1. INTRODUCTION

One of the most widely accepted principles of systems analysis and design is that user participation in the system development process increases their satisfaction with the results. This principle, drawn from Participative Decision Making (PDM) theory, is also one of the most frequently studied in the MIS literature. But, comprehensive reviews by Ives and Olson [1984], Pettingell et al. [1988], and Straub and Trower [1988] show that the observed relationship between participation and satisfaction, while positive, has been weaker than most researchers expected to find.

There are two obvious explanations for this apparent contradiction of theory and empirical results. Either the data or the theory must be wrong. Initially, the data was criticized (e.g., Ives and Olson [1984]). However, as discussed in Section 2, flaws in methodology are more likely to have overestimated the true participation-satisfaction relationship. Moreover, more recent and rigorous studies (e.g., Doll and Torkzadeh [1989], Franz and Robey [1986], Hartwick and Barki [1994], and McKeen et al. [1994]) continue to report weak relationships between participation and satisfaction.

As a result, the theory itself has become suspect. Hartwick and Barki [1994] (the most recent of a series of papers) suggest researchers focus instead on psychological involvement. McKeen et al. [1994, p.442] conclude, "It is more likely that user participation, by itself, is really only capable of explaining a certain (perhaps low) proportion of the total variance in user satisfaction." But no reason is offered to explain why participation has been (apparently) so over-rated by so many researchers and practitioners for so long.

We believe there is a third explanation which relies on a deeper examination of the reasons why users participate and the different types of participation which may result (as discussed in Section 3). Most researchers assume that users participate when they want projects to succeed and that their participation provides, among other things, the knowledge needed to design a good system. Such participation ought to be beneficial and we believe that it is.

However, we also believe that some participation has very different motivations. Some users participate because they do not trust the analyst. Others may participate because they believe the project poses risks for their organizations and their own careers. The theoretical base for such "Control Participation" lies not with PDM theory, but in research on organizational control and trust (e.g., Ring and Van de Ven

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1 We refer to user participation rather than user involvement in this paper to be consistent with their terminology.
[1989] and Ouchi [1977, 1980] which are further discussed in Section 4). High participation of this type is associated with projects which are less likely to succeed.

We believe this paper makes three important contributions to the user participation literature. First, we offer a theoretically-based model which shows that high participation is consistent with poor outcomes under some conditions. Second, we offer empirical evidence to show these conditions (low trust and high risk) do tend to increase participation. Third, we bring a fresh perspective to participation research and renewed support for the widely-held belief that user participation at least in some forms does make an important contribution to the success of system development projects.

2. RELATIONSHIP OF USER PARTICIPATION TO SATISFACTION

Although researchers have generally expected to find a stronger relationship between participation and user satisfaction (the most commonly used outcome measure in user participation research), a meta-analysis of 30 studies shows a combined correlation of only 0.28 [Straub and Trower 1988]. A popular explanation, held by many who believe in the value of participation, is that the true relationship is being underestimated due to methodological weaknesses. But, a review of four major weaknesses identified by Ives and Olson [1984] and [Pettingell et al. 1988] shows that methodological bias, if it exists, might well have overestimated, rather than underestimated, the true relationship.

1 Researchers used poor instruments or lacked control over research settings

The measures used in early MIS research on user participation were rarely validated. Nevertheless, these instruments exhibit apparent face validity and are "extremely consistent" [Pettingell et al. 1988, p.228]. Moreover, as Hartwick and Barki [1994] and McKeen et al. [1994] point out, more recent research studies with greater methodological rigor have found similar weak results.

One of the most pointed criticisms is that most studies measured participation retroactively, and simultaneously with project outcome measures. As Ives and Olson [1984, p.600] suggested, and Hawk and Aldag [1990] later verified, positive correlations could be attributed to "common method variance, 'halo' effects or statistical artifice." Thus, this particular flaw may well have increased, rather than decreased, the observed correlation between participation and satisfaction.

2 Research lacked a "rigorous conceptual foundation"

A conceptual foundation is needed to define key constructs, establish well-articulated hypotheses, and design and validate instruments to test them. Neither the independent (participation) nor the dependent (satisfaction) variable has been properly articulated in most participation research.
One particular theoretical criticism has been the reliance on user satisfaction as the key dependent variable [Ives and Olson 1984; Goodhue 1986; Ivivari 1987; Melone 1990]. However, satisfaction measures are more consistent with PDM theory than system usage, financial benefits to the organization, and other alternative measures. Locke and Schweiger [1979], whose review of 89 PDM studies found that participation has been linked more strongly to satisfaction than productivity, supports this position. To date, there is no evidence to suggest that changing the dependent variable would increase the observed impact of participation.

The definition and measurement of the independent variable, participation, is also weak. Participation instruments have not measured the kind of participation envisaged by PDM proponents. For example, Hirschheim [1989, p.196] states that participative system design can be defined as:

"a type of systems development approach where the users take the lead in (and often control of) the development process, and where the substance of development is expanded to include social and organisational concerns, e.g. job design, decision making responsibilities, reporting relationships, and the like."

Instead, most participation measures correspond to the definition of Ives and Olson [1984, p.587], "participation in the system development process by representatives of the target user group."

This definition is vague, has no obvious theoretical foundation, and does not articulate what participation is or what motivates it. Nevertheless, many researchers, and most current textbooks, believe that this general participation ought to be beneficial.

3 Some important contingency variables were not considered

User participation could be more effective under certain conditions than others. McKeen et al. [1994] provide a good review of this literature. But, despite numerous studies of many possible contingency variables (summarized well by McKeen et al. [1994]), only project complexity has been clearly shown to be important.

