firms performing most of the work in this industry. Second, there were some firms in the firm sample list that were not represented on the industry lists pulled from COMPUSTAT. This phenomenon occurred because the industry lists only show publicly traded firms. Since no adequate list of privately held firms exists for these industries, it is difficult to say with certainty how well represented they are in the sample. However, since only about 20% of the firms on the sample list were not on the industry lists, it is unlikely that they were either underrepresented or over represented in the survey.

Descriptive Statistics

Initial demographic questions asked on the instrument are presented as supplemental findings in the final section of this chapter. An analysis of these items provides a fuller picture of the firm's and firm representatives represented in the sample. The descriptive statistics provided in Table 6 include the type of firm, whether the firm

representative manages others, and whether the firms have a preferred vendor program. In summary, the descriptive statistics show a balanced set of data on the respective firms and firm representatives.

Aside from the demographic and control items just discussed, 37 items were included on the survey instrument to assess CRO relationships. Descriptive statistics like means, standard deviations, and range in values were calculated and presented in both numeric and graphical form. The descriptive statistics were calculated to make an initial assessment of response numbers and response data normality. Based on the calculations presented in Table 7 – Descriptive Statistics of Instrument Items, the data appears to be largely normal.

During this analysis, it was determined that the wording of two items was problematic. Questions v11 and v32 both asked conditional questions that assumed the presence of a preferred vendor list. Since many firms did not have such a list, it was determined that these questions would be inappropriate to include in the measures of the model constructs where no particular assumption about the presence of a preferred vendor list was made. The elimination of these items was facilitated by the fact that there were a sufficient number of items available to measure the constructs. Further, questions v3, v5, v6, and v37 were eliminated from further analysis due to low Cronbach's alpha scores. This issue is addressed in greater detail in the forthcoming section on reliability.

Reliability and Validity

Reliability

Although many of the items on this survey have been previously validated in earlier studies, some modifications of the items were made to accommodate for the unique environment of this study. Further, these items are being used to test trust at a higher level of analysis than previous work. Since the constructs and their relationships were established in the theory discussed in Chapter 2, factor analysis aimed at determining which survey items loaded on the respective constructs is not warranted. Instead Cronbach's alpha reliability scores were calculated to assess whether the survey items load on the theorized constructs and assure that the data are consistent with the expected structure of model as predicted in the theory chapter.

The results of these calculations are presented herein as Table 8 – Reliability Scores. This table indicates that with the exception of F8 - Reputation, all of the reliability scores are at .70 or higher. These results are achieved by eliminating certain items from the analysis. The most significant alteration occurred with F1-Organizational Trust in which three of the six items required elimination in order to get a Cronbach's alpha score of .72. These results are consistent with other work on trust in that overall measures of trust have historically been a difficult to create. Mayer & Davis (1999a) discuss the difficulties they had in obtaining an adequate Cronbach's alpha score. Interestingly, the items created to measure trust based on the semi-structured interviews showed poorer ability to measure trust than the items taken from previously validated instruments.

The reliability score for F8 - Positive Reputation was calculated at .62. While this is lower than is desirable it is not a clear indication that positive reputation was not adequately measured. Nunnally (1978) suggests that on instruments where scoring is not subjective and the instructions are clear present fewer concerns for measurement error. The fact that this study's instrument uses a common 7-point Likert scale suggests that the scoring for this study was not subjective. Further, the fact that subjects provided good measure of F1-F7 suggests that they understood the survey's instructions. These two factors help mitigate concerns about the reliability score for F8 - Positive Reputation. Nunnally also points out that,

> "if coefficient alpha is only .30 for a 40-item test, the experimenter should reconsider the measurement problem (Nunnally, 1978)."

While the forgoing information tends to mitigate the potential for measurement error for positive reputation, it does not fully address the potential for construct issues. It is possible that lower coefficient alphas represent the fact that the construct is not adequately specified. Further exploration of this potential is warranted in future work.

The Cronbach's alphas of the various constructs (F1-F8) suggest that in large part the items selected to measure the hypothesized constructs show a fair degree of reliability. If these calculations had not shown that the survey items loaded on the theorized constructs, it would have been necessary to perform exploratory factor analysis in which no *a priori* assumption about which items relates to particular constructs. Since this was not the case with this set of data, factor analysis was not required.

Intercorrelation

The next phase of the analysis involved taking the independent and dependent variables and measuring them for intercorrelation. The intercorrelations are presented herein as Table 9 – Intercorrelation Tables, Section 1.

A review of this table suggests that some of the independent variables are highly related. Scores in excess of .80 are seen for the relationship between *competence* and *values consistency*, *efficacy* and *values consistency*, and *values compatibility* and *benevolence*. This condition suggests the presence of multicollinearity. The danger presented by multicollinearity is that standard error is likely to be inflated. The result of this condition is that it will be more difficult to reject the null hypothesis and significance will be difficult to establish. In other words, it will be difficult to identify small effects, thus incurring a type II error (finding no relationship when one does exist).

The cause of multicollinearity in this study is twofold. First, numerous studies of trust have shown that it is difficult to create a comprehensive model of trust in which the independent variables are not highly correlated. The multicollinearity condition is found in Mayer & Davis (Mayer et al., 1999a) and Zaheer, McEvily and Perrone (Zaheer et al., 1998). Second, the very structure of the model itself is nurturing the conditions of multicollinearity. Consider the fact that at the far left of the model, two exogenous variables (*successful prior ties* and *positive reputation*) are established as the sources for five mediating variables (*competence*, *efficacy*, *benevolence*, *values consistency*, and *values compatibility).* The effect of this situation is that only two variables are responsible for predicting five variables. In conceptual terms, the five variables could

only come from two sources and are therefore highly related much as five children from the same set of parents. It would be difficult for the mediating variable not to be related.

The causes of multicollinearity are somewhat expected in this study. The problem this presents is that it reduces the chances of identifying a significant result. However, it does not bias the estimation of the parameters. If it did, it would be of significant concern.

In an attempt to increase the chances of finding an effect, a technique was used that somewhat mitigates the effects of multicollinearity. Although the raw data exhibit all the traits of normality, for the purposes of mitigating some of the multicollinearity effects, the raw scores were standardized. This technique helps by making sure that *response-style effect*, the effects of overly generous (those using only the upper end of the scale) or overly stingy reviewers (those using only the lower end of the scale), do not exacerbate the problem of multicollinearity (Hair et al., 1995). This technique, sometimes called *within-case standardization*, is often used in attitudinal research were there is no desire to identify groups with the sample according to their response style. Instead, this study is interested in the relative importance of one variable to another. A modified correlation table using the standardized scores is presented below and shows far less intercorrelation than the previous table that used non-standardized data. Because of the results reflected on the second section of Table 9, standardized scores were used in the regressions that will be described later in the chapter.

Hypotheses Testing

Analysis Plan

According to Cohen & Cohen (Cohen et al., 1983), statistical power is a function of four things:

-the power of the test, defined as 1-B(the probability of rejecting the null hypothesis)
-the alpha level
-sample size n
-magnitude of the effect

Some of these are determined as a matter of course, like the sample size, while others are subject to interpretation. However, this study will use fairly conventional forms of the subjectively determined items. Cohen (Cohen, 1988) suggests that when considering effect sizes, .02 is a small effect, .15 is a medium effect and that .35 is a large effect. In light of this, desired power has been set at the traditionally established level of .80, while the alpha has been set at .05 for a two-tailed test. If the population effect size were .20 then a sample n of 193 (Cohen et al., 1983) would be required to identify the effect. While this population effect size may be a bit too large given the subtleties of trust research, the sample n for this study is nearly double the recommended number of 193. Thus, the power statistics for this study are reasonable in light of the expected effect size.

Regarding the significance of alpha at .05, Cohen (1988) has suggested that relaxing the standard to .10 allows for the detection of smaller effects. Although not adopting .10 as the level of significance, relationships that are significant at this level will be reported for informative purposes.

Multiple Response Format

The focus of this study is interorganizational relationships. Thus, the *n* for this study is the number of CRO relationships rated, not the number of individual respondents obtained. Since there was initial concern about obtaining a large enough n to achieve adequate statistical power respondents were asked to report on up to four CRO relationships. In calculating regressions, one of the standard assumptions is the assumption of independence of all observations that contribute towards the *n*. Since many individuals rated more than one CRO relationship, the assumption of independence is less certain. Although there are good reasons to believe that multiple responses from the same individual are independent, steps were taken to account for the possibility of non-independence.

In each of the regression models that will be discussed shortly, the error term was controlled by clustering it with a group of responses (Stata, 2001). In this case, the respondent identification number (ID) served as the group identifier. Thus, the error term was controlled for within each respondent's answers. Evidence of this accommodation is identified on Appendices 1-12. Near the middle of each appendix is a short line saying...

"Number of clusters (respid) X"

The value of presented is typically between 122 and 125 as this is the number of respondents for the respective analysis.

Hypothesis 1

Hypothesis one(a) considered the relationship between positive prior ties with a vendor and its impact on competence expectations. It was hypothesized that the more successful ties two firms had, the more likely that the sponsor would perceive the CRO as

competent. The positive relationship described in this hypothesis was supported. Support was indicated by a t-score of 5.69 ($p<.001$). The full regression is presented in Table 10.

Hypothesis one(b) considered the relationship between successful prior ties with a CRO vendor and its impact on expectation of efficacy. It was hypothesized that the more successful ties two firms had, the more likely that the sponsor would perceive the CRO as efficacious. The positive relationship described in this hypothesis was supported. Support was indicated by a t-score of 5.71 ($p<.001$). The full regression is presented in Table 11.

Hypothesis one(c) considered the relationship between successful prior ties with a CRO vendor and its impact on expectation of benevolence. It was hypothesized that the more successful ties two firms had, the more likely that the sponsor would perceive the CRO as benevolent. The positive relationship between these two constructs described in the hypothesis was supported. Support was indicated by a t-score of 5.17 ($p<.001$). The full regression is presented in Table 12.

Hypothesis one(d) considered the relationship between successful prior ties with a CRO vendor and its impact on expectation of values consistency. It was hypothesized that the more successful ties two firms had, the more likely that the sponsor would perceive the CRO as holding a consistent set of guiding values. The positive relationship described in this hypothesis was supported. Support was indicated by a t-score of 4.83 ($p<.001$). The full regression is presented in Table 13.

Hypothesis one(e) considered the relationship between successful prior ties with a CRO vendor and its impact on expectation of values compatibility. It was hypothesized

that the more successful ties two firms had, the more likely that the sponsor would perceive the CRO as holding a compatible set of guiding values. The positive relationship described in this hypothesis was supported. Support was indicated by a t-score of 4.7 ($p<.001$). The full regression is presented in Table 14.

Hypothesis 2

Hypothesis two(a) considered the relationship between positive reputation and expectations of competence. It was hypothesized that the better the CRO's reputation, the more likely that the sponsor would perceive the CRO as competent. The positive relationship described in this hypothesis was supported. Support was indicated by a t-score of 5.72 ($p<.001$). The full regression is presented in Table 10.

Hypothesis two(b) considered the relationship between positive reputation of a CRO vendor and its impact on expectation of efficacy. It was hypothesized that the better the CRO's reputation, the more likely that the sponsor would perceive the CRO as efficacious. The positive relationship hypothesized between these two constructs was supported. Support was indicated with a t-score of 3.59 ($p<.001$). The full regression is presented in Table 11.

Hypothesis two(c) considered the relationship between positive reputation of a CRO vendor and its impact on expectation of benevolence. It was hypothesized that the better the CRO's reputation, the more likely that the sponsor would perceive the CRO as benevolent. The positive relationship hypothesized between these two constructs was not supported. The t-score for this hypothesis was -.11 and was not significant at the .10 level. The full regression is presented in Table 12.

Hypothesis two(d) considered the relationship between positive reputation of a CRO vendor and its impact on expectation of values consistency. It was hypothesized that the better the CRO's reputation, the more likely that the sponsor would perceive the CRO as holding a consistent set of guiding values. The positive relationship described in this hypothesis was supported. Support was indicated by a t-score of 3.12 ($p<.01$). The full regression is presented in Table 13.

Hypothesis two(e) considered the relationship between positive reputation of a CRO vendor and its impact on expectation of values compatibility. It was hypothesized that the better the CRO's reputation, the more likely that the sponsor would perceive the CRO as holding a compatible set of guiding values. The positive relationship described in this hypothesis was not supported. The t-score for this relationship was .46 and was not significant at the .10 level. The full regression is presented in Table 14.

Hypothesis 3

Hypothesis three considered the relationship between a sponsor's expectation of a CRO's competence and the sponsor's trust in the CRO. It was hypothesized that the higher the sponsor's perception of CRO competence the higher the sponsor's trust in the CRO. The positive relationship described in this hypothesis was supported. Support was indicated by a t-score of 4.54 ($p<.001$). The full regression is presented in Table 15.

Hypothesis 4

Hypothesis four considered the relationship between a sponsor's expectation of a CRO's efficacy and the sponsor's trust in the CRO. It was hypothesized that the higher the sponsor's perception of CRO efficacy the higher the sponsor's trust in the CRO. The

positive relationship described in this hypothesis was supported. Support was indicated by a t-score of 3.36 ($p<.001$). The full regression is presented in Table 16.

Hypothesis 5

Hypothesis five considered the relationship between a sponsor's expectation of a CRO's benevolence and the sponsor's trust in the CRO. It was hypothesized that the higher the sponsor's perception of CRO benevolence the higher the sponsor's trust in the CRO. The positive relationship described between these two constructs was not supported. The t-score statistic for this relationship was 1.72 and was not significant at the .05 level of analysis. The full regression is presented in Table 17.

Hypothesis 6

Hypothesis six considered the relationship between a sponsor's expectation of a CRO's values consistency and the sponsor's trust in the CRO. It was hypothesized that the higher the sponsor's perception of CRO values consistency the higher the sponsor's trust in the CRO. The relationship described in this hypothesis was supported. Support was indicated by a t-score of 2.57 ($p<.05$). The full regression is presented in Table 18.

Hypothesis 7

Hypothesis seven considered the relationship between a sponsor's perception of a CRO's values compatibility and the sponsor's trust in the CRO. It was hypothesized that the higher the degree of sponsor perceived CRO values compatibility the higher the sponsor's trust in the CRO. The positive relationship described in this hypothesis was not supported. The t-score statistic for this relationship was -.81 and was not significant at the .10 level. The full regression is presented in Table 19.

Summary of Hypotheses

The overall results of the previously discussed hypotheses are presented in a revised version of the model discussed earlier. The results are shown on Figure 2.

Supplemental Information Using a Single Response Format

Given concerns about the ability of the technique used in the previous section to control the lack of independence in multiple responses coming from a single source, additional hypothesis tests were conducted. In these supplemental tests, a single CRO evaluation was haphazardly selected from each respondent. This technique cut the sample size from 304 usable CRO evaluations to 125 usable CRO evaluations. The same analysis conducted on 304 responses and presented in Tables 10-21 was repeated using the new sample of 125. This analysis is presented in Tables 10-21 Supplemental and Figure 5.

