THE RESPECTIVE ROLES OF USER PARTICIPATION AND USER INVOLVEMENT IN INFORMATION SYSTEM IMPLEMENTATION SUCCESS

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ABSTRACT

Consistent with the conceptualizations of participation and involvement in psychology, organizational behavior, consumer behavior, and other disciplines, this paper redefines the participation construct to distinguish its behavioral and psychological dimensions. "User participation" is defined as the *observable behavior* of information system users in the information system development process; "user involvement" as a need-based attitude or *psychological state* of users with regard to that process and to the resultant information system; and "user engagement" as the set of user behaviors and attitudes toward information systems and their development.

A field study was conducted in a $40 billion interstate bank during the installation and conversion of an information system. A questionnaire was developed, pre-tested, and validated for internal consistency, temporal stability, factorial validity, and multicollinearity. Path analysis was used for theory testing (i.e., model comparison).

There was strong empirical evidence to support: (1) that user involvement is something distinct from, although associated with, user participation; (2) that this psychological state of user involvement may be more important than user participation in understanding information system success; (3) that the behavioral-attitudinal theory of information system success (i.e., that participation "causes" involvement which mediates the participation-success relationship) is superior to the behavioral theory (i.e., participation "causes" success); and (4) that user engagement during the installation phase is strongly associated with user satisfaction.

1. INTRODUCTION

The primary focus of this research is on the participation (both behaviorally and psychologically) of information system users in the information system development process. Information system researchers have directed a great deal of attention to the participation of system users in the information system development process. Although "it is almost an axiom of the MIS literature that user...[participation] is a necessary condition for successful development" (Ives and Olson 1984, p. 586), the empirical research has generally produced mixed results.

This inconsistency has been attributed primarily to methodological problems (Ives and Olson 1984; Franz and Robey 1987). Yet even recent studies, which are more methodologically sound, have indicated a positive but relatively weak relationship between user participation and information system success (e.g., Baroudi, Olson, and Ives 1986; Franz and Robey 1986; Tait and Vessey 1988; Doll and Torkzadeh 1989). This suggests that the relationship between the participation of users in the information system development process and the success of the developed information system is either not particularly important, or that there are possibly moderating and/or intervening variables that are important to this relationship which have not as yet been identified.

Almost without exception, this prior research has been concerned with the participative behaviors engaged in by users during the process of information system development. The possibility of a psychological dimension of this participation in system development activities has been addressed (usually implicitly) by only a few researchers (e.g., Ginzberg 1981; Baronas and Louis 1988; Doll and Torkzadeh 1989). When the participative behaviors of system users were coupled with their need-based attitudes (e.g., Franz and Robey 1986; Baronas and Louis 1988; Doll and Torkzadeh 1989), the relationship of user participation and information system success appeared to be stronger than when information system researchers operationalized

the participation construct in purely behavioral terms (e.g., Baroudi, Olson, and Ives 1986).

This suggests that a theory of information system success which explicitly includes the attitudinal dimension of a user's engagement in the information systems development process would be superior to a theory which attempts to predict information system success on the basis of the behavioral dimensions of that engagement alone.

2. PARTICIPATION AND INVOLVEMENT DEFINED

Following the suggestion of Barki and Hartwick (1989), the term "user participation" is defined as the *observable behavior* of system users in the information system development process, i.e., their participation in information system development and implementation activities. On the other hand, "user involvement" is defined as a need-based mental or *psychological state* of system users, i.e., their attitude toward the development process and its product (that is, the information system itself). This conceptualization of involvement is consistent with the use of the construct in other disciplines (Kanungo 1982; Barki and Hartwick 1989). Finally, the term "user engagement" is used to refer to the total set of user relationships toward information systems and their development. User engagement thus includes both user participation (the behavior) and user involvement (the attitude).

The term "involvement" refers to a particular attitude characterized as a "state of psychological identification with" some object (Kanungo 1979, p. 131), such that the object is "both important and personally relevant" (Barki and Hartwick 1989, p. 31). This psychological state of involvement is a function of one's perception of the "need-satisfying potentialities" of the object (Kanungo, p. 131). This approach to involvement "is characterized as a motivational one...[and] uses the existing motivational language" (p. 130) and theories of human motivation (Maslow 1943, 1954; Herzberg 1968; Lawler 1973).