4 Some participation research has not been published

Pettingell et al. [1988] suggested there could be a "file drawer" problem; studies reporting low or even negative participation-satisfaction relationships have not been published or even submitted. If this is true, then any meta-analysis is incomplete. Pettingell et al. [1988] estimate it would take 10 additional studies with non-significant results before their meta-analysis would conclude that there is no participation-satisfaction relationship. Given the amount of research in this area, 10 such studies might be found. Even if the actual number is smaller, adding them would still weaken the meta-correlation.

5 Conclusions
The basic proposition that user participation plays a substantial role in determining user satisfaction has not been supported in past research. The reason does not seem to lie with methodological flaws or failure to consider contingency variables. While other related constructs, such as psychological involvement or PDM participation, are worthy of study, the central question of participation research is now, "Why does general user participation have such limited impact on outcomes?"

This question deserves an answer.

We need to return to the Ives and Olson [1984] call for a "rigorous conceptual foundation," and particularly their suggestions to consider:

1) determinants of user participation, and
2) characteristics of the participation process, including the type of interaction.

We cannot claim to understand user participation until its determinants have been identified and thoroughly researched.

3. WHY DO USERS PARTICIPATE IN SYSTEM DEVELOPMENT PROJECTS?

The question of why users participate in system development projects was raised some time ago by Swanson [1974, p.186]:

"Given that an individual appreciates the system, what motivates his inquiry and/or a priori involvement? Why does he choose one form of involvement rather than another?" (Italics from the original)

Swanson's questions have rarely been asked since and remain largely unanswered. Most researchers have focused their attention instead on the advantages of participation. PDM theory argues that when users participate, they:

1) provide knowledge of current practices and future needs which are essential to the systems analysis process;
2) develop realistic expectations;
3) increase their commitment to the project;
4) lower their resistance to change; and,
5) increase their ability to work with the system after installation.

Most user participation research appears to assume that high participation users are committed to the success of the project, wish to share in its design and development, and want to learn about how to best use it once the system is completed. But if this were true, the benefits of participation ought to be easily measured.

This section begins with an example of why researchers need to consider the reasons for user participation when constructing measurement instruments. Empirical research on the reasons for participation is then summarized. Although PDM theory advocates that all those affected, directly or indirectly, by the new system be included, this is often a large group with diverse interests. We have chosen to focus instead on participation by the key manager(s) of a project. Powers and Dickson [1973] found their involvement to be much more valuable than participation by
delegated staff personnel. Moreover, managers have more discretion to set their own participation level.

1 Participation Measures

The importance of understanding why users participate can be illustrated by considering possible responses to items in typical user participation measures. As an example, consider the following item from Franz and Robey [1986] which asks users to what extent they agree with the following statement (on a six-point scale ranging from Not at All to Very Much):

!!During the design phase, to what extent did you (or the user group), rather than the analyst, take the initiative (or the lead) to explain or clarify your information needs?

Suppose the manager gives the analyst some direction on information needs and then receives some specifications which are clearly incorrect. Or, even worse, no feedback is received at all. This manager might then "take the initiative," assume more responsibility for requirements definition, and check over the final product much more closely. During this process, she might then have to "explain and clarify" her needs. If questioned, she might respond "Very Much" to the item shown above. The underlying cause of the high participation could be many things, including an analyst with weak skills or communication problems.

Sometimes circumstances force an analyst to divert his attention to higher priority issues elsewhere. Perhaps the manager has a poor grasp of what her unit should be doing, so her initial requirements were incorrect. Some of these problems may be resolved. But, if they are not, the project may have high user participation and an above average probability of project failure.

In contrast, a user with a clear vision working with a highly skilled analyst might agree "moderately" with the statement because duties were shared appropriately. The analyst asked good questions, gathered information from other sources, and put together a well thought-out set of specifications. The user never had to "take the initiative" or "clarify" any major points. So, in this case, there is less user participation in a project with a much better chance of a successful outcome.

This same argument can be repeated with most items in existing user participation measures. For example, is high user participation in project management due to high commitment, organizational policy, or frustration with the analyst's ineptitude? Are high project complexity or uncertainty over goals increasing the need for user input? Unfortunately, past participation research has not distinguished among different

\[2\] For convenience, we are assuming the key manager is a woman and the analyst is a man.

\[3\] Alternatively, the manager may withdraw support and cancel the project. However, canceled projects are rarely included in user participation research.
reasons. In particular, past research fails to distinguish between low participation due to indifference or outright hostility to new systems from the low participation needed when a highly skilled analyst makes efficient use of the manager's time.

2 Research on Determinants of Participation

Few empirical studies have focused specifically on possible determinants of participation. In those which have (summarized in Appendix A), most results have not been statistically significant. As a result, little is known about why users participate. The strongest result, not surprisingly, is that users who want to participate tend to do so [Doll and Torkzadeh 1989]. But we don't understand why they want to participate. In addition, a positive attitude towards participation by IS project managers encourages user participation [Amoako-Gyampah and White 1993]. Both these determinants would seem to generate the type of participation which researchers have had in mind, i.e., activities generally consistent with PDM theory.

More interesting are the inverse relationships found between participation and system planning, at both the organizational [Doll 1987] and project [Amoako-Gyampah and White 1993] levels. Participation also increases with complexity in some studies [Guimaraes et al. 1992, Tait and Vessey 1988], but not in McKeen et al. [1994]. Although most researchers regard user participation positively, few would recommend analysts encourage it by doing a poor job of planning or making a task more complex than necessary.

3 Roles of Participation Determinants

In addition to their effect on participation, some determinants of participation may well have direct effects on outcome variables (such as user satisfaction). These effects can be classified into three types. First, some of the determinants will be neutral, with no direct effect on satisfaction. Other determinants will be positive, affecting both participation and satisfaction in the same direction. If positive determinants predominate, then the observed correlation between participation and satisfaction overestimates the true causal link between them.