Since the supplemental analysis was conducted in order to check on the accuracy of the original analysis, the results of each hypothesis test is not presented here. Rather a summary of the results is discussed.

In the original hypothesis test using the 304 responses, evidence of positive and significant relationships was identified in 11 of the 15 relationships. As noted earlier, this evidence is presented in summary form in Figure 2. In the supplemental hypothesis tests using the 125 response format, 8 of the 11 positive and significant relationships identified earlier were positive and significant. Using the 125 response format, only three relationships previously identified as positive and significant were no longer significant. All three relationships were still positive, but the strength of the relationships was not significant.

In the case of H2d, the relationship between positive reputation and values

consistency went from a t score of 3.120, significant at .002, to a t score of .910 at a .364 significance level. In the case of H3, the relationship between competence and interorganizational trust went from a t score of 4.540, significant at .000, to a t score of 1.210 at a .227 significance level. Finally, in the case of H6, the relationship between values consistency and interorganizational trust went from a t score of 2.570, significant at .012, to a t score of 1.590 at a .116 significance level. The regressions for these three hypotheses are present in Table 13 - Supplemental, Table 15 – Supplemental, and Table 18 – Supplemental, respectively.

None of the nonsignificant relationships identified in the original sample of 304 became significant as a result of the sample modification. Further, none of the significant hypothesized relationships changed signs (positive to negative), as a result of the sample modification. In order to help identify outcome differences in the two samples, both the original and the supplemental regressions for each hypothesis are presented on the supplemental tables. Figure 5 identifies in summary form the significant relationships, the nonsignificant relationships, and the three relationships that were significant under the first technique but not the second.

The outcome of these results is not entirely unexpected. By dropping the sample size from 304 to 125, there was a substantial loss in statistical power. It is likely that the drop in statistical power made it difficult to identify relationships that manifest themselves using a sample size of 304.

Despite the drop in statistical power the results between the two analyses are remarkably similar. This result is also not entirely unexpected. One way of predicting this outcome would be to consider creating a dummy variable for each respondent as a

way of controlling for potential lack of independence between the responses. The inclusion of nearly 125 dummy variables over 304 CRO evaluations would not have the ability to bias the parameter estimates, a critical test of whether that data would be skewed. If, for example, only three respondents were the source for 304 CRO evaluations, then the likely hood of biased parameter estimates would be significant.

A Fully Mediated Model

The full model of interorganizational trust developed in this study is a mediating model. The data suggests that two exogenous and independent variables predict five endogenous and independent variables (mediating variables), that predict one endogenous and dependent variable. However the previous regressions have not explicitly addressed the issue of mediation. In order to test the model for mediation four steps are required (Baron & Kenny, 1986; Judd & Kenny, 1981; Kenny, 2003):

Step 1:

The first step is to show that the exogenous, independent variables are related to the dependent variable. This suggests a relationship that is not presented on the original model. In order to make this relationship clearer, refer to Figure 3.

The graphical representation in Figure 3 and the regression analysis presented in Table 20 show a relationship between successful prior ties and positive reputation and the dependent variable, interorganizational trust. This step helps to establish a baseline of a potential relationship before going forward with the other steps.

In Table 20 the results of a multiple regression are presented. It is apparent that when successful prior ties is regressed against trust, the result is a positive and significant

relationship. The respective statistic for this relationship is a t-score of 4.07 that is significant at the .001 level. It is also apparent that when positive reputation is regressed against trust, the result is a positive although somewhat less significant relationship. The respective statistic for this relationship is a t-score of 1.78 that is significant at the .1 level.

Step 2

The next step is to show that successful prior ties and positive reputation are correlated with the mediating variables (competence, efficacy, benevolence, values consistency and values compatibility). These relationships were already established in an earlier section of the hypotheses test. The outcome of these regressions can be found on Tables 10-14 and graphically on Figure 2, and are summarized here. All the relationships, except for positive reputation and benevolence and positive reputation and values compatibility were positive and significant. In light of this evidence the mediation test can proceed to the next step.

Step 3

The next step is to show that the mediating variables (competence, efficacy, benevolence, values consistency and values compatibility) are correlated with the dependent variable. These relationships were already established in an earlier section of the hypotheses test. The outcome of these regressions can be found on Tables 15-19 and graphically on Figure 2, and are summarized here. All the relationships, except for benevolence and interorganizational trust and values compatibility and interorganizational trust were positive and significant. This finding will impact the claims made about the mediating variables in the forthcoming step.

Step 4

To establish that the variables competence, efficacy, and values consistency completely mediate the relationship between successful prior ties and positive reputation, and interorganizational trust, the effects of both step 3 and step 4 are estimated in the same regression model. Notice that since values compatibility and benevolence do not have a significant relationship with interorganizational trust, they are not included as mediating variables in this description. Their inclusion in the graphical representations describing this step, Figure 4, be construed to me that they are mediating variables.

Table 21 and Figure 4 present the results of a multiple regression in which successful prior ties, positive reputation, competence, efficacy, benevolence, values consistency and values compatibility are regressed against trust. This regression confirms that the exogenous variables successful prior ties and positive reputation are perfectly mediated by the endogenous variables competence, efficacy and values consistency, in their relationship to trust. When the constructs were included in the regression, the positive and significant relationships witnessed in Table 20 are still positive but are not significant. Neither successful prior ties nor positive reputation had a large t-score or was significant. The respective statistics for these two variables are prior ties with a t - score of 1.47 that is not significant at the .1 level, and reputation with a t-score of .5 that is not significant at the .1 level. By following the steps recommended for identifying mediation, this study presents evidence showing that the direct relationship between successful prior ties and positive reputation, and trust is not significant when other more direct variables are available.

Control Variable Findings

Information on a series of control variables specific to this industry setting was gathered to help refine the analysis of sponsor trust for CROs. Dummy variables with 0/1 were established to code these variables for inclusion in the analysis. These variables and the results gathered are detailed below.

Type of Firm

Respondents were asked to provide information on the kind of firm they worked for. Three different categories were included: Pharmaceutical firm, biotechnology firm, and medical device firm. All three kinds of firms sponsor clinical trials. No medical device firms were represented in the data so this category was dropped. The findings from multiple regression run on the data with the control variables factored in suggested that pharmaceutical firms were far less likely to trust than biotechnology firms. Pharmaceutical firm responses and measure of trust were negatively correlated. The support for this negative relationship was indicated by a t-score of -3.72 (p.001). No particular relationship was noted for biotechnology firms. The full regression is presented in Table 21.

Tenure with Firm

Respondents were asked to provide information regarding their tenure with the firm. Using this information, a dummy variable was set up for new employees v. long-term employees. Any employee who had been with the firm 2 years or less was classified as a new employee. The data did not support any particular difference between these two groups. The t-score for new employees was 1.39 and was not significant at the .10 level. The full regression is presented in Table 21.

Non-Managers

Respondents were asked to provide information regarding their level of authority with the firm. As a measure of authority, people who manage others were distinguished from those who do not manage others. The finding yielded from this attribute is that non-managers are less likely to trust than managers. This finding is supported by the negative correlation between non-manager status and trust. The t-score was -2.58 (p.05). The full regression is presented in Table 21.

Preferred Vendor List

Respondents were asked to provide information regarding the existence of a preferred vendor list of CROs. This variable was dummy coded 0/1 for no and yes responses. Firms that indicated that they had a preferred vendor list were more likely to trust CROs than firms that indicated that they did not have a preferred vendor list. The t-score for those with a vendor list was 2.46 ($p<.05$). The full regression is presented in Table 21.

Conclusion

This chapter started with some basic descriptive statistics about the instrument items and worked through the steps conducted to perform an empirical test of this project's data. Included in the steps were an examination of the items' descriptive statistics, the calculation of Cronbach's alpha reliability score for the constructs and the presentation of hypotheses results using multiple regression. The implications of these findings will be discussed in the forthcoming chapter.

Table 5 – Response Rates & F Statistics for Early v. Late Variances

Response Rate Calculation

	#	%
Final ACRP Email File	1519	100.00%
Non-Responses	859	56.55%
Responses	660	43.45%
Complete Responses Used In Analysis	125	8.23%

F Statistics for Early Responders v. Late Responders

Factor	Construct	F Value
F1	Trust	1.03
F2	Competence	1.11
F3	Efficacy	1.10
F4	Benevolence	1.16
F5	Values Consistency	1.34
F6	Values Compatibility	1.01
F7	Successful Prior Ties	1.16
F8	Positive Reputation	1.44

Table 6 – Demographic Data

Type of Firm	Pharmaceutical Firm	59%
	Medical Device Firm	29%
	Bio-Technology Firm	12%
Respondents that "manage"	Yes	56%
	No	44%
Firms with preferred lists	Yes	54%
	No	46%

Table 7 – Descriptive Statistics of Instrument Items

Item	Survey	Mean	Median	Mode	Std Dev.	Var.	Range
v1	**Q32**	**3.44**	**3**	**3**	**1.87**	**3.51**	**6**
v2	*Q37*	*3.06*	*3*	*1*	*1.63*	*2.66*	*6*
v3	*	*	*	*	*	*	*
v4	**Q8**	**5.14**	**5**	**5**	**1.44**	**2.06**	**6**
v5	*	*	*	*	*	*	*
v6	*	*	*	*	*	*	*
v7	**Q1**	**4.97**	**5**	**5**	**1.42**	**2.02**	**6**
v8	**Q5**	**5.26**	**5**	**6**	**1.41**	**1.99**	**6**
v9	**Q10**	**5.43**	**6**	**5**	**1.33**	**1.76**	**6**
v10	**Q15**	**5.25**	**5**	**5**	**1.29**	**1.66**	**6**
v11	**	**	**	**	**	**	**
v12	**Q30**	**4.64**	**5**	**5**	**1.58**	**2.5**	**6**
v13	**Q6**	**4.54**	**4**	**4**	**1.73**	**2.95**	**6**
v14	*Q2*	*4.93*	*5*	*5*	*1.51*	*2.28*	*6*
v15	*Q11*	*4.66*	*5*	*5*	*1.53*	*2.32*	*6*
v16	*Q16*	*4.39*	*4*	*4*	*1.36*	*1.86*	*6*
v17	*Q25*	*2.98*	*3*	*3*	*1.57*	*2.47*	*6*
v18	**Q21**	**4.25**	**4**	**4**	**1.59**	**2.54**	**6**
v19	**Q31**	**4.82**	**5**	**5**	**1.5**	**2.24**	**6**
v20	**Q26**	**4.74**	**5**	**6**	**1.64**	**2.7**	**6**
v21	*Q35*	*2.55*	*2*	*1*	*1.53*	*2.34*	*5*
v22	**Q36**	**4.63**	**5**	**5**	**1.46**	**2.13**	**6**
v23	**Q3**	**4.57**	**5**	**5**	**1.72**	**2.96**	**6**
v24	**Q7**	**5.15**	**5**	**6**	**1.34**	**1.79**	**6**
v25	*Q13*	*5.06*	*5*	*5*	*1.34*	*1.8*	*6*
v26	**Q12**	**4.84**	**5**	**6**	**1.48**	**2.2**	**6**
v27	**Q17**	**4.95**	**5**	**5**	**1.44**	**2.07**	**6**
v28	**Q22**	**4.02**	**4**	**4**	**1.53**	**2.35**	**6**
v29	**Q27**	**4.64**	**4**	**4**	**1.4**	**1.95**	**6**
v30	*Q28*	*5.1*	*5*	*6*	*1.52*	*2.3*	*6*
v31	*Q33*	*4.14*	*4*	*4*	*1.88*	*3.52*	*6*
v32	**	**	**	**	**	**	**
v33	*Q14*	*4.75*	*5*	*5*	*1.53*	*2.34*	*6*
v34	*Q19*	*5.39*	*5*	*7*	*1.35*	*1.83*	*6*
v35	*Q24*	*5.39*	*6*	*7*	*1.77*	*3.12*	*6*
v36	*Q29*	*5.15*	*5*	*6*	*1.26*	*1.58*	*6*
v37	*	*	*	*	*	*	*

* Denotes items dropped from consideration due to low Cronbach's alpha
** Denotes items dropped due to dependence on preferred list
Italic Denote items created for this study and based on semi-structured interviews
Bold Denote items taken from previously validated instruments

Table 8 – Reliability Scores

Construct	Factor	Cronbach's α
Successful Prior Ties	F7	0.82
Positive Reputation	F8	0.62
Competence	F2	0.89
Efficacy	F3	0.88
Benevolence	F4	0.78
Values Consistency	F5	0.89
Values Compatibility	F6	0.89
Trust	F1	0.72

Note: Some of the items for the scales were taken from previously validated instruments while some were created specifically for this study. To see the source of the items and how the items were combined to measure the respective constructs refer to Table 4 and Table 7.