Specifically, it was the purpose of this research to examine the possibility of this need-based psychological component, user involvement, intervening in the user participation-information system success relationship. Restated, it was the primary purpose of this study to determine empirically if user participation (i.e., a behavior) in the process of information system development and implementation induces a psychological state (i.e., user involvement) which intervenes in, and thus influences, the participation-success relationship.

3. THE THEORY TO BE TESTED

The theory of information system development of interest to this research project is shown in Figure 1. This model, at least since it was promulgated by Swanson (1974), is the essence of the partial theory of information system development which has been central to most of the research concerning user participation and information system development success. An examination of that research and the development of models by both Zmud (1979) and Ives and Olson (1984) indicates that Figure 1 does represent the postulated relationship of participation and success found in that body of research.

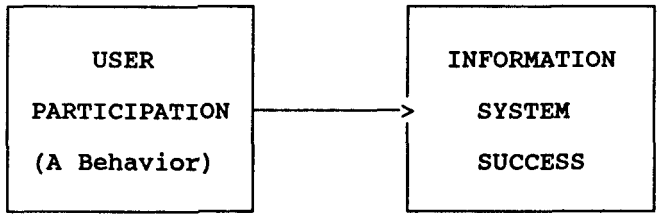

Figure 1 The Behavioral Theory of IS Success

Moreover, this model represents the heart of the theories tested in the subsequent user participation-information system development success research (e.g., Baroudi, Olson, and Ives 1986; Franz and Robey 1986; Tait and Vessey 1988; Doll and Torkzadeh 1989). However, this research suggests that this behavioral theory, although simple, clearly does not have very much predictive power (Barki and Hartwick 1989). In an attempt to correct this deficiency, this study proposed a refinement of the behavioral theory shown in Figure 1. Figure 2 represents this modification.

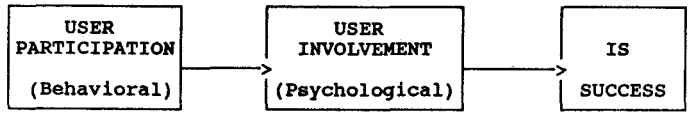

Figure 2. The Behavioral-Attitudinal Theory of IS Success

The model depicted in Figure 2 posits a behavioral and attitudinal explanation of information system success. It hypothesizes that the addition of a need-based psychological component, user involvement, increases the predictive power of the behavioral theory. Empirically speaking, the question is a matter of which model, the behavioral model (Figure 1) or the behavioral-attitudinal model (Figure 2), better fits the data regarding these phenomena. It is acknowledged that the relationships may be more complex than indicated and may include multi-directional associations. Specifically, it was hypothesized that:

H1: The behavioral-attitudinal model (Figure 2) will "explain" information system success better than the behavioral model (Figure 1).

4. THE CONDUCT OF THE STUDY

A fortuitous opportunity enabled this research question to be tested in a field study of an information system implementation at 52 branches of a $40 billion regional interstate bank holding company. The bank provided an opportunity to study the relationships among the three variables of interest during the installation and conversion of the information processing sub-system at each of the branches.

This installation phase is an under-studied aspect of the information system development life cycle (Kappelman 1990). Moreover, the situation was such that the information system under development was already a proven success at other branches, at least in terms of meeting technical and organizational requirements. Operational for more than five years, the system was in place at over 600 branches in five Southeastern states. This fact enabled this study to focus on the people and the process of information system development rather than on the information system itself.

The research instruments were pre-tested and calibrated with data collected during a two-week period prior to the weekend of system cutover. Primary data were then collected during a four-week period which began approximately one month after cutover to the new information system. The response rates for the two data collections were relatively comparable, especially when adjusted for employee turnover (i.e., 33.5% and 30.6% respectively). The entire user population (n = 512) was polled for the primary data collection and these were the data used for testing the theory.

5. MEASUREMENTS

Considerable effort was invested in the development and validation of the measurements of the three constructs of primary interest to this research. A questionnaire was developed (Dillman 1978) and the measures were pre-tested and validated for internal consistency (Cronbach 1951; Nunnally 1978), temporal stability (Crano and Brewer 1973), factorial validity (Kaiser 1960; Blau 1985, 1988; Straub 1989), and multicollinearity (Churchill 1975; Neter, Wasserman, and Kutner 1985). Some of the key questionnaire items are listed in the Appendix. For a more complete discussion of the development of these measures, see Kappelman (1990).