Negative determinants are those which affect both participation and satisfaction, but in opposite directions (as shown in Figure 1). Planning, based on results obtained by Doll [1987] and Amoako-Gyampah and White [1993], is most likely a negative determinant. Poor planning increases participation, possibly because the user decides to assume more responsibility for that task herself or because the lack of planning wastes everyone’s time. But poor planning is probably detrimental to the project, thereby reducing user satisfaction. The greater the negative determinants of participation in a sample, the lower the correlation between participation and satisfaction.
An analogous example is often used in introductory statistics classes. There is apparently a positive correlation (not verified by the authors of this paper) between the number of fire fighters attending a fire and the resulting damage. The simplistic conclusion is that we should never call the fire department when we see a fire. The point is that correlation does not imply causation. To understand the correlation, we need to look at the reasons why some fires receive more attention than others. The size of the fire is a negative determinant; large fires attract more fire fighters but also create more damage and, hence, less satisfactory outcomes. Similar reasoning must be applied to user participation.

4. BUILDING A MODEL OF CONTROL PARTICIPATION

While the previous section provides some preliminary support for the existence of negative determinants to user participation, this section provides a theoretical model of Control Participation based on the negative determinants trust and risk.

The theoretical foundation draws on two different sources. The Ring and Van de Ven [1989] Model of Transactions Structure (MTS) comes from research on innovative partnerships across different organizations. The Ouchi [1977, 1980] Control Framework applies to hierarchical relationships within organizations. Admittedly, most user-analyst relationships fall into neither category. But because both theories, drawn from different domains, come to remarkably similar conclusions about the role and importance of

![Diagram of Correlation vs Causal Path Models]
trust, we believe that these conclusions apply to a broad range of organizational relationships including those between users and analysts.

Trust has, until now, been largely ignored in the MIS literature. However, its importance has not been lost on practitioners. Wang [1994, p.97] summarizes it well, "Without trust, everything is friction." He goes on to state:

!!The type of corporate environment we are striving for is built on unprecedented layers of trust: between corporate and technical management, between the company and its partners, between the company and its customers.

A brief explanation of trust and trust building is provided, along with a summary of MIS research which suggests that users may not trust most analysts. This is followed by a discussion of risk in the system development context.

We have chosen to apply these theories from the perspective of the user's trust in the analyst, focusing on senior users within the project team. Participation is a choice that senior users have. They can decide to become involved or they can decide to stay aloof from the project activities. It is our belief that the trust level that the user has in the analyst will influence this decision. While the analyst's trust in the user may influence his own behaviors, it will be the analyst's behaviors (not his trust) that will influence the user's decision to participate. For this reason, we focus solely on the trust that the user has in the analyst.

1 Model of Transactions Structure
FIGURE 2 - MODEL OF TRANSACTIONS STRUCTURE
Ring and Van de Ven [1989] studied organizations which worked together on innovative projects. Innovation can be defined as "developing and implementing a new idea" [Van de Ven and Angle 1989, p.12] and is typically a collaboration which "involves developing and maintaining a variety of cooperative relationships from inside and outside an organization" [Ring and Van de Ven 1989, p.171]. System development projects fit these conditions although, until the recent popularity of outsourcing, the relationships have been largely internal.

The results are summarized in the Model of Transactions Structure (Figure 2). Their key proposition states that [Ring and Van de Ven 1989, p.173]:

"... as risk of a deal increases and trust among parties decreases, an increasingly secure and costly governance structure will be required to motivate parties to enter into a transaction."

When risk is low, neither party requires much trust or verification capability. When risk is high, each party must either trust the other or be able to institute an effective and efficient control system with adequate guarantees. Risky transactions where such controls are not available can only be efficiently executed when transacting partners trust one another.

Innovative transactions have both formal and informal dimensions. Formally, the parties negotiate, come to an agreement, and then administer that agreement. Informally, they go through processes of sense making, understanding, and committing. Ring and Van de Ven [1989, p.174] found that "the greater the congruence between formal and informal processes, the more equitable and efficient the transaction."

These propositions can be specified to provide some insight into systems development projects. Users of IS Departments face a more limited choice of governance structures and safeguards than shown in the MTS, but they do have some options when they perceive a transaction (new system project) to be risky. For example, as a Structural safeguard, users can spend more time on performance specifications and insist they be complete and detailed. As a Procedural safeguard, a user could be the project manager and users could form a majority of the project team membership. Review provisions might include regular progress reports, more frequent meetings, unannounced visits to the analyst, and rigorous acceptance testing. As trust increases, the need for such safeguards (which we label control participation) diminishes.

In terms of system development projects, the Model of Transactions Structure could be restated:

"As risk of a system increases and trust of the systems analyst decreases, the user will engage in increasingly secure and costly control behaviors before entering into and remaining committed to a system development project."
Or, more simply, as risk increases and trust decreases, users participate more.

2 Ouchi's Organizational Control Framework

While MTS applies to transactions involving two or more organizations, Ouchi's [1977, 1980] Organizational Control Framework (shown in Figure 3 as adapted by Eisenhardt [1985]) addresses managerial relationships within an organization. Behavior controls, in which a manager specifies and monitors how a task is performed, are both efficient and effective when task performance is well understood. Similarly, outcome controls, which focus on the end product, are efficient and effective when outcomes can be cheaply, accurately, and promptly measured and are largely controlled by the person performing the task.

![FIGURE 3 - OUCHI CONTROL FRAMEWORK]

For most managers, neither behavior nor outcome controls are easily applied to system development projects. Few managers have the knowledge to employ behavior controls and critical outcomes can only be assessed (and often not easily) when the system is completed and installed. This is too late.