Table 9 – Intercorrelation Tables

Section 1

Means, Standard Deviations, Intercorrelations for Model Variables

Variable	Mean	S.D.	1	2	3	4	5	6	7	8
Trust	3.95	1.37								
Competence	5.22	1.19	.68							
Efficacy	4.38	1.21	.67	.78						
Benevolence	4.14	1.28	.64	.63	.70					
Consistency	4.86	1.25	.71	.80	.81	.70				
Compatibility	4.62	1.24	.65	.69	.71	.81	.78			
Prior Ties	4.71	1.39	.65	.74	.75	.67	.75	.68		
Reputation	4.74	1.12	.61	.74	.61	.55	.65	.61	.65	

Section 2

Means, Standard Deviations, Intercorrelations Estimates for Model Variables ***Using Within Respondent Standardized Scores***

Variable	Mean	S.D.	1	2	3	4	5	6	7	8
Trust	3.57	0.66								
Competence	4.43	0.51	.34							
Efficacy	3.85	0.53	.32	.50						
Benevolence	3.70	0.63	.27	.29	.43					
Consistency	4.17	0.51	.35	.47	.48	.40				
Compatibility	4.03	0.53	.20	.21	.29	.58	.45			
Prior Ties	4.10	0.69	.28	.46	.49	.37	.42	.33		
Reputation	4.48	0.57	.19	.45	..33	.12	.31	.11	.30	

Table 10 – H1a & H2a

Number of obs = 297

		F(8, 121)	16.23
		Prob > F	0
		R-squared	0.3419
Number of clusters (respid)	122	Root MSE	0.41209

comp

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.012918	0.096964	0.130	0.894	-0.179048	0.204884
pharma	-0.152366	0.070177	-2.170	0.032	-0.291300	-0.013433
newguy	0.014028	0.061318	0.230	0.819	-0.107367	0.135424
non_mngr	-0.119558	0.063658	-1.880	0.063	-0.245585	0.006470
outsource	-0.218998	0.096898	-2.260	0.026	-0.410833	-0.027163
pref_list	0.016645	0.063360	0.260	0.793	-0.108793	0.142083
pties	0.265923	0.046697	**5.690**	**0.000**	0.173474	0.358372
reput	0.304999	0.053294	**5.720**	**0.000**	0.199490	0.410508
_cons	2.124665	0.258219	8.230	0.000	1.613452	2.635878

Table 11 – H1b & H2b

Number of obs = 297

		F(8, 121)	10.11
		Prob > F	0
		R-squared	0.2939
Number of clusters (respid)	122	Root MSE	0.44668

eff

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.160888	0.122169	-1.320	0.190	-0.402754	0.080978
pharma	-0.096299	0.085019	-1.130	0.260	-0.264615	0.072018
newguy	-0.050149	0.071998	-0.700	0.487	-0.192687	0.092390
non_mngr	0.080667	0.072214	1.120	0.266	-0.062300	0.223635
outsource	-0.241723	0.158836	-1.520	0.131	-0.556180	0.072733
pref_list	-0.036733	0.061925	-0.590	0.554	-0.159330	0.085864
pties	0.318907	0.055815	**5.710**	**0.000**	0.208407	0.429407
reput	0.193837	0.054022	**3.590**	**0.000**	0.086886	0.300789
_cons	1.775178	0.271419	6.540	0.000	1.237831	2.312524

Table 12 – H1c & H2c

Number of obs = 297

		F(8, 121)	3.82
		Prob > F	0.0005
		R-squared	0.155
Number of clusters (respid)	122	Root MSE	0.58443

bene

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.106301	0.121823	-0.870	0.385	-0.347481	0.134880
pharma	-0.073430	0.117267	-0.630	0.532	-0.305591	0.158731
newguy	0.092811	0.099102	0.940	0.351	-0.103388	0.289011
non_mngr	-0.094517	0.095964	-0.980	0.327	-0.284502	0.095468
outsource	-0.206424	0.156509	-1.320	0.190	-0.516274	0.103427
pref_list	-0.047119	0.090737	-0.520	0.605	-0.226757	0.132519
pties	0.352984	0.068270	**5.170**	**0.000**	0.217825	0.488143
reput	-0.009282	0.082217	-0.110	0.910	-0.172052	0.153488
_cons	2.390950	0.397989	6.010	0.000	1.603026	3.178874

Table 13 – H1d & H2d

Number of obs = 297

		F(8, 121)	9.19
		Prob > F	0
		R-squared	0.2284
Number of clusters (respid)	122	Root MSE	0.4475

consist

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.209707	0.102756	**-2.040**	**0.043**	-0.413139	-0.006276
pharma	-0.144131	0.078113	-1.850	0.067	-0.298777	0.010515
newguy	0.017117	0.072966	0.230	0.815	-0.127344	0.161567
non_mngr	0.020269	0.076390	0.270	0.791	-0.130965	0.171504
outsource	-0.044147	0.102795	-0.430	0.668	-0.247656	0.159363
pref_list	-0.032113	0.072897	-0.440	0.660	-0.176432	0.112205
pties	0.262470	0.054345	**4.830**	**0.000**	0.154879	0.370060
reput	0.183039	0.058732	**3.120**	**0.002**	0.066763	0.299314
_cons	2.410690	0.278133	8.670	0.000	1.860052	2.961328

Table 14 – H1e & H2e

Number of obs = 297

		F(8, 121)	4.26
		Prob > F	0.0002
		R-squared	0.143
Number of clusters (respid)	122	Root MSE	0.4941

compat

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.183415	0.119023	-1.540	0.126	-0.419053	0.052222
pharma	-0.250380	0.078184	**-3.200**	**0.002**	-0.405166	-0.095595
newguy	0.035562	0.093198	0.380	0.703	-0.148948	0.220073
non_mngr	0.017942	0.080447	0.220	0.824	-0.141325	0.177208
outsource	-0.046075	0.143307	-0.320	0.748	-0.329789	0.237638
pref_list	0.094939	0.081295	1.170	0.245	-0.066007	0.255885
pties	0.255080	0.054223	**4.700**	**0.000**	0.147731	0.362429
reput	0.033125	0.072149	0.460	0.647	-0.109714	0.175964
_cons	2.941367	0.357688	8.220	0.000	2.233230	3.649504

Table 15 – H3

Number of obs = 304

		F(7, 124)	6.77
		Prob > F	0
		R-squared	0.2113
Number of clusters (respid)	125	Root MSE	0.59707

trust

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.016511	0.147280	-0.110	0.911	-0.308020	0.274998
pharma	-0.338105	0.100452	**-3.370**	**0.001**	-0.536927	-0.139283
newguy	0.145740	0.099218	1.470	0.144	-0.050641	0.342120
non_mngr	-0.225359	0.100702	-2.240	**0.027**	-0.424676	-0.026043
outsource	0.231538	0.201714	1.150	0.253	-0.167711	0.630787
pref_list	0.221530	0.103998	**2.130**	**0.035**	0.015690	0.427371
comp	0.429606	0.094671	**4.540**	**0.000**	0.242227	0.616985
_cons	1.805273	0.438709	4.110	0.000	0.936946	2.673600

Table 16 – H4

Number of obs = 304

		F(8, 124)	9.56
		Prob > F	0
		R-squared	0.2646
Number of clusters (respid)	125	Root MSE	0.57753

trust

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.039797	0.142481	0.280	0.780	-0.242213	0.321806
pharma	-0.349952	0.107240	-3.260	0.001	-0.562210	-0.137694
newguy	0.168371	0.098639	1.710	0.090	-0.026863	0.363604
non_mngr	-0.274864	0.104114	-2.640	0.009	-0.480934	-0.068794
outsource	0.266584	0.213284	1.250	0.214	-0.155565	0.688732
pref_list	0.246536	0.103345	2.390	0.019	0.041988	0.451084
comp	0.245651	0.112260	2.190	0.031	0.023458	0.467845
eff	0.340391	0.101406	**3.360**	**0.001**	0.139681	0.541102
_cons	1.306692	0.424784	3.080	0.003	0.465925	2.147459

Table 17 – H5

Number of obs = 304

		F(9, 124)	9.37
		Prob > F	0
		R-squared	0.2803
Number of clusters (respid)	125	Root MSE	0.57231

trust

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.0401321	0.1478508	0.27	0.787	-0.2525061	0.3327703
pharma	-0.352001	0.1048818	-3.36	0.001	-0.5595919	-0.144411
newguy	0.1535882	0.1016265	1.51	0.133	-0.0475591	0.3547354
non_mngr	-0.261202	0.1075703	-2.43	0.017	-0.4741136	-0.04829
outsource	0.281024	0.2360239	1.19	0.236	-0.1861334	0.7481813
pref_list	0.2505806	0.1035594	2.42	0.017	0.0456076	0.4555537
comp	0.2301401	0.1073477	2.14	0.034	0.0176689	0.4426112
eff	0.2716697	0.1057552	2.57	0.011	0.0623506	0.4809888
bene	0.1480811	0.0860562	**1.72**	**0.088**	-0.0222482	0.3184105
_cons	1.090451	0.4315205	2.53	0.013	0.2363511	1.944551

Table 18 – H6

Number of obs = 304

		F(10, 124)	12.29
		Prob > F	0
		R-squared	0.3057
Number of clusters (respid)	125	Root MSE	0.56305

trust

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.078888	0.142657	0.550	0.581	-0.203471	0.361247
pharma	-0.339430	0.103601	-3.280	0.001	-0.544485	-0.134375
newguy	0.152019	0.102571	1.480	0.141	-0.050998	0.355035
non_mngr	-0.280322	0.110913	-2.530	0.013	-0.499849	-0.060795
outsource	0.253332	0.231190	1.100	0.275	-0.204257	0.710922
pref_list	0.255670	0.105217	2.430	0.017	0.047416	0.463924
comp	0.149944	0.116834	1.280	0.202	-0.081303	0.381191
eff	0.217107	0.109518	1.980	0.050	0.000341	0.433873
bene	0.102475	0.085934	1.190	0.235	-0.067612	0.272562
consist	0.260125	0.101405	**2.570**	**0.012**	0.059415	0.460835
_cons	0.730958	0.383011	1.910	0.059	-0.027128	1.489044

Table 19 – H7

Number of obs = 304

		F(11, 124)	10.98
		Prob > F	0
		R-squared	0.3083
Number of clusters (respid)	125	Root MSE	0.56297

trust

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.074080	0.140449	0.530	0.599	-0.203907	0.352067
pharma	-0.352726	0.102860	-3.430	0.001	-0.556314	-0.149138
newguy	0.152883	0.101725	1.500	0.135	-0.048459	0.354224
non_mngr	-0.275728	0.111564	-2.470	0.015	-0.496544	-0.054912
outsource	0.255317	0.225455	1.130	0.260	-0.190922	0.701556
pref_list	0.265285	0.104361	2.540	0.012	0.058725	0.471844
comp	0.145829	0.116937	1.250	0.215	-0.085622	0.377279
eff	0.214746	0.108259	1.980	0.050	0.000471	0.429022
bene	0.137875	0.099827	1.380	0.170	-0.059709	0.335460
consist	0.284427	0.098792	2.880	0.005	0.088891	0.479964
compat	-0.082772	0.102587	**-0.810**	**0.421**	-0.285819	0.120276
_cons	0.860950	0.392268	2.190	0.030	0.084542	1.637358

Table 20 – Mediation Step 1

Number of obs = 297

		F(8, 121)	5.91
		Prob > F	0
		R-squared	0.2293
Number of clusters (respid)	122	Root MSE	0.59529

trust

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.042492	0.158835	-0.270	0.790	-0.356949	0.271964
pharma	-0.464191	0.114783	-4.040	0.000	-0.691433	-0.236948
newguy	0.149311	0.100011	1.490	0.138	-0.048688	0.347310
non_mngr	-0.300189	0.106161	-2.830	0.005	-0.510363	-0.090015
outsource	0.138285	0.252406	0.550	0.585	-0.361420	0.637989
pref_list	0.234987	0.108886	2.160	0.033	0.019418	0.450555
pties	0.283348	0.069543	**4.070**	**0.000**	0.145669	0.421027
reput	0.152489	0.085571	**1.780**	**0.077**	-0.016923	0.321900
_cons	1.975867	0.410023	4.820	0.000	1.164117	2.787616

Table 21 – Mediation Step 4 & Control Variables

Number of obs = 297

		F(13, 121)	9.05
		Prob > F	0
		R-squared	0.3187
Number of clusters (respid)	122	Root MSE	0.56462

trust

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.034567	0.146153	0.240	0.813	-0.254782	0.323915
pharma	-0.412256	0.110922	-3.720	0.000	-0.631855	-0.192657
newguy	0.143995	0.103818	1.390	0.168	-0.061541	0.349531
non_mngr	-0.294058	0.114036	-2.580	0.011	-0.519823	-0.068294
outsource	0.237905	0.242577	0.980	0.329	-0.242341	0.718150
pref_list	0.265407	0.107889	2.460	0.015	0.051813	0.479000
pties	0.111448	0.075133	1.480	0.141	-0.037299	0.260194
reput	0.045399	0.091617	0.500	0.621	-0.135982	0.226780
comp	0.094673	0.124318	0.760	0.448	-0.151448	0.340794
eff	0.183404	0.115820	1.580	0.116	-0.045893	0.412701
bene	0.136432	0.098013	1.390	0.166	-0.057610	0.330475
consist	0.259987	0.100554	2.590	0.011	0.060913	0.459060
compat	-0.110401	0.106820	-1.030	0.303	-0.321879	0.101077
_cons	0.820924	0.421003	1.950	0.053	-0.012562	1.654409

Table 10 Supplemental – H1a & H2a Single Response per Firm Format

Number of obs = 297

F(8, 121) 16.23
Prob > F 0
R-squared 0.3419
Number of clusters (respid) 122 Root MSE 0.41209

comp

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.012918	0.096964	0.130	0.894	-0.179048	0.204884
pharma	-0.152366	0.070177	-2.170	0.032	-0.291300	-0.013433
newguy	0.014028	0.061318	0.230	0.819	-0.107367	0.135424
non_mngr	-0.119558	0.063658	-1.880	0.063	-0.245585	0.006470
outsource	-0.218998	0.096898	-2.260	0.026	-0.410833	-0.027163
pref_list	0.016645	0.063360	0.260	0.793	-0.108793	0.142083
pties	0.265923	0.046697	**5.690**	**0.000**	0.173474	0.358372
reput	0.304999	0.053294	**5.720**	**0.000**	0.199490	0.410508
_cons	2.124665	0.258219	8.230	0.000	1.613452	2.635878

125 Randomly Selected From Each Firm

Source	SS	df	MS
Model	5.164861	8	0.6456076
Residual	15.845064	112	0.1414738
Total	21.009924	120	0.1750827

Number of obs = 121
Prob > F 0.0001
R-squared 0.2458
Adj R-squar 0.1920
Root MSE 0.3761

comp

Variables	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.143665	0.121197	-1.190	0.238	-0.383802	0.096472
pharma	-0.239260	0.080666	-2.970	0.004	-0.399088	-0.079431
newguy	0.040731	0.077536	0.530	0.600	-0.112896	0.194358
non_mngr	-0.172997	0.071136	-2.430	0.017	-0.313943	-0.032050
outsource	-0.156154	0.180698	-0.860	0.389	-0.514184	0.201876
pref_list	-0.102758	0.071522	-1.440	0.154	-0.244470	0.038954
pties	0.145751	0.054711	**2.660**	**0.009**	0.037347	0.254154
reput	0.187343	0.063349	**2.960**	**0.004**	0.061825	0.312860
_cons	3.300503	0.355890	9.270	0.000	2.595352	4.005653

Table 11 Supplemental – H1b & H2b Single Response per Firm Format

Number of obs = 297

		F(8, 121)	10.11
		Prob > F	0
		R-squared	0.2939
Number of clusters (respid)	122	Root MSE	0.44668

eff

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.160888	0.122169	-1.320	0.190	-0.402754	0.080978
pharma	-0.096299	0.085019	-1.130	0.260	-0.264615	0.072018
newguy	-0.050149	0.071998	-0.700	0.487	-0.192687	0.092390
non_mngr	0.080667	0.072214	1.120	0.266	-0.062300	0.223635
outsource	-0.241723	0.158836	-1.520	0.131	-0.556180	0.072733
pref_list	-0.036733	0.061925	-0.590	0.554	-0.159330	0.085864
pties	0.318907	0.055815	**5.710**	**0.000**	0.208407	0.429407
reput	0.193837	0.054022	**3.590**	**0.000**	0.086886	0.300789
_cons	1.775178	0.271419	6.540	0.000	1.237831	2.312524

125 Randomly Selected From Each Firm

Source	SS	df	MS
Model	5.789184	8	0.723648
Residual	25.882806	112	0.231096
Total	31.671991	120	0.263933

		F(8, 112)	3.13
		Prob > F	0.0031
Number of obs =	121	R-squared	0.1828
		Adj R-squar	0.1244
eff		Root MSE	0.48072