5.1 User Participation

The user participation construct was operationalized with twenty-three specific questions followed by a five-choice Likert-type response scale. Since most of the subjects participated only in system installation and conversion activities, a linear sum was derived utilizing only the thirteen "later phase" participation items. The response scale was similar to that used by Franz and Robey (1986). The derivation of these user participation items was based primarily on the work of Olson and Ives (1980, 1982) and Baroudi, Olson and Ives (1986). The Cronbach alpha coefficient for the thirteen items was .84 (n = 146). Since user participation is a visible behavior rather than an invisible attitude, and the goal of this research was an assessment of the quantity of participation, the unidimensionality of this thirteen-item scale was not considered requisite to its valid use. A varimax rotation suggested three underlying dimensions to the scale.

5.2 User Involvement

The user involvement construct, actually the user's involvement in the information system itself, was operationalized by Zaichowsky's (1985) "Personal Involvement Inventory." This instrument was developed "to measure a person's **involvement** [emphasis added] with products" (p. 349). There is "strong evidence of reliability and validity" for this instrument (Barki and Hartwick 1989), although its unidimensionality has been questioned (Kappelman and Seitz 1991). Moreover, like Kanungo's (1979, 1982) job involvement definition, this construct is a need-based one.

The instrument consists of an object statement followed by twenty bipolar adjective pairs and a seven-choice response scale situated between them. In order to control for factorial validity and collinearity, a sum derived from factor scores of fourteen of these twenty items was utilized for theory testing. Cronbach's alpha was .92 for these fourteen items (n = 143). The scale had three principal components with eigenvalues greater than one and a range of factor loadings from 46 to 85 on the first component, which accounted for 52.2% of the variance in the scale and was 5.1 times larger than the second factor.

5.3 Information System Success

The need to evaluate information system success has been recognized by information system researchers (e.g., Lucas 1972; Powers and Dickson 1973). Two of the most commonly utilized methods of evaluating information system success are user satisfaction and system use (Ginzberg 1979; Melone 1990), the latter being employed when use is discretionary. Of these two methods, user satisfaction seems the preference of most information system researchers, especially when, as was the case in this study, information system use is mandatory (Ives, Olson, and Baroudi 1983; Swanson 1987; Miller 1989; Melone 1990).

In the organizational effectiveness literature, individual assessments of satisfaction, both as an overall construct and with respect to its various facets, are recognized as a legitimate assessment metric (Cook et al. 1981). Although

it is problematic to discuss information system success without taking organizational success into consideration (Swanson 1987), such organizational effectiveness is of secondary interest here.

In the information system literature, individual assessments of user satisfaction are recognized as a legitimate, albeit partial, effectiveness metric with regard to information systems (Dickson, Wells, and Wilkes 1986; DeLone and McLean 1989). Admittedly, it is possible that one could have an ineffective information system which was widely used by satisfied users. Nevertheless, user satisfaction was used here as the dependent variable because it is a legitimate, widely used, individual assessment, suitable for non-discretionary situations, and it facilitates comparisons with prior research (e.g., Swanson 1974; Ives, Olson, and Baroudi 1983; McKeen 1983; Franz and Robey 1986; Baronas and Louis 1989).

The measurement of the user satisfaction construct was built on the work of Powers (1971), Powers and Dickson (1973), Bailey and Pearson (1983), Ives, Olson, and Baroudi (1983), Ein-Dor and Segev (1986), Baronas and Louis (1988), as well as others. The measurement consisted of 17 individual items, the last of which was an overall user satisfaction measure (Powers 1971; McKeen 1983; Baronas and Louis 1988; Galletta and Lederer 1989). A five-choice Likert response scale was provided. Cronbach's alpha for the seventeen-item scale was .89 (n = 146). The issues of unidimensionality and item-homogeneity were considered critical to the validation of this attitude scale (Crano and Brewer 1973; Scarpello and Campbell 1983; Galletta and Lederer 1989). An analysis was conducted to determine if a factorially-valid measurement of user satisfaction could be established from these seventeen items. The results did not suggest a unidimensional scale.