When outcome measurability is low and task programmability is imperfect, the manager faces three options:
- a) absorb high control costs;
- b) abandon these types of transactions; or,
- c) rely on clan control, which is based on building trust.

Users face a similar decision. If they decide to proceed with a project, they can either trust the analyst or engage in costly
and often inefficient monitoring of project progress. Thus, trust and control participation are inversely related.

3 Trust and Trust Building

Trust is a key component of both the Model of Transactions Structure and the Organizational Control Framework. Although trust can be a complex construct to define, a fundamental component is "a willingness to accept incomplete contracting on the assumption that other parties will behave within accepted norms" [Williamson 1975, p.106]. MTS includes both intra-organizational and interpersonal trust, but trust is also part of national or regional culture [Gambetta 1988, Pagden 1988] and business community mores [Macneil 1980, p.74]. Similarly, users will have some level of trust in their organization, the IS Department, and the IS personnel assigned to a project (and these can be quite different). Because we believe the interpersonal trust between the key users and analysts is most critical, our research focuses on this level. We refer to this as a "willingness to depend" on the analyst.

How much one person trusts another is determined in many ways. Some people are inherently more trusting than others. This type of trust predominates early in relationships, but may not be a good predictor of trusting behavior in the longer term [Butler 1983, Driscoll 1978, Golembiewski and McConkie 1975, Heretick 1984, Scott 1980, Worchel 1979]. Similarity between the parties (homophily) also creates early trust, as people tend to trust others like themselves in terms of sex, age, ancestry, ethnicity, race, academic background, etc. [Dalton 1959, Kanter 1977, pp.48-54, Kipnis and Schmidt 1983, Zucker 1986]. Reputation and credentials [Bartolome 1989, Gabarro 1978] are also effective in establishing initial trust.

As parties come to know each better, trust is built through observations of each others' behaviors, qualities, and accomplishments. Trustworthy behaviors and qualities include careful listening, sharing information, keeping promises, being prepared, being respectful of others, being consistent, and demonstrating strong principles that guide behavior [Bartolome 1989, Bennis and Nanus 1985, Fulk et al. 1985, Likert 1967, Margolis and Brannigan 1986, Sinetar 1988]. Communication is particularly important [Giffin 1967, O'Reilly 1978, Roberts and O'Reilly 1974, Wheeless 1978]. Accomplishments also build trust; but, the accomplishments of experts are often difficult for non-experts to evaluate. This is especially true during the developmental phases of a systems project.

Trust is essentially a belief about another, a willingness to depend on that person, even in difficult situations, despite a lack of guarantees or the power to force the desired performance. More specifically, trust requires a shared understanding of the relationship [Ring and Van de Ven 1989] and what is to be accomplished. Trust is fundamentally a belief that someone is well-intentioned and will keep promises made [Barber 1983,

When expertise is required, we trust who we believe have the "competence, technical and interpersonal knowledge and skills required to do one's job" [Butler and Cantrell 1984]. This includes access to needed resources, business skills, care and attention to detail required by the task, and willingness to make the necessary effort [Barber 1983, Bartolome 1989, Gabarro 1978, Koller 1988, Lewis and Weigert 1985, Zaltman and Moorman 1988].

When trust is built, user-analyst relationships change. Trust is a social lubricant. Trust opens communication and increases the sharing of knowledge among project team members [Cooprider and Victor 1993]. Furthermore, trust enables the flexibility of informal contracting which is needed for successful management of complex system development projects [Beath 1987].

In summary, there are four perspectives on trust which provide four ways to operationalize and measure this construct. User Trust in the Analyst is:

1) the result of Analyst Trust Building behaviors and qualities;
2) a set of Beliefs About the Analyst's Trustworthiness, including his understanding of the problem, intentions, and expertise;
3) a Willingness to Depend on the Analyst on important projects; and,
4) demonstrated by the User's Trusting Behavior.

User-Analyst Trust

There are several reasons why users may not have high trust in systems analysts. Given the reality of past failure rates (many systems are not completed or, if completed, not used [Bostrom 1984, Gladden 1982, Reynolds 1988, Turner 1982]) combined with the expectations raised by well-publicized achievements of some successful systems, users have good reason not to trust their IS Department. Smith [1989] found that many do not.

Communication is a key trust builder but the communications gap between analysts and users has been well documented (e.g., Kaiser and Bostrom [1982] and Guinan [1988]). Homophily (or similarity) between parties builds trust, but research shows significant personality differences between users and analysts [Couger and Zawacki 1980, Robey and Markus 1984, Kumar and Bjorn-Andersen 1990]. Reputation builds trust, but IS personnel have high turnover rates and, even within an organization, often move among business units. Performance builds trust but most managers cannot accurately assess the technical accomplishments of systems analysts. They can, however, more easily evaluate general behaviors such as project management skills, communication, thoroughness in exploring the business problem, and responsiveness to user concerns and ideas.
Yet there is an obvious need for trust between users and analysts. Conflict between them has been well documented (e.g., Barki and Hartwick [1994], Robey and Farrow [1982], Robey et al. [1989], and Newman and Noble [1990]). Conflict can be resolved through power, such as influence with senior management (e.g., in the Newman and Noble [1990] case), or tightly defined contracts (as Ring and Van de Ven [1989] discuss). While trust, per se, does not resolve conflicts, it makes the resolution easier and permits more informal (and much less expensive) arrangements.

Of course, there are dangers in trust. A betrayal of trust can happen quickly, with severe consequences. We are not proposing that users simply need to trust analysts and projects will be successful. Instead, we believe that when analysts earn and maintain the trust of users, user control participation decreases and satisfaction with the outcomes is likely to increase. The trust building process is of paramount importance.