Variables	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.112881	0.154900	-0.730	0.468	-0.419796	0.194034
pharma	-0.135468	0.103097	-1.310	0.192	-0.339742	0.068806
newguy	0.062846	0.099097	0.630	0.527	-0.133501	0.259194
non_mngr	0.026333	0.090917	0.290	0.773	-0.153808	0.206474
outsource	-0.280310	0.230947	-1.210	0.227	-0.737902	0.177281
pref_list	-0.156899	0.091411	-1.720	0.089	-0.338019	0.024220
pties	0.247337	0.069926	**3.540**	**0.001**	0.108789	0.385886
reput	0.160603	0.080965	**1.980**	**0.050**	0.000181	0.321024
_cons	2.308722	0.454857	5.080	0.000	1.407481	3.209962

Table 12 Supplemental – H1c & H2c Single Response per Firm Format

Number of obs = 297

		F(8, 121)	3.82
		Prob > F	0.0005
		R-squared	0.155
Number of clusters (respid)	122	Root MSE	0.58443

bene

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.106301	0.121823	-0.870	0.385	-0.347481	0.134880
pharma	-0.073430	0.117267	-0.630	0.532	-0.305591	0.158731
newguy	0.092811	0.099102	0.940	0.351	-0.103388	0.289011
non_mngr	-0.094517	0.095964	-0.980	0.327	-0.284502	0.095468
outsource	-0.206424	0.156509	-1.320	0.190	-0.516274	0.103427
pref_list	-0.047119	0.090737	-0.520	0.605	-0.226757	0.132519
pties	0.352984	0.068270	**5.170**	**0.000**	0.217825	0.488143
reput	-0.009282	0.082217	-0.110	0.910	-0.172052	0.153488
_cons	2.390950	0.397989	6.010	0.000	1.603026	3.178874

Source	SS	df	MS
Model	4.3440319	8	0.543003993
Residual	34.040695	112	0.303934779
Total	38.384727	120	0.319872727

		F(8, 112)	1.79
Number of obs =	121	Prob > F	0.087
		R-squared	0.1132
bene		Adj R-squar	0.0498
		Root MSE	0.5513

Variables	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.009347	0.177642	0.050	0.958	-0.342627	0.361322
pharma	-0.153331	0.118233	-1.300	0.197	-0.387595	0.080933
newguy	0.140370	0.113646	1.240	0.219	-0.084805	0.365544
non_mngr	-0.120341	0.104265	-1.150	0.251	-0.326930	0.086248
outsource	-0.205064	0.264853	-0.770	0.440	-0.729837	0.319709
pref_list	-0.141079	0.104832	-1.350	0.181	-0.348790	0.066632
pties	0.221149	0.080192	**2.760**	**0.007**	0.062259	0.380039
reput	-0.021410	0.092852	-0.230	0.818	-0.205384	0.162564
_cons	3.136505	0.521637	6.010	0.000	2.102948	4.170061

Table 13 Supplemental – H1d & H2d Single Response per Firm Format

Number of obs = 297

F(8, 121)	9.19
Prob > F	0
R-squared	0.2284
Root MSE	0.4475

Number of clusters (respid) 122

consist

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.209707	0.102756	-2.040	0.043	-0.413139	-0.006276
pharma	-0.144131	0.078113	-1.850	0.067	-0.298777	0.010515
newguy	0.017117	0.072966	0.230	0.815	-0.127344	0.161567
non_mngr	0.020269	0.076390	0.270	0.791	-0.130965	0.171504
outsource	-0.044147	0.102795	-0.430	0.668	-0.247656	0.159363
pref_list	-0.032113	0.072897	-0.440	0.660	-0.176432	0.112205
pties	0.262470	0.054345	**4.830**	**0.000**	0.154879	0.370060
reput	0.183039	0.058732	**3.120**	**0.002**	0.066763	0.299314
_cons	2.410690	0.278133	8.670	0.000	1.860052	2.961328

125 Randomly Selected From Each Firm

Source	SS	df	MS
Model	3.76364922	8	0.470456
Residual	22.6445791	112	0.202184
Total	26.4082283	120	0.220069

Number of obs = 121

F(8, 112)	2.33
Prob > F	0.0238
R-squared	0.1425
Adj R-square	0.0813
Root MSE	0.44965

consist

Variables	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.276219	0.144887	-1.910	0.059	-0.563293	0.010856
pharma	-0.239421	0.096433	-2.480	0.015	-0.430490	-0.048353
newguy	0.038053	0.092691	0.410	0.682	-0.145601	0.221708
non_mngr	-0.008053	0.085040	-0.090	0.925	-0.176549	0.160443
outsource	0.041074	0.216017	0.190	0.850	-0.386936	0.469085
pref_list	-0.076881	0.085502	-0.900	0.370	-0.246292	0.092530
pties	0.197020	0.065405	**3.010**	**0.003**	0.067428	0.326612
reput	0.068982	0.075731	*0.910*	*0.364*	-0.081069	0.219033
_cons	3.295056	0.425453	7.740	0.000	2.452076	4.138036

Table 14 Supplemental – H1e & H2e Single Response per Firm Format

Number of obs = 297

F(8, 121)	4.26
Prob > F	0.0002
R-squared	0.143
Root MSE	0.4941

Number of clusters (respid) 122

compat

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.183415	0.119023	-1.540	0.126	-0.419053	0.052222
pharma	-0.250380	0.078184	-3.200	0.002	-0.405166	-0.095595
newguy	0.035562	0.093198	0.380	0.703	-0.148948	0.220073
non_mngr	0.017942	0.080447	0.220	0.824	-0.141325	0.177208
outsource	-0.046075	0.143307	-0.320	0.748	-0.329789	0.237638
pref_list	0.094939	0.081295	1.170	0.245	-0.066007	0.255885
pties	0.255080	0.054223	**4.700**	**0.000**	0.147731	0.362429
reput	0.033125	0.072149	0.460	0.647	-0.109714	0.175964
_cons	2.941367	0.357688	8.220	0.000	2.233230	3.649504

125 Randomly Selected From Each Firm

Source	SS	df	MS
Model	4.48706346	8	0.560882932
Residual	25.4426767	112	0.227166756
Total	29.9297402	120	0.249414502

Number of obs = 121

F(8, 112)	2.47
Prob > F	0.0167
R-squared	0.1499
Adj R-squar	0.0892
Root MSE	0.47662

compat

Variables	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.026008	0.153578	-0.170	0.866	-0.330302	0.278287
pharma	-0.310588	0.102217	-3.040	0.003	-0.513118	-0.108058
newguy	0.042349	0.098251	0.430	0.667	-0.152322	0.237020
non_mngr	0.007992	0.090141	0.090	0.930	-0.170611	0.186595
outsource	-0.043122	0.228975	-0.190	0.851	-0.496806	0.410562
pref_list	0.010302	0.090631	0.110	0.910	-0.169271	0.189875
pties	0.200517	0.069329	**2.890**	**0.005**	0.063151	0.337883
reput	0.088150	0.080274	1.100	0.275	-0.070901	0.247202
_cons	3.061798	0.450973	6.790	0.000	2.168253	3.955343

Table 15 Supplemental – H2 Single Response per Firm Format

Number of obs = 304

F(7, 124)	6.77
Prob > F	0
R-squared	0.2113
Root MSE	0.59707

Number of clusters (respid) 125

trust

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.016511	0.147280	-0.110	0.911	-0.308020	0.274998
pharma	-0.338105	0.100452	-3.370	0.001	-0.536927	-0.139283
newguy	0.145740	0.099218	1.470	0.144	-0.050641	0.342120
non_mngr	-0.225359	0.100702	-2.240	0.027	-0.424676	-0.026043
outsource	0.231538	0.201714	1.150	0.253	-0.167711	0.630787
pref_list	0.221530	0.103998	2.130	0.035	0.015690	0.427371
comp	0.429606	0.094671	**4.540**	**0.000**	0.242227	0.616985
_cons	1.805273	0.438709	4.110	0.000	0.936946	2.673600

125 Randomly Selected From Each Firm

Source	SS	df	MS
Model	11.8407694	8	1.48009617
Residual	41.7779532	115	0.363286549
Total	53.6187225	123	0.435924573

Number of obs = 124

F(8, 115)	4.07
Prob > F	0.0003
R-squared	0.2208
Adj R-squar	0.1666
Root MSE	0.60273

trust

Variables	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.046499	0.194135	-0.240	0.811	-0.431043	0.338044
pharma	-0.447462	0.131501	-3.400	0.001	-0.707940	-0.186983
newguy	0.211595	0.120832	1.750	0.083	-0.027750	0.450940
non_mngr	-0.225233	0.114834	-1.960	0.052	-0.452696	0.002231
outsource	0.148290	0.289728	0.510	0.610	-0.425605	0.722185
pref_list	0.182016	0.113838	1.600	0.113	-0.043475	0.407507
comp	0.168904	0.139090	*1.210*	*0.227*	-0.106605	0.444414
_cons	2.145316	0.670519	3.200	0.002	0.817147	3.473485

Table 16 Supplemental – H3 Single Response per Firm Format

Number of obs = 304

F(8, 124)	9.56
Prob > F	0
R-squared	0.2646
Root MSE	0.57753

Number of clusters (respid) 125

trust

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.039797	0.142481	0.280	0.780	-0.242213	0.321806
pharma	-0.349952	0.107240	-3.260	0.001	-0.562210	-0.137694
newguy	0.168371	0.098639	1.710	0.090	-0.026863	0.363604
non_mngr	-0.274864	0.104114	-2.640	0.009	-0.480934	-0.068794
outsource	0.266584	0.213284	1.250	0.214	-0.155565	0.688732
pref_list	0.246536	0.103345	2.390	0.019	0.041988	0.451084
comp	0.245651	0.112260	2.190	0.031	0.023458	0.467845
eff	0.340391	0.101406	**3.360**	**0.001**	0.139681	0.541102
_cons	1.306692	0.424784	3.080	0.003	0.465925	2.147459

125 Randomly Selected From Each Firm

Source	SS	df	MS
Model	14.6622764	9	1.62914182
Residual	38.9564461	114	0.341723212
Total	53.6187225	123	0.435924573

Number of obs = 124

F(9, 114)	4.77
Prob > F	0
R-squared	0.2735
Adj R-squar	0.2161
Root MSE	0.58457

trust

Variables	Coef.	Std. Err.	t	P>t	P>t	[95% Interval]
biotech	-0.023366	0.188457	-0.120	0.902	-0.396697	0.349966
pharma	-0.431972	0.127653	-3.380	0.001	-0.684851	-0.179094
newguy	0.197941	0.117287	1.690	0.094	-0.034404	0.430286
non_mngr	-0.248002	0.111655	-2.220	0.028	-0.469190	-0.026814
outsource	0.214053	0.281928	0.760	0.449	-0.344444	0.772551
pref_list	0.227368	0.111530	2.040	0.044	0.006427	0.448308
comp	0.029928	0.143307	0.210	0.835	-0.253962	0.313818
eff	0.335578	0.116786	**2.870**	**0.005**	0.104226	0.566930
_cons	1.715973	0.667259	2.570	0.011	0.394137	3.037808

Table 17 Supplemental – H4 Single Response per Firm Format

Number of obs = 304

F(9, 124)	9.37
Prob > F	0
R-squared	0.2803
Root MSE	0.57231

Number of clusters (respid) 125

trust

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.040132	0.147851	0.270	0.787	-0.252506	0.332770
pharma	-0.352001	0.104882	-3.360	0.001	-0.559592	-0.144411
newguy	0.153588	0.101627	1.510	0.133	-0.047559	0.354735
non_mngr	-0.261202	0.107570	-2.430	0.017	-0.474114	-0.048290
outsource	0.281024	0.236024	1.190	0.236	-0.186133	0.748181
pref_list	0.250581	0.103559	2.420	0.017	0.045608	0.455554
comp	0.230140	0.107348	2.140	0.034	0.017669	0.442611
eff	0.271670	0.105755	2.570	0.011	0.062351	0.480989
bene	0.148081	0.086056	1.720	0.088	-0.022248	0.318411
_cons	1.090451	0.431521	2.530	0.013	0.236351	1.944551

125 Randomly Selected From Each Firm

Source	SS	df	MS
Model	15.1848237	10	1.518482
Residual	38.4338989	113	0.340123
Total	53.6187225	123	0.435925

Number of obs = 124

F(10, 113)	4.46
Prob > F	0
R-squared	0.2832
Adj R-squar	0.2198
Root MSE	0.5832

trust

Variables	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.026841	0.188036	-0.140	0.887	-0.399374	0.345693
pharma	-0.413247	0.128246	-3.220	0.002	-0.667326	-0.159168
newguy	0.183925	0.117558	1.560	0.120	-0.048978	0.416827
non_mngr	-0.229607	0.112378	-2.040	0.043	-0.452247	-0.006966
outsource	0.231765	0.281630	0.820	0.412	-0.326195	0.789725
pref_list	0.241607	0.111860	2.160	0.033	0.019992	0.463222
comp	0.041888	0.143296	0.290	0.771	-0.242008	0.325783
eff	0.300682	0.119865	2.510	0.014	0.063207	0.538157
bene	0.126635	0.102166	1.240	0.218	-0.075775	0.329045
_cons	1.385351	0.717147	1.930	0.056	-0.035447	2.806148

Table 18 Supplemental – H5 Single Response per Firm Format

Number of obs = 304

F(10, 124) 12.29
Prob > F 0
R-squared 0.3057
Number of clusters (respid) 125 Root MSE 0.56305

trust

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.078888	0.142657	0.550	0.581	-0.203471	0.361247
pharma	-0.339430	0.103601	-3.280	0.001	-0.544485	-0.134375
newguy	0.152019	0.102571	1.480	0.141	-0.050998	0.355035
non_mngr	-0.280322	0.110913	-2.530	0.013	-0.499849	-0.060795
outsource	0.253332	0.231190	1.100	0.275	-0.204257	0.710922
pref_list	0.255670	0.105217	2.430	0.017	0.047416	0.463924
comp	0.149944	0.116834	1.280	0.202	-0.081303	0.381191
eff	0.217107	0.109518	1.980	0.050	0.000341	0.433873
bene	0.102475	0.085934	1.190	0.235	-0.067612	0.272562
consist	0.260125	0.101405	**2.570**	**0.012**	0.059415	0.460835
_cons	0.730958	0.383011	1.910	0.059	-0.027128	1.489044

Source	SS	df	MS
Model	16.0281072	11	1.45710066
Residual	37.5906153	112	0.335630494
Total	53.6187225	123	0.435924573

125 Randomly Selected From Each Firm

Number of obs = 124 F(11, 112) 4.34
Prob > F 0
trust R-squared 0.2989
Adj R-squar 0.2301
Root MSE 0.57934

Variables	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.020126	0.189126	0.110	0.915	-0.354602	0.394854
pharma	-0.384244	0.128704	-2.990	0.003	-0.639254	-0.129234
newguy	0.184304	0.116779	1.580	0.117	-0.047078	0.415687
non_mngr	-0.242818	0.111944	-2.170	0.032	-0.464620	-0.021016
outsource	0.201280	0.280424	0.720	0.474	-0.354344	0.756905
pref_list	0.238253	0.111139	2.140	0.034	0.018045	0.458461
comp	0.000812	0.144686	0.010	0.996	-0.285865	0.287489
eff	0.266640	0.120993	2.200	0.030	0.026908	0.506371
bene	0.088561	0.104293	0.850	0.398	-0.118082	0.295204
consist	0.206610	0.130345	*1.590*	*0.116*	-0.051652	0.464871
_cons	1.035741	0.745757	1.390	0.168	-0.441881	2.513363

Table 19 Supplemental – H6 Single Response per Firm Format

Number of obs = 304

F(11, 124) 10.98
Prob > F 0
R-squared 0.3083
Root MSE .56297

Number of clusters (respid) 125

trust

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.074080	0.140449	0.530	0.599	-0.203907	0.352067
pharma	-0.352726	0.102860	-3.430	0.001	-0.556314	-0.149138
newguy	0.152883	0.101725	1.500	0.135	-0.048459	0.354224
non_mngr	-0.275728	0.111564	-2.470	0.015	-0.496544	-0.054912
outsource	0.255317	0.225455	1.130	0.260	-0.190922	0.701556
pref_list	0.265285	0.104361	2.540	0.012	0.058725	0.471844
comp	0.145829	0.116937	1.250	0.215	-0.085622	0.377279
eff	0.214746	0.108259	1.980	0.050	0.000471	0.429022
bene	0.137875	0.099827	1.380	0.170	-0.059709	0.335460
consist	0.284427	0.098792	2.880	0.005	0.088891	0.479964
compat	-0.082772	0.102587	-0.810	0.421	-0.285819	0.120276
_cons	0.860950	0.392268	2.190	0.030	0.084542	1.637358

Source	SS	df	MS
Model	16.4548798	12	1.37123998
Residual	37.1638428	111	0.334809394
Total	53.6187225	123	0.435924573

125 Randomly Selected From Each Firm

Number of obs = 124

F(12, 111) 4.1
Prob > F 0
R-squared 0.3069
Adj R-squared 0.232
Root MSE 0.57863

trust

Variables	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.021611	0.188899	0.110	0.909	-0.352705	0.395926
pharma	-0.415572	0.131507	-3.160	0.002	-0.676162	-0.154982
newguy	0.187801	0.116677	1.610	0.110	-0.043402	0.419004
non_mngr	-0.238241	0.111880	-2.130	0.035	-0.459939	-0.016543
outsource	0.199726	0.280084	0.710	0.477	-0.355279	0.754732
pref_list	0.246390	0.111237	2.220	0.029	0.025967	0.466813
comp	-0.009897	0.144820	-0.070	0.946	-0.296867	0.277074
eff	0.256107	0.121204	2.110	0.037	0.015933	0.496281
bene	0.137997	0.112994	1.220	0.225	-0.085909	0.361903
consist	0.236984	0.132936	1.780	0.077	-0.026438	0.500407
compat	-0.145360	0.128750	-1.130	0.261	-0.400486	0.109766
_cons	1.350291	0.795245	1.700	0.092	-0.225539	2.926122

Table 20 Supplemental – H7 Single Response per Firm Format

Number of obs = 297

F(8, 121)	5.91
Prob > F	0
R-squared	0.2293
Root MSE	0.59529

Number of clusters (respid) 122

trust

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.042492	0.158835	-0.270	0.790	-0.356949	0.271964
pharma	-0.464191	0.114783	-4.040	0.000	-0.691433	-0.236948
newguy	0.149311	0.100011	1.490	0.138	-0.048688	0.347310
non_mngr	-0.300189	0.106161	-2.830	0.005	-0.510363	-0.090015
outsource	0.138285	0.252406	0.550	0.585	-0.361420	0.637989
pref_list	0.234987	0.108886	2.160	0.033	0.019418	0.450555
pties	0.283348	0.069543	**4.070**	**0.000**	0.145669	0.421027
reput	0.152489	0.085571	**1.780**	**0.077**	-0.016923	0.321900
_cons	1.975867	0.410023	4.820	0.000	1.164117	2.787616

125 Randomly Selected From Each Firm

Source	SS	df	MS
Model	11.5631647	8	1.44539559
Residual	41.3680332	112	0.36935744
Total	52.9311979	120	0.441093316

Number of obs = 121

F(8, 112)	3.91
Prob > F	0.0004
R-squared	0.2185
Adj R-squar	0.1626
Root MSE	0.60775

trust

Variables	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.103959	0.195830	-0.530	0.597	-0.491971	0.284052
pharma	-0.512179	0.130339	-3.930	0.000	-0.770428	-0.253929
newguy	0.211835	0.125281	1.690	0.094	-0.036394	0.460064
non_mngr	-0.280669	0.114941	-2.440	0.016	-0.508410	-0.052929
outsource	0.126490	0.291970	0.430	0.666	-0.452012	0.704992
pref_list	0.141209	0.115565	1.220	0.224	-0.087769	0.370186
pties	0.253128	0.088402	**2.860**	**0.005**	0.077970	0.428286
reput	-0.010304	0.102358	*-0.100*	*0.920*	-0.213113	0.192506
_cons	2.905991	0.575045	5.050	0.000	1.766614	4.045368

Table 21 Supplemental – H8 Single Response per Firm Format

Number of obs = 297
F(13, 121) = 9.05
Prob > F = 0
Number of clusters (respid) = 122
R-squared = 0.3187
trust
Root MSE = 0.56462

Variables	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	0.034567	0.146153	0.240	0.813	-0.254782	0.323915
pharma	-0.412256	0.110922	-3.720	0.000	-0.631855	-0.192657
newguy	0.143995	0.103818	1.390	0.168	-0.061541	0.349531
non_mngr	-0.294058	0.114036	-2.580	0.011	-0.519823	-0.068294
outsource	0.237905	0.242577	0.980	0.329	-0.242341	0.718150
pref_list	0.265407	0.107889	2.460	0.015	0.051813	0.479000
pties	0.111448	0.075133	1.480	0.141	-0.037299	0.260194
reput	0.045399	0.091617	0.500	0.621	-0.135982	0.226780
comp	0.094673	0.124318	0.760	0.448	-0.151448	0.340794
eff	0.183404	0.115820	1.580	0.116	-0.045893	0.412701
bene	0.136432	0.098013	1.390	0.166	-0.057610	0.330475
consist	0.259987	0.100554	2.590	0.011	0.060913	0.459060
compat	-0.110401	0.106820	-1.030	0.303	-0.321879	0.101077
_cons	0.820924	0.421003	1.950	0.053	-0.012562	1.654409

125 Randomly Selected From Each Firm

Source	SS	df	MS
Model	16.9513174	13	1.3039475
Residual	35.9798805	107	0.336260565
Total	52.9311979	120	0.441093316

Number of obs = 121
F(13, 107) = 3.88
trust
Prob > F = 0
R-squared = 0.3203
Adj R-squared = 0.2377
Root MSE = 0.57988

Variables	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
biotech	-0.016420	0.190633	-0.090	0.932	-0.394328	0.361488
pharma	-0.446036	0.135181	-3.300	0.001	-0.714017	-0.178056
newguy	0.171020	0.120533	1.420	0.159	-0.067922	0.409962
non_mngr	-0.266268	0.114171	-2.330	0.022	-0.492598	-0.039938
outsource	0.221440	0.282048	0.790	0.434	-0.337688	0.780568
pref_list	0.225702	0.112963	2.000	0.048	0.001767	0.449637
pties	0.137533	0.093550	1.470	0.144	-0.047918	0.322984
reput	-0.054437	0.103244	-0.530	0.599	-0.259107	0.150232
comp	0.003697	0.154289	0.020	0.981	-0.302162	0.309557
eff	0.282444	0.124289	2.270	0.025	0.036055	0.528833
bene	0.151060	0.114981	1.310	0.192	-0.076877	0.378997
consist	0.219449	0.135762	1.620	0.109	-0.049684	0.488582
compat	-0.156824	0.131040	-1.200	0.234	-0.416595	0.102948
_cons	1.524969	0.857842	1.780	0.078	-0.175603	3.225541