5 Risk

How users perceive risk and how risk affects their behavior are questions which have received little attention in the MIS literature. However, research on managerial risk taking in general is well summarized by March and Shapira [1987]. They found that managers tend to see risk not in the financial sense, as a wide range of possible outcomes, but rather as the possibility of some very poor outcomes. When a manager funds, champions, or devotes other resources to a project which fails or produces unexpected problems, her reputation (and possibly career prospects) suffer. Some key indicators of potential poor outcomes are identified in the MTS model, such as uncertainty, size, complexity, interdependence with other systems, and development time (longevity). These components of MTS risk correspond to the McFarlan [1981] definition. When the value of partially completed work to both parties is low (asset specificity), which is typically the case for system projects, the cost of abandoning the project is higher.

March and Shapira also note that managers are more likely to accept risk when they believe they have some control over the dangers. The remaining MTS risk factors make managerial control more difficult. When the user has limited IS experience and expertise (bounded rationality), the analyst and user have quite different experience and expertise from each other (information asymmetry), and the analyst may take advantage of the situation to satisfy personal objectives (opportunism), the manager must devote more attention to the project in order to feel in control.

In a worst case scenario, the result is "crippling high costs of surveillance, complete contracting, and enforcement in order not to be cheated" [Ouchi 1977, p.838].

As with trust, both Risk factors, Poor Outcomes and Lack of Control, should tend to have opposite impacts on participation and outcomes. Risky projects, which are those with potentially poor outcomes, inherent difficulties, and less knowledgeable
users, ought to generate less satisfaction than safer, easier projects with experienced users. But risky projects may also attract greater managerial participation, in order to provide that desired sense of control. Thus, risk should be a negative determinant with opposite effects on participation and outcomes.

While Tait and Vessey [1988] found only a weak (non-significant) inverse relationship between complexity and system success, this may be because the complex projects receive greater resources including more experienced analysts. Ceteris paribus, risk factors should significantly reduce outcome quality.

6 Summary

This section has proposed an alternate theory of user-analyst relationships. The Control Participation Model, showing the role of Trust and Risk in determining User Participation is contained in Figure 4. This is an incomplete model of participation; we do not expect trust and risk to determine the majority of user participation behavior. Other important determinants of User Participation exist and most are probably neutral (as shown) or positive in their effect on User Satisfaction. They must be properly defined in a theoretical context and then added to the model.

FIGURE 4 - CONTROL PARTICIPATION MODEL
The weak observed relationship between User Participation and User Satisfaction suggests that research samples have contained both high participation-low satisfaction and low participation-high satisfaction projects. The Control Participation Model provides an explanation for why both types of projects exist. When analysts appear untrustworthy and the project is relatively complex for the user, Control Participation increases. But most users lack the skills to substitute effectively their time for that of the analyst. So, if the relationship does not change, there is a good chance of high participation and poor outcomes.

On the other hand, users working with highly trusted analysts on relatively simple projects engage in very little Control Participation. But, if their perceptions are correct, there is a good chance of project success. The relationship between participation and satisfaction can only be understood when the different motivations for participation are properly understood and incorporated into research models.

5. RESEARCH METHODOLOGY

The Control Participation Model uses new construct definitions and thus requires new instruments to properly test it. Some trust instruments have been published, but none apply well to user-analyst relationships. Project risk has been measured [McFarlan 1981], but there are no instruments to measure the outcome risks (discussed in Section 4.5) in an MIS context. Participation measures need to be re-considered, to ensure that they correspond to Control Participation, PDM participation, or some other well-defined construct in a theoretical context. Developing all these new instruments in a single study would be prohibitively complex. As a starting point, we chose to focus on defining and measuring user trust of analysts.

The research began with interviews of 17 managers and 17 systems analysts from 15 organizations. We asked our organization contacts, usually a senior manager in the IS area, to identify:

a) managers with considerable experience working with systems analysts, and
b) analysts who had a good reputation for building relationships with users.

The interviews focused on the concept of trust, including questions on what trust means, how trust is built and lost, and what impact trust has on projects.

Based on the interviews and the trust literature, a 100-item questionnaire was constructed. The primary goal of this phase was to develop valid measures of user trust in analysts. The distribution of items in shown in Table 1.

Trust is measured in four ways. First, the user is asked to evaluate the analyst's Trust Building behaviors (e.g., meeting deadlines and keeping users informed). Second, the user is asked about her Beliefs About the Analyst's Trustworthiness (e.g.,
competence, intentions, and understanding. Third, the user is asked about her Willingness to Depend on the analyst in critical situations. Fourth, the user is asked about her current and intended Trusting Behavior (e.g., willingness to be communicate openly and level of planned testing).

User participation is measured using an instrument adapted from Franz and Robey [1986]. Six Risk items were included to explore concepts such as uncertainty, complexity and project impact.

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<table>
<thead>
<tr>
<th>Number of Items</th>
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<tbody>
<tr>
<td>User's Perception of Trust Building</td>
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<tr>
<td>User's Belief in the Analyst's Trustworthiness</td>
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<tr>
<td>User's Trust in the Analyst (Willingness to Depend)</td>
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<tr>
<td>User's Trusting Behavior</td>
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<tr>
<td>User's Perceived Risk</td>
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<tr>
<td>User Participation</td>
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<tr>
<td>Other</td>
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<td>Total Items</td>
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**TABLE 1 - QUESTIONNAIRE ITEMS**

The questionnaire was distributed to 162 key users in 15 organizations. The user was asked to think of the "lead analyst" when responding. Unlike most previous studies, which relied on retrospective data, the users were currently working with the analyst on a system development project. There were 113 responses, of which 104 were usable (a 64% net response rate). While respondents could be anonymous, the organization name was prominently displayed on the first page and the names of the project, respondent, and lead analyst were requested. Most provided this information. Data on the outcomes of these projects has yet to be collected.