Figure 2 – Summary of Significant Results

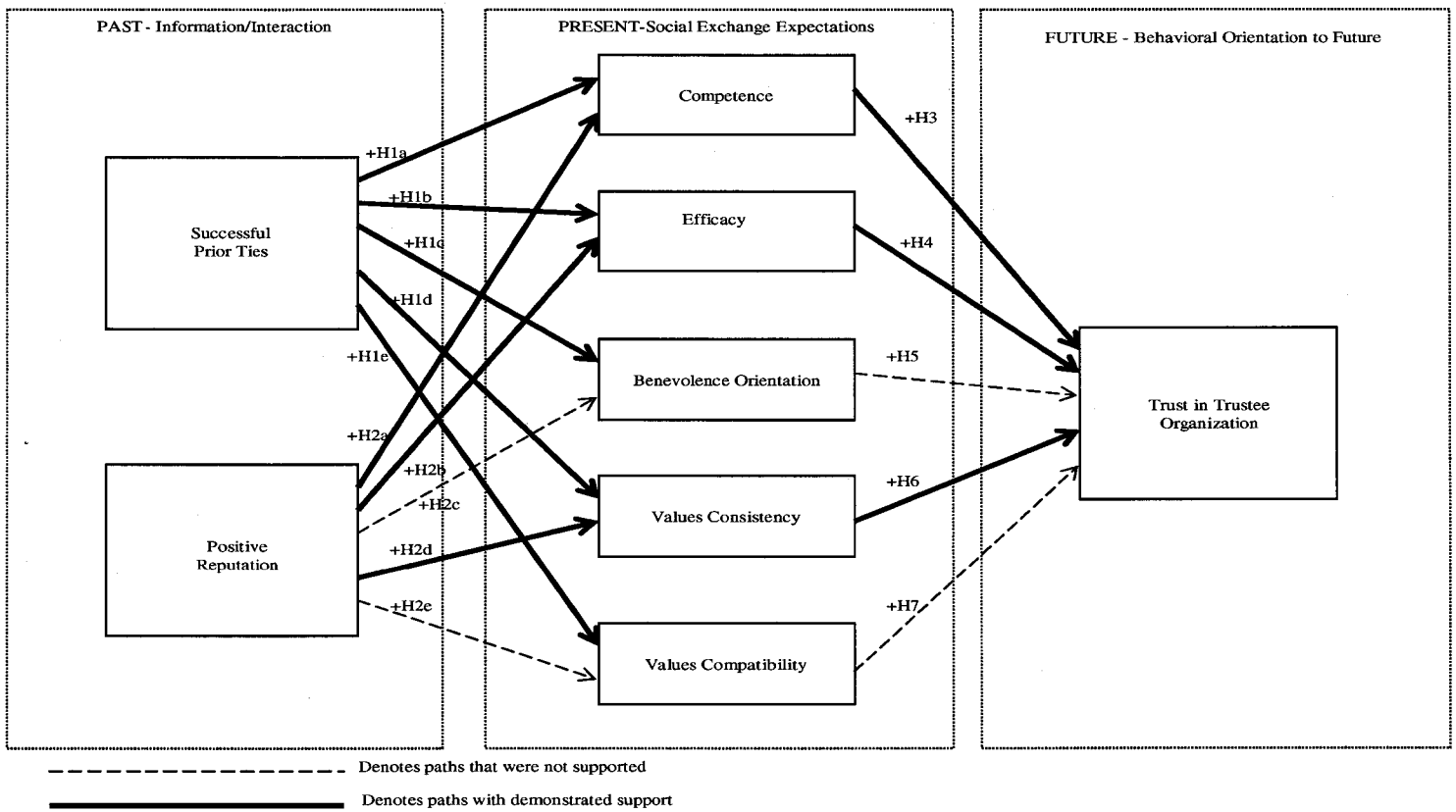


Figure 3 – Mediation Step 1

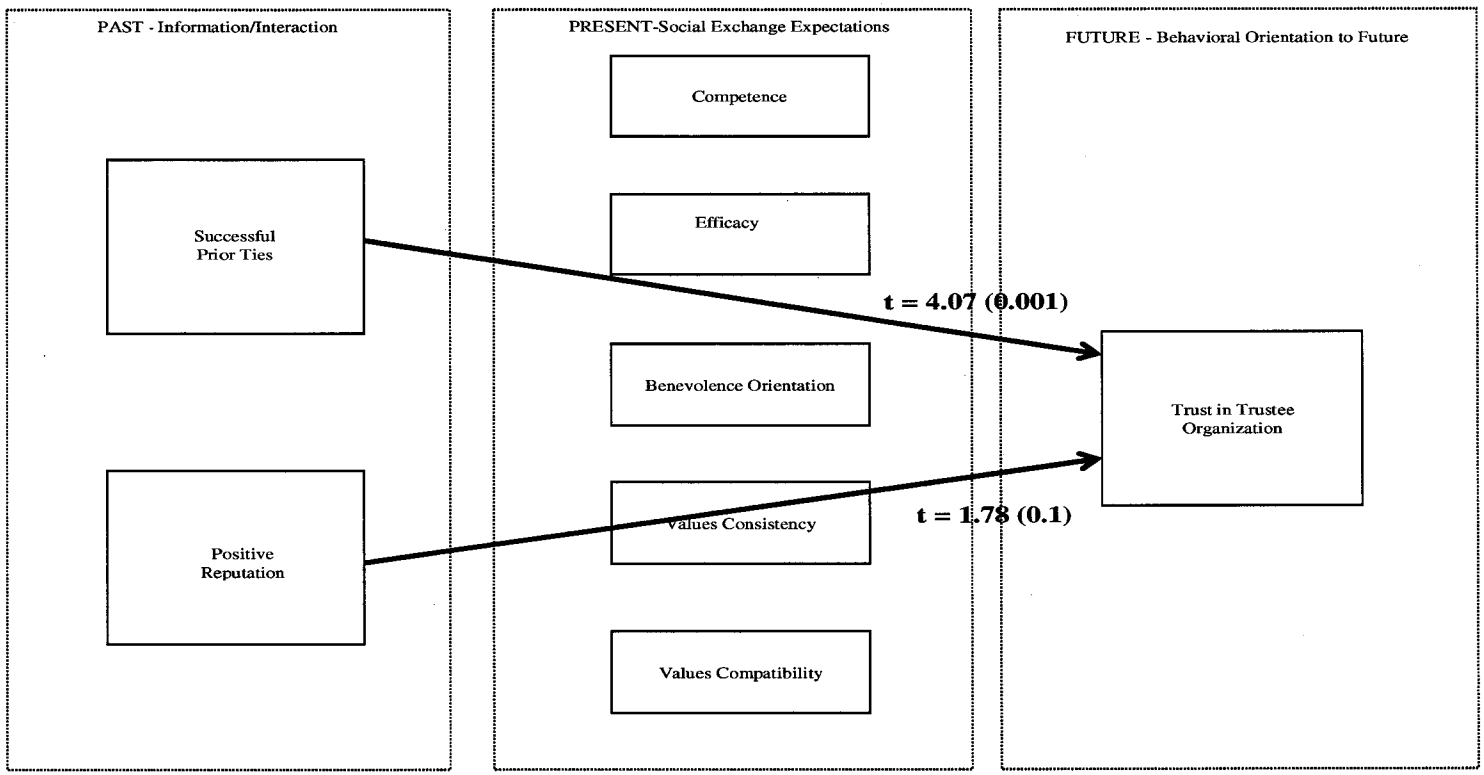


Figure 4 – Mediation Step 4

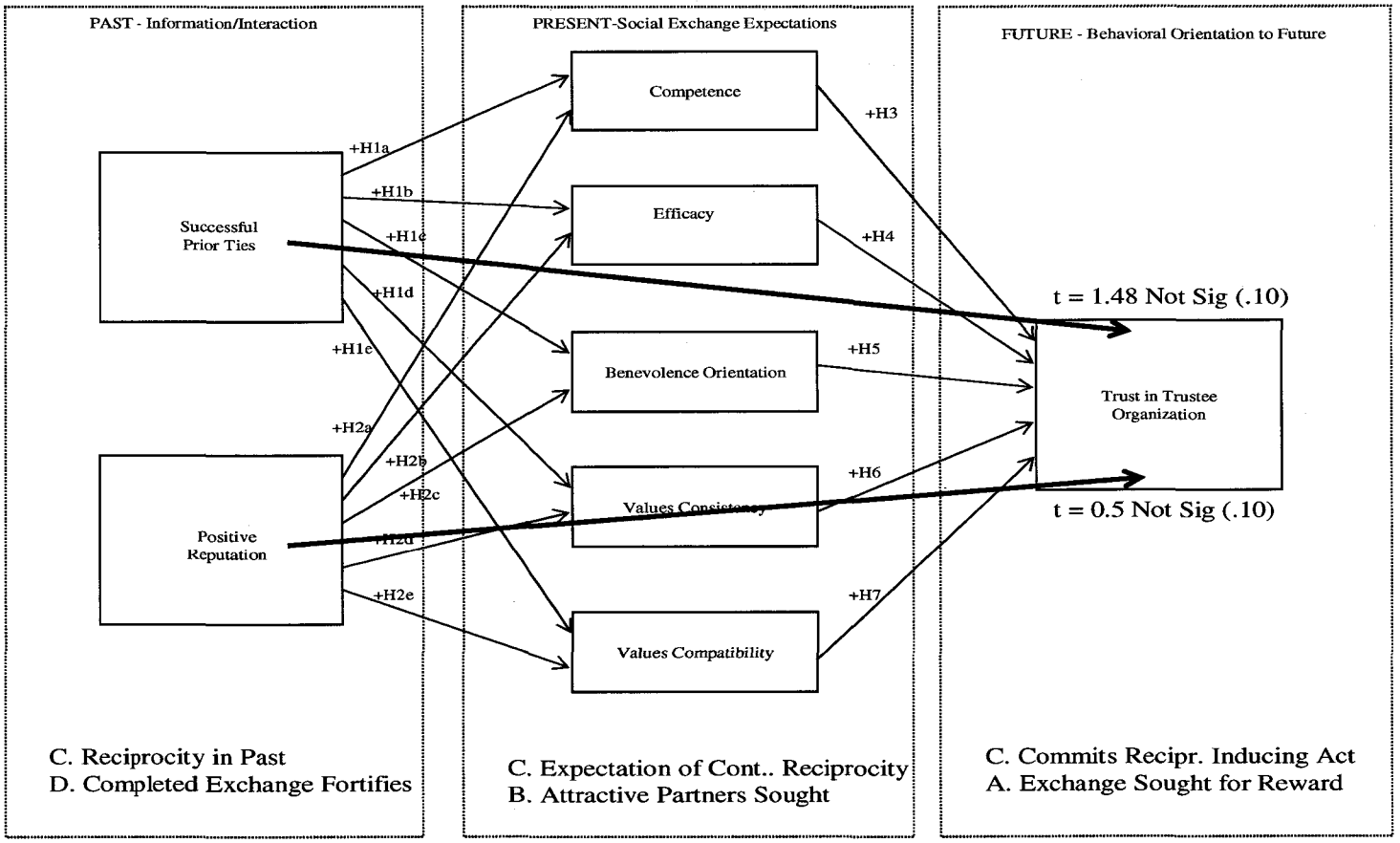
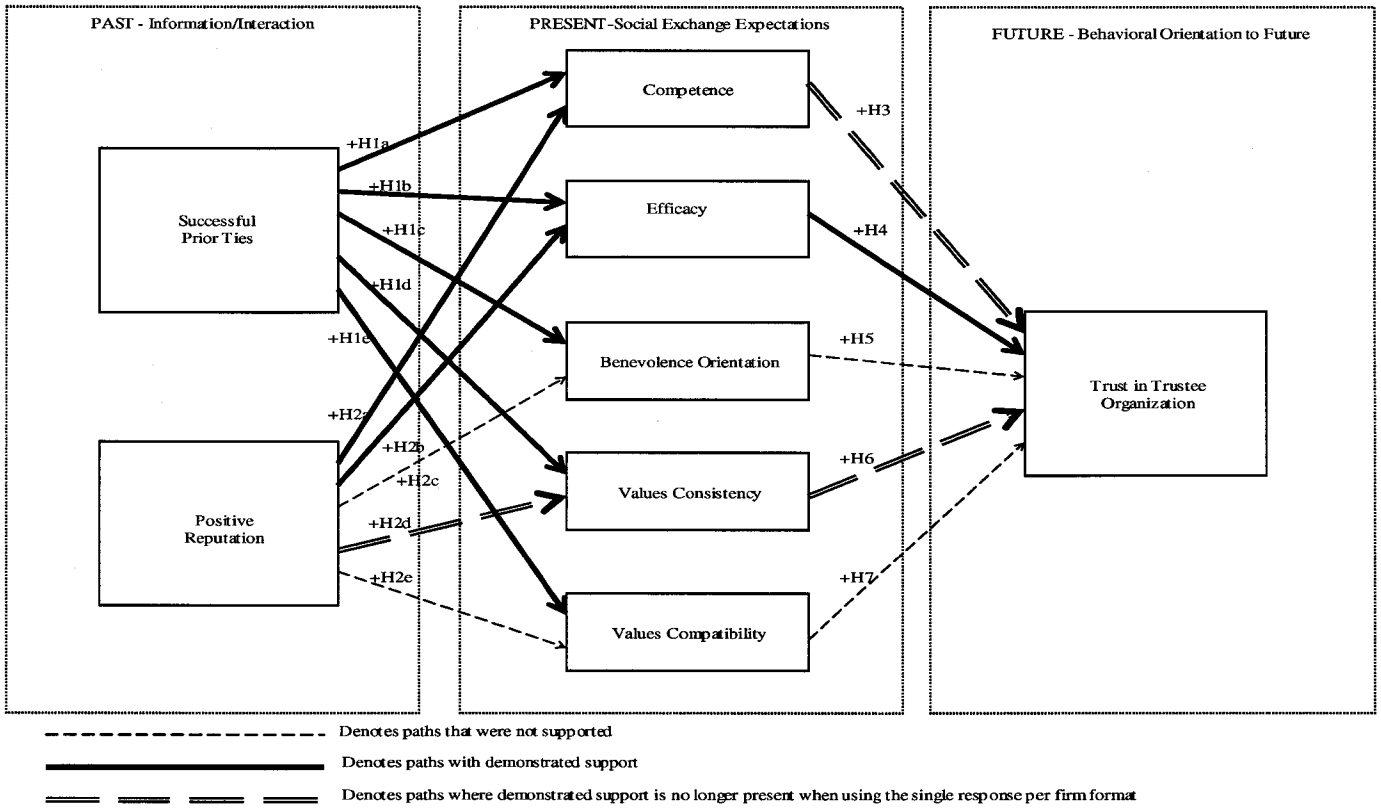


Figure 5 – Single Response Format



CHAPTER VI - DISCUSSION & CONCLUSION

Questions That Have Been Answered

Can Organizational Trust Exist?

The introduction of this study began with the question: can organizational trust exist? For some, this question should never have been asked. In 2001, a notable scholar[14] on trust stood before a session at the Academy of Management Annual Meeting and said that trust does not exist at an organizational level. For this statement he offered no particular evidence other than to say that trust is an expectation and therefore can only be held by individuals. His statement caused me to wonder about this question: If organizations can behave, a presumption that underlies the field of organizational behavior, then why cannot organizations trust? This study is an exploratory examination of an answer to that question.

An answer to the question of interorganizational trust is that evidence presented in this study suggests that organizations *can* trust. This study has provided theoretical ground work and empirical evidence suggesting that trust not only exists at the organizational level, but that it is a different creature than trust at an individual level of analysis. Only one study exists that expressly attempts to establish trust at the organizational level (Zaheer et al., 1998). Therefore this study is exploring relatively uncharted territory. The lack of organizational trust literature helps to explain the exploratory stance taken in this study.

The evidence presented in this study suggests that trust can exist at an organizational level in two ways. First, using a theoretically based model, items were

developed that successfully measured the existence of interorganizational trust and helped identify its antecedents. Second, throughout the process of interviewing industry participants and pretesting the instrument, there was, on the part of the participants, no failure to identify with the concept of interorganizational trust. Despite the claims of some trust scholars, practitioners have no problem conceiving of trust as an interorganizational phenomenon. Of the two conferences alluded to in the methods chapter, at least 25 percent of the conference content dealt with partnerships and creating trust between clinical trial sponsor and CROs. It is logical to conclude that if interorganizational trust did not exist, interviewees and survey respondents would have greater difficulty answering questions about the subject. In point of fact, interviewee and respondents did not hesitate to talk about it and were eager to understand the phenomenon.

What are Interorganizational Trust's Antecedents?

Using a theoretical model based on social exchange and agency theory a set of antecedents that were similar to individual level trust work was generated (Mayer et al., 1995). The results of this study suggest that three of the five hypothesized antecedents are positively and significantly predictive of interorganizational trust. These constructs included *competence*, *efficacy* and *values consistency*. The other two hypothesized antecedents proved to be positively related but not significant. These constructs included *benevolence* and *values compatibility*.

In explaining why some of the antecedents are significant and others are not, it is necessary to look at the nature and measurement of the antecedents themselves. The two

[14] Peter Ring is famous for making this claim in virtually every session in which he has either presented,

non-significant antecedents are more difficult to respondents to conceptualize in an organizational setting. While the notion of *benevolence* may resonate with individuals, it is less likely to resonate with organizational level activity. In pretest activities it took more time to articulate *benevolence* and *values compatibility* in ways that organizational representatives could comprehend. Thus, it may be that organizational representatives responding to a survey had difficulty conceiving of how two organizations could be *benevolent* towards one another.

One reason that competence, efficacy and values consistency are likely to resonate with representative from the organizations is due to the fact that these three antecedents are more likely to be measured by the trustor. Virtually every successful clinical trial sponsor has good records on CRO performance. These firms measure how long it took CROs to perform activities, and how able CROs were to comply with the promises made in the negotiation phase of the contract. These measures map nicely to the constructs *competence*, *efficacy* and *values consistency*. They do not map nicely to the more nebulous constructs of *benevolence* and *values consistency*.

Another explanation is that while *benevolence* and *values compatibility* may be important predictors of interorganizational trust, they are not as important as *competence*, *efficacy* and *values consistency*. Since these three constructs explained a large portion of the phenomenon, *benevolence* and *values compatibility* struggled to show a significant effect.

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served as a discussant, or asked a question.

Are prior ties and reputation important?

There are numerous trust articles that establish prior ties and reputation as antecedents for trust. However, the theoretical model constructed in the study did not support a direct relationship. In applying a time-based framework to the model, it was clear that a trustor's expectations had to have a source. The apparent source turned out to be information gathered internally based on prior relationships, or externally from reputational sources. A mediated relationship between prior ties and reputation was empirically established in this study. The two exogenous constructs (*successful prior ties* and *positive reputation*) are positively and significantly related to *interorganizational trust* when viewed in isolation. However, when the antecedents of *interorganizational trust* are included in the model (*competence, efficacy, benevolence, values consistency and values compatibility*), the relationships between *successful prior ties*, *positive reputation* and *interorganizational trust* are not significant. Thus, while they do correlate with *interorganizational trust*, the significance of their relationship is fully mediated by other constructs. This finding differs from the existing literature's characterization about the role of prior ties and reputation in predicting trust.

Are there other important considerations in interorganizational trust?

Type of Firm

This study's control variables were motivated by the extensive interview and pretest process. Their inclusion was fortuitous as they revealed some interesting findings. This study's results suggest that the type of sponsor firm being considered is important. The specific finding is that pharmaceutical firms are less likely to trust their clinical trial vendors than medical device and biotech firms. The conclusion might be that it is the

type of firm that matters. However, what this finding may really suggest is that firm size and dependence on outside vendors is important in predicting interorganizational trust. Pharmaceutical firms are not more likely to be populated by trustless bureaucrats, but they are likely to be larger[15] and have an in-house clinical trial testing capabilities. Thus, pharmaceutical firms are more likely to have staff that are extremely familiar with the clinical trial process and may feel threatened by the use of CROs. If any organizational type is likely to face a make-or-buy decision with respect to clinical trial work, it is pharmaceutical firms. Biotechnology and medical device firms are likely to be smaller and less likely to have an in-house clinical trial group. Thus, these organizations are more dependent on CROs and are more likely to perceive CROs as experts in clinical trials and not as firms that provide temporary clinical trial staff.

Tenure with firm

One control variable that proved informative was the length of the organizational representative's tenure with the sponsor. Trust has always been conceived as having a relational component that took time to develop. This study's operationalization of tenure and it relationship to interorganizational however, did not confirm this conceptualization of trust. Organizational representatives that have spent less than two years with the firms were no less likely to represent that their firms trust their CROs. This finding is wholly consistent with some of the newer conceptualizations of quick trust and with the notion that trust may be more a function of the institutionalized relationship of the two firms. Those firms that are interested in creating more trusting relationships with their vendors

[15] The relative size of pharmaceutical firms with respect to medical device and biotechnology firms was confirmed by an SIC code based analysis of sales and revenue figures. A significant percent of the pharmaceutical firms lists dwarf even the largest biotechnology and medical device firms.

would do well to concentrate on processes that help socialize new employees to the nature of the sponsor / CRO relationship.

Authority level with firm

Another control variable that provided interesting results was authority level. Stated in other terms, employees that managed people were operationalized as being higher in the hierarchy of the firm. This study's findings suggest that individuals with more authority (they manage others), are more likely to represent that their firm has higher levels of interorganizational trust. This finding is consistent with the pretest interviews. In these interviews a common lament was that people with little real authority at the sponsors were the primary managers of the CRO relationship. Representative from CROs suggested that upper management would advocate a partnering or trust based management style and then leave it to low level employees to implement. This finding confirms that if trust based interorganizational relationships are sought, the key organizational representative need to have adequate authority to enact change and draw on prior experience involving trust.

Preferred vendor lists

Pretest interviews revealed that some firms have actively engaged in establishing preferred vendor lists for outsourcing clinical trial work. This approach seemed unusual in an environment where the lowest cost, "hired-gun" mentality seemed to prevail. Indeed organizational representatives from those firms that developed a preferred vendor list were more likely to reflect interorganizational trust in CROs.

This finding is interesting for the following reasons. First, it helps establish the argument that organizations can trust. The preferred vendor list is in fact the

institutionalization of an interorganizational relationship, of which trust is certainly a component. By going to the effort to better understand their vendors, sponsors take information and record it in formal ways so that as personnel change, the relationship between the two firms does not have to be recreated. Second, it confirms the notion that trust is easier if you know who you are working with. If the development of the preferred vendor list is rigorous, the two firms cannot help but have a better idea about each other[16]. As noted in the model, knowledge that sheds light on the expectations of trust antecedents cannot help but develop higher levels of interorganizational trust.

Limitations

The rigor that has been incorporated into this study helps support a compelling argument about the previously stated findings. As with all studies however, this study is not without its limitations.

Common Source Bias

A limitation of this study is its use of a single source to measure both the independent and dependent variable. In this study, survey respondents answered items measuring both interorganizational trust and its antecedents. In an ideal setting, a different source should be used to provide information about the dependent variable. This condition is often referred to as single source or common source bias. It can present a problem because the independent and dependent variables are more likely to be

[16] This level of effort was described at a conference on sponsor and CRO partnerships by Jack Vandeventer. Dr. Vandeventer described in detail the number of site visits and face-to-face interactions that occurred as his firm, Eli Lilly & Co. undertook the process of developing a preferred vendor list (Vandeventer, 2002).

correlated. The risk of a Type I error, finding and effect when one does not exist, goes up.

This limitation was identified early in the study's development. However repeated attempts at identifying archival data were unsuccessful. Perhaps this study can be replicated in an industry setting where archival measures are more readily available.

Response rate

Another limitation of this study is that the response rate was low. Most likely because of factors such as, the technology used to gather the survey data, the saturation level of internet based surveys, or the length of the instrument, the survey's failure rate was large. While the number of people who filled out at least some of the questions was 40 percent of the population sample, the number of people who left the Web site without providing enough data (failure rate) was significant. If the failure rate could have been improved from 80 percent to 50 percent, the response rate would have been a more respectable 20 percent.

These factors are somewhat mitigated by a decent sample size and the fact that there is little reason to believe that there are systematic differences between the non-responders and responders. However, it provides researchers and readers greater comfort to obtain response rates closer to those normally encountered with paper-based, academic surveys.

All-Inclusive Model

While every attempt was made to create a comprehensive model of interorganizational trust, there is always a possibility that this goal was not accomplished.

There are likely to be other constructs that create, modify, or mediate interorganizational trust. This possibility violates a basic assumption inherent in regression models.

Because this research is exploratory, the possibilities for alternative explanations of the phenomenon are higher. Although there is a substantial amount of trust-based research at the individual level of analysis, there is a dearth of it at the organizational level of analysis. The effect is that there is little to draw from when trying to identify construct grist for consideration in model building. With only three antecedents showing a significant and positive relationship to interorganizational trust, it is likely that this study's model is underspecified. For example, it is likely that there is at least one unidentified construct that has a negative impact on interorganizational trust. More work in the area will reveal this study's missing components and help future researchers by giving them more grist to work with.

Industry Setting

The world of clinical trials is a fascinating and somewhat unusual place. It is a market that contains a unique blend of science and business, open markets and high levels of regulations. Because of the potential for human suffering that can occur, the clinical trial setting offers a unique opportunity to examine trust. However, these unique qualities may compromise this study's generalizability to other settings. At some level, outsourcing is outsourcing. But in a circumstance where the outsourced product is an electrical component vs. the service of managing an experimental compound for use in human beings, it would not be illogical to hope that there are some differences. If these differences can be identified and controlled in future work, it is possible that this study's findings can inform our conception of interorganizational trust in other settings.

Future Research

Future work in this area should continue to focus on levels of analysis issues. The criticality to this field has already been demonstrated and should continue to guide future work. Since this study has established that interorganizational trust is likely to exist, future work should continue to focus on what makes it different from interpersonal trust. A promising area to focus on would be the concept of institutionalized trust. Thinking back to this study's opening example, how did trust between Henry Ford and Harvey Firestone grow to transcend the relationship of these two individuals? What were the processes that helped institutionalize the relationship of the two leaders so that the organizations could continue to function as though Harvey and Harry were still corresponding by telegram?

Another area where further research is needed is in operationalizing measures of interorganizational trust. It would be interesting to know whether the results obtained in the study would be consistent with the results obtained if this study had used multiple respondents from each firm. A relevant question to drive this research forward is what is the actual level of interrater reliability for a construct like interorganizational trust? While some scholars are proponents of multiple responses per firm (Zaheer et al., 1998), there is some evidence that the value of interrater reliability analysis is overrated (Murphy & De Shon, 2000). These authors note that three potentially erroneous assumptions anchor much of the work on interrater reliability. It would be compelling to see if a multiple respondent version of this study could shed some light on the issues raised by Murphy & De Shon (2000).

Another operationalization issue that is worthy of further research is the ability of preferred vendor lists to serve as a proxy for institutionalized trust. This study showed that the existence of a preferred vendor list is important for interorganizational trust. A future study could specifically explore various aspects of preferred vendor development. What is it that is important about preferred vendor development? Is it the process itself? Or, it is the fact that the relationship has been formalized?

Conclusion

Although not all the hypothesized relationships in this study proved to be significant, many were significant. For the relationships that were not captured, there are some plausible explanations. One particularly interesting finding suggests that two variables often used as antecedents to interorganizational trust are not as significant in light of other constructs. The finding helps clarify some confusion in the literature about the role of these two variables. Furthermore, this study yields findings that will be of particular interest to those in industry. Given the economic realities of clinical trial work, any decrease in the time it takes to get products to market yields significant savings. My belief that trust based contracts encounter fewer frictions is shared by the clinical trial industry. This group of clinicians and business people is eager to understand the antecedents and role of interorganizational trust.

This study is one of the first, of what I predict to be many, aimed at extending the existing literature on trust to the organizational level of analysis. While there will always be those who deny that trust can operate at the organizational level of analysis, most scholars are not so quick to conclude. Rather, these scholars are interested in answering

the questions about interorganizational trust in theoretical and empirical ways. This study is dedicated to those scholars. I hope that this exploratory study will serve as an initial step towards answering difficult questions about interorganizational trust.

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APPENDIX A - CLINICAL TRIAL PROCESS

The clinical trial process for human drugs in the United States is complex and requires that firms possess specialized skills and financial resources. Although the following is not an all-inclusive description of the clinical trial process, the major components of the process are articulated below.

When a firm identifies a chemical compound with potential to be developed as a drug, the firm files an Investigator New Drug (IND) application with the Food and Drug Administration (FDA). In this application the firm describes items such as the drug's chemical composition, manufacturing and quality control procedures, the drug's packaging and an assortment of other safety issues.

Subsequent to the filing of an IND, the firm will begin the first of five phases. In ***Phase I***, a drug is tested on a relatively small number of human subjects to determine elements such as toxicity (the potentially poisonous effects on the body), dosing (the proper quantity of the drug for human consumption) and pharmacokinetics (how a compound moves in the body). The subjects used in this phase typically are healthy males.

In ***Phase II*** clinical trials, the drug is tested on a larger number of subjects. These subjects, both male and female, have been diagnosed with the disease that the drug is intended to target. In early trials for Phase II, only female subjects who are determined to be non-childbearing (no longer capable of bearing children) are tested. In later trials for Phase II, non-pregnant females are included in the study. The purpose of this phase is to assess such attributes as dose responses and to confirm some of the earlier safety concerns.

Phase III clinical trials test the drug in a much larger number of affected subjects. While this test is concerned with the safety of the compound, it is primarily concerned with demonstrating the compound's efficacy. Other issues like drug interactions and effects in certain organs or sections of the population may be included in this phase.

Phase IV clinical trials are similar to Phase III clinical trials. However, Phase IV trials typically involve drugs that have already been approved by the FDA for a particular indication. An indication means that the FDA has approved a drug for use in humans diagnosed with a particular disease; for example, Zyprexa is indicated for schizophrenia. If Eli Lilly & Co., manufacturer of Zyprexa, wished to promote this drug for sufferers of bipolar disorder, they would file with the FDA for a new indication. Since Zyprexa has already been through the first three phases in route to its use in patients with schizophrenia, it would be unnecessary to repeat the safety-oriented tests common to Phases I and II. Instead, Zyprexa would undergo a Phase IV clinical trial. This clinical trial would consist of a large subject sample of bipolar afflicted patients. The goal of a Phase IV clinical trial is to assess an approved drug's efficacy against a new disease.

After Phase III or IV is completed, the sponsoring firm will submit the results of these tests and reams of other information to the FDA in a New Drug Application (NDA). Although the process is common to many tested compounds, there are numerous exceptions to this process for so-called orphan or fast track drugs.

The Organizations

This study is concerned primarily with the activity that takes place in Phases II, III and IV. These phases of the clinical trial process, although serving different clinical purposes, all tend to involve large numbers of human subjects. Due to the inherently

large number of subjects and massive logistical and data processing challenges, these phases are the most likely to require the outsourcing of tasks to other organizations. The involvement of other organizations in a high-risk environment provides this study with an opportunity to examine a high trust interorganizational environment. A discussion of the organizations involved in clinical trials will follow.

There are three kinds of organizations involved in clinical trials. First, there are firms that are referred to as ***sponsors***. These sponsors tend to be pharmaceutical firms, medical device firms, and biotech firms. These firms develop the drug compounds (or in the case of device firms, mechanical devices), initiate testing, and determine the extent of outsourced clinical trial work. Ultimately, the FDA holds the sponsors responsible for the NDA submission, its contents, and the future performance of the tested drug.

Second, there are organizations that serve as agents to help administer the clinical trial. These organizations are referred to as ***contract research organizations*** or ***site management organization*** **(CROs)**[17]. Although the level of CRO involvement in outsourced clinical trial work varies across contracts, the overriding feature of all work involving CROs is that someone outside the hierarchy of the firm that developed the compound is involved in a sensitive and costly aspect of the business. The FDA views the CROs as service providers working for the sponsor, or in some rare cases, the sites. As such, they are not held responsible for the contents of the NDA. Thus, their participation on a clinical trial is not consistently reported in the NDA (Jones, 2001). The

[17] Another organization that plays a similar role is the Academic Research Organization (ARO). Whereas the CRO is usually for-profit firm, the ARO is more likely to be affiliated with a university teaching hospital.

only responsibility held by the CRO is to the sponsor, and this responsibility is legally limited to the terms of the contract.

The final organization in the clinical trial process is the ***site***. These organizations are responsible for recruiting subjects and conducting the clinical trial. The sponsor, and in some rare cases the CRO, develops a protocol. The protocol is a document that governs most aspects of the clinical trial. The protocol includes but is not limited to sections that describe the eligibility of patients, the number of sites and individuals from each site to be used, the types of information to be gathered about patients, how the drug regime is to be administered, the timing of the study, how often monitoring will occur, and numerous other details. These organizations consist of university medical centers, hospitals, and private physicians. Unlike CROs that rarely receive much scrutiny from the FDA, the individual physicians, also known as investigators, are responsible to the FDA for their conduct and proper administration of the clinical trial protocol. Physicians can be and are sanctioned by the FDA for inappropriate behavior in the conduct of a clinical trial. Examples of sanctionable behaviors include falsifying data, failing to closely monitor patient health and unlawful dispensing of the compound being reviewed in the trial.

As noted earlier, Phases II, III and IV typically involve a large number of human subjects. Consequently, these phases are very labor intensive and the sponsor often outsources their administration to a CRO. However, recent industry trends show that an increasing number of CROs are also specializing in providing Phase I services.

APPENDIX B – WEB BASED SURVEY

Research Questionnaire: Outsourcing Relationships in Clinical Trials

Background

The purpose of this project is to identify key aspects of the outsourcing relationship between clinical trial sponsors and clinical trial service providers (CROs and SMOs). This survey is intended for individuals that work for clinical trial sponsors. If you qualify and complete this survey, your name will be entered in a drawing for a **$500 gift certificate**.

Confidentiality

The information you provide is **completely confidential** and your individual responses will be deleted once they have been combined with information gathered from other members of your firm. **Under no circumstances will your answers or the firm's ratings be revealed.**

General Instructions

This questionnaire has two short sections: (1) questions about your firm and general demographics; and (2) questions regarding your firm's approach to outsourcing management in clinical trials. To assure that your data is accurately recorded, do not use your browser's "Back" button until you complete the survey.

Continue>>

Part I
Individual and Firm Demographics

These questions assess background information about you and your firm that is important to the study. Drop-down boxes have been provided for many of the questions. If you do not see the relevant item listed in the pick-list, please select Other, and type in your response. Click the *Continue* button to proceed.

Where did you hear about this survey?	Other:
What label best characterizes the firm you work for?	Other:
What is your firm's name?	Other:
How long have you worked for this firm?	
What phrase best characterizes your work?	
How many people in your firm work directly with CROs/SMOs?	
How many people in your department work directly with CROs/SMOs?	
How long have you worked in this department?	
What % of your firm's clinical trial work is outsourced?	

Does your firm have a preferred vendor list (a list of vendors that your management has suggested you use)?	
If you answered "Yes" to the previous question, please complete this question: If you do have a preferred vendor list, what % of your firm's clinical trial work is outsourced to the CROs/SMOs on the preferred vendor list?	

Continue>>

PART II
How Does YOUR FIRM Manage Its Clinical Trial Outsourcing?

1. In the fields below, please list the four CROs or SMOs that you work with the most. If you don't have experience with four firms, list as many as you can.

CRO I:		Other:	
CRO II:		Other:	
CRO III:		Other:	
CRO IV:		Other:	

2. On the next page the names of the firms you entered will appear in column headings. There will be a series of statements describing how **your firm** manages CROs/SMOs. For each statement, please enter the number that best

indicates how much you agree that the statement accurately describes how **your firm** acts with respect to the listed CROs/SMOs. For each CRO or SMO listed, answer the question using a scale from 1 to 7 (1 representing Strongly Disagree and 7 representing Strongly Agree). Please enter a number, using the picklist or manual entry, for each question for each firm in the space provided. The number that you provide in each space corresponds to how much you agree that the statement describes your firm's (or your vendor's) **actual** behavior rather than how you think they should ideally behave.