**6. INTERVIEW RESULTS**

During the interviews, managers were asked what they would do if they did not trust their analyst. Some said they would get a new analyst or, failing that, cancel the project. But most talked about additional control behaviors. Some said they would consult with other experts, such as more experienced colleagues or other analysts in the IS Department. They talked of going
over specifications more carefully, even doing "all the thinking for myself." They would manage the project more closely, "checkpointing the effort and making sure the job is being done ... correctly." While testing is always necessary, managers talked of "retesting" and "fine tooth combing it" when the analyst was not trusted.

Many managers mentioned the cost of this additional participation. First, there is the time required. Low trust is "more expensive for the company, two people's time." But there is also the uncertainty, "I don't like the fact that a lot of time you just don't know what you need to prepare and what you need to do for the project." Second, low trust relationships are unpleasant for the participants. "There's just tension. Meetings are definitely shorter." Instead of resolving issues properly, team members get frustrated and take an "I-don't-care attitude." Considerable time is spent finding fault with others. One manager summed it up as, "It increases the stress level and you dread working on the whole thing. It's real hard."

The interviews clearly supported the research model and, in particular, the hypothesis that some participation is due to a lack of trust. The interviews also provided ideas for many of the items in the questionnaire. (Appendix B provides the wording for all items used in this paper along with the seven-point Likert response scale.)

7. QUESTIONNAIRE RESULTS

Analyst behaviors, qualities or performance identified in the trust literature and interviews as key builders (or destroyers) of trust were used to generate 42 Analyst Trust Building items. A factor analysis was run on 29 of these items. (The remainder could not be included due to non-response rates. For example, not all users see project cost figures so they could not comment on whether target costs had been met.) A six-factor solution was generated. Two of the factors have weak alpha values but will be retained due to the exploratory nature of this research. For all instruments, items are weighted equally. (The results are summarized in Table 1 and the items used in each measure are listed in Appendix B).

A similar analysis of the 19 User's Beliefs in the Analyst's Trustworthiness items yielded three factors. Although beliefs in another's intentions is fundamental to trust, the analysis did not generate an intentions factor. One possible reason is that users terminate relationships when the analyst's intentions are suspect. For example, only seven respondents agreed that the analyst was "following a personal agenda that is in conflict with the project goals."
One item was dropped from each of the Willingness to Depend and User's Trusting Behavior measures based on a review of Cronbach alpha values. Both measures yield a single factor.

The six items exploring the User's Perceived Risk address a variety of issues. Only one cohesive factor, based on the Consequences of Failure (e.g., impact of project failure on the user's career), was generated and it has a weak Cronbach alpha score of 0.58.

The six items measuring User Participation were adapted from Franz and Robey [1986]. While the Cronbach alpha is marginal at 0.70, the instrument is representative of past participation measures.

<table>
<thead>
<tr>
<th></th>
<th>No of Items</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Cronbach Alpha</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust Building</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Management</td>
<td>5</td>
<td>5.25</td>
<td>1.11</td>
<td>0.85</td>
<td>92</td>
</tr>
<tr>
<td>Problem Analysis</td>
<td>3</td>
<td>5.28</td>
<td>0.88</td>
<td>0.59</td>
<td>97</td>
</tr>
<tr>
<td>Team Building</td>
<td>4</td>
<td>5.20</td>
<td>1.22</td>
<td>0.87</td>
<td>93</td>
</tr>
<tr>
<td>Communication</td>
<td>7</td>
<td>5.36</td>
<td>0.95</td>
<td>0.89</td>
<td>91</td>
</tr>
<tr>
<td>Support for User</td>
<td>7</td>
<td>5.53</td>
<td>1.05</td>
<td>0.89</td>
<td>92</td>
</tr>
<tr>
<td>No Serious Breaches</td>
<td>3</td>
<td>5.62</td>
<td>1.06</td>
<td>0.73</td>
<td>98</td>
</tr>
<tr>
<td>Beliefs about Trustworthiness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competence</td>
<td>5</td>
<td>5.72</td>
<td>1.09</td>
<td>0.86</td>
<td>101</td>
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<tr>
<td>Respects Confidentiality</td>
<td>2</td>
<td>5.57</td>
<td>1.12</td>
<td>0.74</td>
<td>88</td>
</tr>
<tr>
<td>Shared Understanding</td>
<td>3</td>
<td>5.29</td>
<td>1.19</td>
<td>0.80</td>
<td>102</td>
</tr>
<tr>
<td>Willingness to Depend</td>
<td>6</td>
<td>5.47</td>
<td>1.48</td>
<td>0.97</td>
<td>102</td>
</tr>
<tr>
<td>Trusting Behavior</td>
<td>3</td>
<td>5.30</td>
<td>1.15</td>
<td>0.76</td>
<td>94</td>
</tr>
<tr>
<td>Risk (Consequences)</td>
<td>3</td>
<td>5.62</td>
<td>0.94</td>
<td>0.58</td>
<td>99</td>
</tr>
<tr>
<td>User Participation</td>
<td>6</td>
<td>4.68</td>
<td>0.96</td>
<td>0.70</td>
<td>84</td>
</tr>
</tbody>
</table>

The sample size shows the number of respondents who provided a usable response to all items in the construct measure. Sample sizes are further explained in Appendix B.

TABLE 2 - RESEARCH INSTRUMENTS
1 Trust Measures

Table 2 shows that users tend to trust analysts. The mean trust levels are much higher than the level of user trust in the IS Department reported by Smith [1989]. One explanation is that trust is more easily built at the individual level. Another came from the organizational contacts, who reported that:

1) relationships between users and analysts have improved substantially in recent years; and

2) some users who were known not to trust IS had refused to participate in the study.

Finally, there were also several organizations which declined to participate, generally stating the topic was too sensitive. Thus, participating organizations may have higher trust levels than the overall average.

2 Trust and User Participation

All 11 trust measures have the expected inverse relationship with User Participation, with Team Building, Project Management, User's Trusting Behavior, Perceived Competence and Perceived Understanding statistically significant at the 0.01 level (Table 3).
<table>
<thead>
<tr>
<th></th>
<th>No Ser Brch</th>
<th>Communication</th>
<th>Project Mgt</th>
<th>Support</th>
<th>Team Building</th>
<th>Competence</th>
<th>Confidential</th>
<th>Understands</th>
<th>Dependable</th>
<th>Tr Behavior</th>
<th>Consequences</th>
<th>Participation</th>
<th>PA Breach</th>
<th>Comm ProjMgt</th>
<th>Support TeamBld Compet Confid Unde:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Ser Brch</td>
<td>0.29*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>0.50**</td>
<td>0.62**</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Mgt</td>
<td>0.45**</td>
<td>0.48**</td>
<td>0.67**</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Support</td>
<td>0.33**</td>
<td>0.64**</td>
<td>0.74**</td>
<td>0.62*</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Team Building</td>
<td>0.46**</td>
<td>0.51**</td>
<td>0.69**</td>
<td>0.67**</td>
<td>0.70**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competence</td>
<td>0.47**</td>
<td>0.57**</td>
<td>0.69**</td>
<td>0.71**</td>
<td>0.65**</td>
<td>0.69**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidential</td>
<td>0.09</td>
<td>0.62**</td>
<td>0.42**</td>
<td>0.29*</td>
<td>0.48**</td>
<td>0.49**</td>
<td>0.38**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Understands</td>
<td>0.18</td>
<td>0.41**</td>
<td>0.60**</td>
<td>0.45**</td>
<td>0.73**</td>
<td>0.61**</td>
<td>0.59**</td>
<td>0.45**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependable</td>
<td>0.42**</td>
<td>0.59**</td>
<td>0.75**</td>
<td>0.59**</td>
<td>0.74**</td>
<td>0.72**</td>
<td>0.84**</td>
<td>0.51**</td>
<td>0.74**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tr Behavior</td>
<td>0.35**</td>
<td>0.55**</td>
<td>0.67**</td>
<td>0.67**</td>
<td>0.76**</td>
<td>0.68**</td>
<td>0.79**</td>
<td>0.48**</td>
<td>0.79**</td>
<td>0.74**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consequences</td>
<td>0.10</td>
<td>0.11</td>
<td>0.08</td>
<td>0.01</td>
<td>-0.08</td>
<td>-0.06</td>
<td>-0.04</td>
<td>0.04</td>
<td>-0.20</td>
<td>-0.06</td>
<td>-0.19</td>
<td>-0.40**</td>
<td>-0.21</td>
<td>-0.41**</td>
<td>-0.30* -0.14 -0.23*</td>
</tr>
<tr>
<td>Participation</td>
<td>-0.20</td>
<td>-0.06</td>
<td>-0.19</td>
<td>-0.40**</td>
<td>-0.21</td>
<td>-0.41**</td>
<td>-0.30*</td>
<td>-0.14</td>
<td>-0.23*</td>
<td>-0.20</td>
<td>-0.19</td>
<td>-0.40**</td>
<td>-0.21</td>
<td>-0.41**</td>
<td>-0.30* -0.14 -0.23*</td>
</tr>
</tbody>
</table>

Minimum pairwise N of cases: 91

1-tailed Signif: * - 0.01** - 0.001

** TABLE 3 - CORRELATION MATRIX **
Regression analysis must be used carefully. A high level of multicollinearity should be expected, given the nature of the variables. Rather than attempting to identify the importance of individual variables, the analysis examined the effects of the variables in sets. With all 11 variables forced to enter, the Trust measures predict User Participation with an adjusted R-square of 0.21. Trust Building alone provides the largest adjusted R-square of any of the four measures, also 0.21 (with all six variables forced to enter the equation). The remaining measures do not add significant additional predictive power, individually or collectively.

Not only is Trust Building the best predictor of User Participation, but it should also provide the most useful insights for practitioners. Trust Building behaviors and qualities are more controllable by the analyst than user beliefs.

<table>
<thead>
<tr>
<th>Promote a positive team atmosphere</th>
<th>All Respondents</th>
<th>Low Trust Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail to meet target dates without explanation</td>
<td>0.42**</td>
<td>0.65**</td>
</tr>
<tr>
<td>Improve the productivity of project team meetings</td>
<td>-0.37**</td>
<td>-0.75**</td>
</tr>
<tr>
<td>Provide a detailed plan of what is to be done, by who, when</td>
<td>-0.35**</td>
<td>-0.54*</td>
</tr>
<tr>
<td>Make useful suggestions on how the new system should work</td>
<td>-0.31**</td>
<td>-0.54**</td>
</tr>
<tr>
<td>Hold meetings with clear expectations</td>
<td>-0.31*</td>
<td>-0.49*</td>
</tr>
<tr>
<td>Avoid working beyond normal hours</td>
<td>0.30*</td>
<td>0.56*</td>
</tr>
<tr>
<td>Ask probing questions about what the users do, and why and how they do it</td>
<td>-0.29*</td>
<td>-0.44*</td>
</tr>
<tr>
<td>Display genuine enthusiasm for the project</td>
<td>-0.29*</td>
<td>-0.55**</td>
</tr>
<tr>
<td>Promise to followup but fail to do so</td>
<td>0.29*</td>
<td>0.50*</td>
</tr>
<tr>
<td>Inform users of general project status</td>
<td>-0.28*</td>
<td>-0.40</td>
</tr>
<tr>
<td>Inform users in advance of anticipated problems</td>
<td>-0.26*</td>
<td>-0.42</td>
</tr>
<tr>
<td>Give users system descriptions or components containing errors the analyst should have detected</td>
<td>0.26*</td>
<td>0.42</td>
</tr>
<tr>
<td>Ensure complete, well maintained documentation is kept</td>
<td>-0.26*</td>
<td>-0.37</td>
</tr>
<tr>
<td>Help user add system features</td>
<td>-0.25*</td>
<td>-0.34</td>
</tr>
</tbody>
</table>