Continue>>

CRO Names (previously entered):	**I) CRO Name #1**	**II) CRO Name #2**	**III) CRO Name #3**	**IV) CRO Name #4**
Scale Reference (Please leave the item blank if you don't know):	Strongly Disagree 1 2 3	Neutral 4 5 6	Strongly Agree 7	
CRO has specialized skills that can increase my firm's performance	I)	II)	III)	IV)
CRO is able to complete its assigned tasks in the allotted amount of time	I)	II)	III)	IV)
My firm never has to wonder whether CRO will keep its word	I)	II)	III)	IV)
CRO takes advantage of unforeseen events	I)	II)	III)	IV)

CRO is very capable of performing the work my firm hired them to do	I)	II)	III)	IV)
CRO does not consistently meet its deadlines	I)	II)	III)	IV)
When dealing with my firm, sound principles seem to guide CRO	I)	II)	III)	IV)
My firm believes that CRO can be relied on to fulfill its obligations	I)	II)	III)	IV)
One of the reasons that CRO is on the list of preferred vendors is due to successful past experiences with our firm (Place a zero in the column if the CRO is not preferred)	I)	II)	III)	IV)
Overall, CRO is well qualified to do clinical trial work	I)	II)	III)	IV)
CRO is able to complete assigned tasks on a timely basis given a minimum of personnel	I)	II)	III)	IV)

The values of CRO and those of my firm are very compatible	I)	II)	III)	IV)
My firm feels that CRO acts in a predictable manner	I)	II)	III)	IV)
In general, my firm values this CRO because we have had more successful experiences with them than we have had with other CROs	I)	II)	III)	IV)
CRO is known to be successful at the clinical trial work it does	I)	II)	III)	IV)
Tasks that take other CROs a great deal of time are readily completed by CRO	I)	II)	III)	IV)
My firm's goals and objectives for the clinical trial are shared by CRO	I)	II)	III)	IV)
My firm would feel a sense of betrayal if CRO's performance was below expectations	I)	II)	III)	IV)

Continue>>

CRO Names
(previously entered): **I) CRO Name #1 II) CRO Name #2 III) CRO Name #3 IV) CRO Name #4**

Scale Reference
(Please leave the item blank if you don't know): Strongly Disagree 1 2 3 Neutral 4 Strongly Agree 5 6 7

Based on external sources, my firm views CRO as an organization with a good name	I)	II)	III)	IV)
CRO is on the list of preferred CRO providers, in part, because of their level of competency at clinical trial work (Leave blank if the CRO is not preferred or if there is no preferred vendor list)	I)	II)	III)	IV)
CRO is concerned about my firm's welfare	I)	II)	III)	IV)
CRO had similar motives for working on this project	I)	II)	III)	IV)
My firm does not re-analyze the clinical trial data provided by CRO	I)	II)	III)	IV)

Because of things my firm has heard from others, the character of CRO is in question by my firm	I)	II)	III)	IV)
CRO is inexpensive and still manages to do a quality job	I)	II)	III)	IV)
CRO will go out of its way to clear up misunderstandings with my firm	I)	II)	III)	IV)
My firm relates well to the values of CRO	I)	II)	III)	IV)
Work done in the past with CRO has helped my firm reach its goals	I)	II)	III)	IV)
Even before my firm worked with this CRO, it was a CRO we viewed as being in good standing in the industry	I)	II)	III)	IV)
CRO consistently meets the deadlines given by my firm	I)	II)	III)	IV)
My firm's needs are important to CRO	I)	II)	III)	IV)

My firm would be willing to give CRO a task that is critical even if we could not monitor its actions	I)	II)	III)	IV)
Because of positive interactions in the past, my firm is now doing more business with CRO	I)	II)	III)	IV)
My firm feels that working with CRO conveys high status to other firms in the industry	I)	II)	III)	IV)
CRO is reluctant to charge us extra because of unforeseen circumstances	I)	II)	III)	IV)
CRO is consistent with respect to what they say and do	I)	II)	III)	IV)
My firm monitors this CRO less than other CROs	I)	II)	III)	IV)

Continue>>

Concluding Questions

We are seeking large number of responses from your firm. If you are willing to forward the survey URL to your colleagues please do so. This step is not required and you will be entered in the $500 gift certificate drawing regardless of your response.

In order to make forwarding easier, the next screen will include text that can be copied to your email program. Instructions will be provided to assist you with this process.

After answering the next three questions, please include your name and email so that you will be entered in the **$500 gift certificate** drawing.

How certain are you in your knowledge of your firm's activities with CRO/SMOs?	
Will you forward the survey URL (Include here) to your colleagues?	
If yes, how many will your forward it to?	
What is your name? (As previously noted, your confidentiality is assured. Your name and email will only be used to notify you if you have won the prize drawing.)	
What is your email?	

Don't forget to click the *Finish* button!

BAIL OUT PAGE

Thank You

Thank you for your interest in this study. At this time, your responses suggest that you do not meet the study's qualifications.

If you feel that you have reached this page in error, or if you would like more information about this survey, please contact the primary investigator at ccaldwel@butler.edu.

Craig B. Caldwell
Berg Center for the Study of Ethics and Leadership
Katz Graduate School of Business
University of Pittsburgh

(317) 940-8154
ccaldwel@butler.edu

APPENDIX C - SURVEY CORRESPONDENCE

Email Invitation

Dear Clinical Research Professional:

A worldwide clinical research membership organization would like your opinions on a 13-minute Web survey. The Association of Clinical Research Professionals (ACRP) is not the sponsor of this research, but is helping to solicit responses to this important industry survey and will receive survey data. Your responses will be kept anonymous and strictly confidential. All respondents will be entered in a drawing to win a $500 American Express gift certificate.

Your participation in industry surveys of this kind is critically important for advancing the principles and practices in the clinical trial profession.

Thank you in advance for participating. If you have specific questions about the survey, please contact the primary investigator at ccaldwel@butler.edu. To begin the survey, click on the link below or cut and paste the URL into your Web browser.

http://www.butler.edu/cba/clinicaltrialsurvey

Paul Groth
Director of Certification and Accreditation
Association of Clinical Research Professionals
500 Montgomery Street, Suite 800
Alexandria, Virginia 22314
(703) 254-8100
paul@acrpnet.org

APPENDIX C – Cont.
Email 1st Reminder

Dear Clinical Research Professional,

Recently we sent an email notifying you about an opportunity to participate in an important industry study. Listed below is a survey progress report from the primary investigator. If you have already completed the survey, please accept our thanks. If you haven't had an opportunity to complete the survey, here is a reminder.

A worldwide clinical research membership organization would like your opinions on a 15-minute web survey. The Association of Clinical Research Professionals (ACRP) is not the sponsor of this research but is helping to solicit responses to this important industry survey and will receive the survey data. Your responses will be kept anonymous and strictly confidential. All respondents completing the survey will be entered in a drawing to win a $500 American Express gift certificate.

Your participation in industry surveys of this kind is critically important for advancing the principles and practices in the clinical trial profession.

Thank you in advance for participating. If you have specific questions about the survey, please contact the primary investigator at ccaldwel@butler.edu. To begin the survey, click on the link below or cut and paste the URL into your web browser:

http://www.butler.edu/cba/clinicaltrialsurvey

Paul Groth
Director of Certification and Accreditation
Association of Clinical Research Professionals
500 Montgomery Street, Suite 800
Alexandria, Virginia 22314
(703) 254-8100
paul@acrpnet.org

Survey Update:

As of yesterday, 79 individuals had completed the survey in its entirety (filled out the entire survey, provided valid answers for the questions asked, and gave answers evaluating at least one CRO). While this is not quite enough to complete the survey it is good news for anyone contemplating a response. The odds of winning a $500 gift certificate are 1 in 80 for the next person who fills out the survey.

My thanks to those who have already completed the survey and thanks also to those who have taken the time to provide me direct feedback about the survey. As experts, your opinions are appreciated.

Craig Caldwell
Primary Investigator
Berg Center
Katz Graduate School of Business
ccaldwel@butler.edu

APPENDIX C – Cont.
Email 2nd Reminder

Dear Clinical Research Professional,

Recently we sent two emails notifying you about an opportunity to participate in an important industry study. Listed below is a survey progress report from the primary investigator. If you have already completed the survey, please accept our thanks. If you haven't had an opportunity to complete the survey, here is the **final** reminder.

A worldwide clinical research membership organization would like your opinions on a 15-minute web survey. The Association of Clinical Research Professionals (ACRP) is not the sponsor of this research but is helping to solicit responses to this important industry survey and will receive the survey data. Your responses will be kept anonymous and strictly confidential. All respondents completing the survey will be entered in a drawing to win a $500 American Express gift certificate.

Your participation in industry surveys of this kind is critically important for advancing the principles and practices in the clinical trial profession.

Thank you in advance for participating. If you have specific questions about the survey, please contact the primary investigator at ccaldwel@butler.edu. To begin the survey, click on the link below or cut and paste the URL into your web browser:

http://www.butler.edu/cba/clinicaltrialsurvey

Paul Groth
Director of Certification and Accreditation
Association of Clinical Research Professionals
500 Montgomery Street, Suite 800
Alexandria, Virginia 22314
(703) 254-8100
paul@acrpnet.org

Survey Update:

There is no need to unsubscribe from this list as this is the last reminder you will receive. As of yesterday, 163 individuals had completed the survey in its entirety (filled out the entire survey, provided valid answers for the questions asked, and gave answers evaluating at least one CRO). Thus, the odds of winning a $500 gift certificate are 1 in 164 for the next person who fills out the survey.

My thanks to those who have already completed the survey and thanks also to those who have taken the time to provide me direct feedback about the survey. As experts, your opinions are appreciated.

Craig Caldwell
Primary Investigator
Berg Center
Katz Graduate School of Business
ccaldwel@butler.edu

VITA

CRAIG B. CALDWELL

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College of Business Administration
Butler University
Indianapolis, IN 46208
Tel: (317) 940-8154
Email: ccaldwel@butler.edu

HOME ADDRESS
818 E 58th St.
Indianapolis, IN 46220
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EDUCATION

Ph.D. Candidate Degree Expected Summer 2002
University of Pittsburgh - Katz Graduate School of Business - Pittsburgh, PA
Dissertation: "An exploration of the antecedents of interorganizational trust: Examining the trust placed in vendors conducting outsourced clinical trials."

Major Areas
- Social and Interorganizational Issues in Strategic Management
- Agency Theory
- Values in Management

Master of Business Administration, December 1993
Virginia Polytechnic Institute and State University - R.B. Pamplin School of Business - Blacksburg, VA

Major Area
- Management

B.A., May 1988
Anderson University, Anderson, IN

Major Area
- Accounting

SCHOLARLY INTERESTS

Teaching
- Strategic Management
- Business and Society
- Organizational Theory

Research
- Socio-economic Exchange
- Relational Aspects of Agency Theory
- Values of Top Management Teams

PUBLICATIONS AND CONFERENCE PRESENTATIONS

Publications

Agle, B.R. & Caldwell, C.B. 1999. Understanding research on values in business: A level of analysis framework. ***Business & Society***, 38(3):326-387.

Proceedings

Caldwell, C.B. 1997. A direct examination of the indirect relationship between CSR and financial performance. In K. Rehbein (Ed.), ***Proceedings of the Eighth Annual Meeting of the International Association for Business and Society***. San Destin, Florida.

Caldwell, C.B. 1996. Shortening the leap of faith in the values/performance link: Shared organizational values and strategy implementation. In K. Rehbein (Ed.), ***Proceedings of the Seventh Annual Meeting of the International Association for Business and Society.*** Santa Fe, New Mexico.

Caldwell, C.B. 1996. Reconciling the irreconcilable difference: Issues of level in business and society research. In K. Rehbein (Ed.), ***Proceedings of the Seventh Annual Meeting of the International Association for Business and Society.*** Santa Fe, New Mexico.

Refereed Conference Papers

Caldwell, C. B. 2002. ***Goal & social ties: A theory of governance structures.*** Presented at the Midwest Academy of Management. Indianapolis, Indiana

Caldwell, C.B. 1998. ***The tail wagging the dog: Agents who control their principals.*** Presented at the Ninth Annual Meeting of the International Association for Business and Society. Kailua-Kona, Hawaii.

Caldwell, C.B. 1995. ***A review of the empirical work in values: A call for greater attention to levels of analysis.*** Presented at the Society of Business Ethics Conference, Vancouver, British Colombia.

Work in Process

Caldwell, C.B. 2003. ***An empirical test of interorganizational trust: Evidence from clinical trial outsourcing.*** Unpublished Working Paper, Butler University, Indianapolis, Indiana.

TEACHING EXPERIENCE

Lecturer, Spring 1999-Present
Butler University — *Business Ethics* (Undergraduate)
Administrative Policy (Undergraduate)

Substitute Lecturer, Fall 1996-Spring 1997
University of Pittsburgh — *Ethics in the Business Environment* (Graduate)
Strategic Management (Undergraduate)
Business & Society (Undergraduate)

Part-time Instructor
Indiana Dept. Of Education, 1994, 1999-Present

Motorcycle Safety: Riding and Street Skills
Motorcycle Safety: Experienced Rider Class

Florida Rider Training Program, 1997-1998
Motorcycle Safety: Riding and Street Skills
Motorcycle Safety: Experienced Rider Class

Pennsylvania Dept. of Transportation, 1995-1997
Motorcycle Safety: Riding and Street Skills
Motorcycle Safety: Experienced Rider Class

MANAGERIAL EXPERIENCE

Senior Auditor, August 1991-August 1992
Ernst & Young (Audit Practice), Indianapolis, IN

Consultant, August 1989-August 1991
Ernst & Young (Litigation, Insolvency & Bankruptcy Group), Indianapolis, IN

Auditor, August 1988-August 1991
Ernst & Young (Audit Practice), Indianapolis, IN

SCHOLARLY ACTIVITIES

Professional Academic Associations

Academy of Management

- Business Policy and Strategy (BPS), 1994--Present
- Social Issues in Management (SIM), 1994--Present
- International Management, 1994--Present

International Association for Business and Society (IABS), 1994--Present

Society for Business Ethics (SBE), 1994--Present

External Reviewer

Business & Society, Editor Jeanne Logsdon
Journal of Business Ethics, Editor George Brenkert
International Association for Business & Society Conferences 1996, 1997, 1998, 2000
Academy of Management Conference, SIM Division 1996,1998, 2000-2002 (Named to Top 10 Reviewers for 2002)

Grants, Scholarships and Awards

David Berg Family Fund Fellowship, Funded first three years of Ph.D.
Merit Scholarship, $3,000, Virginia Tech
Indiana CPA Society - Outstanding Student Award, Anderson University
Senior Honors Convocation Speaker, Anderson University