1-tailed significance: * - 0.01, ** - 0.001
Minimum pairwise number of cases: All respondents 82, Low Trust Respondents 24

**TABLE 4 - ANALYST BEHAVIORS MOST HIGHLY CORRELATED WITH USER PARTICIPATION**

Of the 42 Analyst Trust Building items, 15 have a statistically significant (0.01 level) relationship with User Participation and are shown in Table 4 (with abbreviated wordings). All show the predicted inverse relationship. Those with negative correlations would normally be considered good practices while the four with positive correlations, such as...
failing to meet target dates without an explanation, appear undesirable and are reverse-scored items (marked as "(R)" in Appendix B). Of the remaining 27 trust building items, 24 have a direction consistent with the theory. Only "respecting confidentiality of material" (0.00), "challenging the user's answers to spot gaps and inconsistencies" (0.04), and "having strong academic credentials" (0.21) run contrary to the theory. (Because the first two ought to encourage participation, the lack of negative correlations is not surprising.) When only those users below the median on the Willingness to Depend measure are included, the correlations become substantially stronger (Table 4). This result is consistent with the theory.

3 Consequences of Failure and User Participation

The three-item Consequences of Failure variable is positively correlated with User Participation, as predicted, but the correlation is not statistically significant. However, one of the three items, which asked whether the user's "reputation and career opportunities will be damaged if this systems project fails," produced a statistically significant correlation with participation (0.43, significant at the 0.001 level).

When the Consequences of Failure measure is added to the six Trust Building factors as an independent variable to predict User Participation, it increases the adjusted R-square value from 0.21 to 0.26. Moreover, Consequences of Failure is a significant variable at the 0.01 level. While this research has failed to fully support the link between Risk and User Participation, more work is clearly needed in this area before the model could be rejected.

4 Interaction Between Risk and Trust

No relationship is hypothesized between the User's Perceived Risk and trust and only weak relationships were found. When regression is used to test for interaction effects between each Trust measure and Consequences of Failure, only Shared Understanding (at 0.08) produced an effect significant at the 0.10 level.

Moreover, the largest magnitude correlation between the six Risk items and User Trust is only -0.13 and, with the six Trust Building factors, 0.19. None are significant at the 0.01 level.

Only two of the 42 Analyst Trust Building items are significantly correlated with the Reputation/Career Risk item (which had the strongest relationship with User Participation), both at 0.28 (0.01 level).

Nor does it appear that the Risk moderates the relationship between trust variables and User Participation. When only high risk users are analyzed, the correlations between User Trust and the six Trust Building factors are only slightly lower than when all users are included.

5 Summary

The results provide solid support for the proposed Model of Control Participation, based on the Structural Model of
Transactions and Organizational Control Theory. First, several measures of Trust show a significant inverse relationship to User Participation.

Second, there is some reason to believe that Risk (particularly Personal Risk to career and reputation) also influences User Participation as predicted by the MTS. Moreover, Trust and Risk are relatively independent. While this study focused on developing trust measures, a similar effort is needed to build validated measures of perceived risk.

Third, the results clearly show that past participation research results need to be reinterpreted. The reasons for User Participation must be considered when attempting to explain the relationship between User Participation and User Satisfaction (or other outcome variables). A significant amount of User Participation is caused by low trust which, in turn, is caused by the failure of the analyst to perform important parts of his job. The analyst's poor performance is very likely to reduce the chances of User Satisfaction while simultaneously increasing User Participation. This paper thus provides a theoretical explanation for the modest participation-satisfaction relationships reported in past research.

8. CONCLUSIONS AND RESEARCH IMPLICATIONS

This paper offers a fresh perspective on the role of user participation in determining system project outcomes. The three key contributions are:

1) a new theoretical foundation which explains some user participation behavior, its determinants, and its consequences;
2) some empirical support for the new theory; and,
3) an explanation for why past participation research has not found a stronger relationship between user participation and user satisfaction.

The Control Participation Model opens up important new research opportunities. First, we need to further develop and sharpen the instruments used in this study. Neither Control Participation nor Risk are adequately measured and the Trust measures should be refined.

Second, we need to improve our understanding of what participation means and what produces it. Control Participation is just one type. PDM Participation may be another. Each type of participation must be defined both in terms of the behaviors involved and the reasons for those behaviors. For example, when a user serves as project leader as part of a well-developed PDM process the result may be very different from when a user takes over the leadership role out of frustration with the analyst's incompetence in this role.

Third, research is needed to improve our understanding of how different forms of participation affect project outcomes. Much of the considerable literature on user participation is of no benefit whatever to practitioners. The basic finding, that
participation is less important than expected, has been largely (and, we believe, correctly) ignored in system development textbooks. We need to identify what types of participation are most effective in which circumstances and how these participation behaviors can be encouraged.