> [When] item heterogeneity remains a problem, the summing of detailed, independent items to obtain a global measure of user satisfaction is invalid. If researchers desire a global measure, a global question would be more appropriate (Galletta and Lederer 1989, p. 433).

Moreover, it seems that such "summary questions are more reliable than detailed questions" (p. 430). This parallels the findings of Scarpello and Campbell (1983, p. 595), who "argue against the common practice of using the sum of facet satisfaction as the measure of overall job satisfaction."

Until more is known about the dimensions of a user's satisfaction with an information system, i.e., what those dimensions are and how to measure them, it appears that the most reliable and valid way to operationalize the global user satisfaction construct is with an overall user satisfaction question (see Appendix). Incidentally, this single question had a significant Pearson correlation coefficient (.79, n = 142) with a linear sum of the other sixteen user satisfaction items ($p < .0001$), as well as with each of the other sixteen items (all values were < .001).

5.4 A Note Regarding the Difference Between Satisfaction and Involvement

Both satisfaction and involvement are attitudes. User satisfaction is defined as the degree to which users have a positive *affective* orientation toward an information system; i.e., the extent to which they feel good about it. This parallels the job satisfaction construct with regard to employment (Cook et al. 1981; Price and Mueller 1986). "'Feel' is a term often used in place of satisfaction" (p. 216). On the other hand, user involvement is defined as the degree of psychological identification users have toward an information system, i.e., the *subjective* degree to which they consider it to be personally important. In the psychological, marketing, and organizational behavior literatures, "involvement is consistently defined as a subjective psychological state, reflecting the importance and personal relevance of an object" (Barki and Hartwick 1989, p. 61).

Involvement and alienation are opposite ends of the same concept, notes Kanungo (1979, 1982). He defines involvement as a "cognitive belief state" or "psychological identification" clearly distinct from the "affective state" of satisfaction (pp. 75-77). The independence of the involvement and satisfaction constructs has been indicated empirically (e.g., Lawler and Hall 1970; Brooke, Russell and Price 1988). In this project, several varimax-rotated factor analyses of the participation, involvement, and satisfaction scales strongly indicated that these three constructs had been operationalized distinctly.

6. THEORY TESTING

6.1 A Strategy for Theory Testing

The method of analysis employed here to determine if the theories proposed were consistent with the data was path analysis (Wright 1923; Pedhauzer 1982). The use of path analysis herein was limited to recursive models which, by definition, have a uni-directional flow of causation (e.g., Figures 1 and 2). Two types of recursive causal models are of interest here.

A model is called *just identified* (or *fully recursive*) when all of the variables are interconnected. A fully recursive model will always reproduce the correlation matrix (R) and perfectly fit the data regardless of how questionable the causal model may be; therefore, "just-identified models cannot be tested" (Pedhauzer 1982, p. 616). On the other hand, it is with "overidentified models," in which some of the paths have been restricted or constrained, "that one may use the reproduction of R for the purpose of assessing the validity of a causal model" (p. 597). The restriction of interest to this research was that certain path coefficients were equal to zero, i.e., that there were no direct effects.

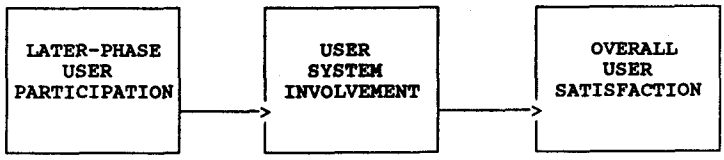

Figure 3. The Behavioral-Attitudinal Theory (Restricted)

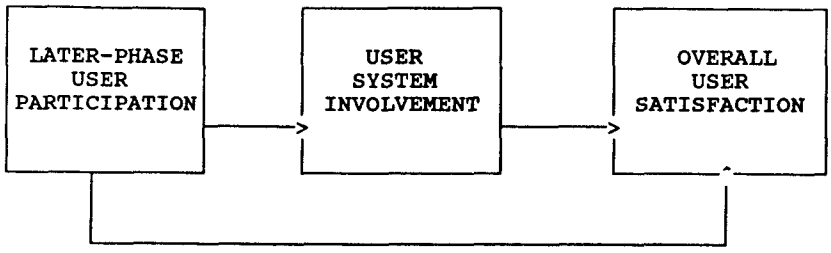

Figure 4a. Behavioral-Attitudinal Model (Fully Recursive)

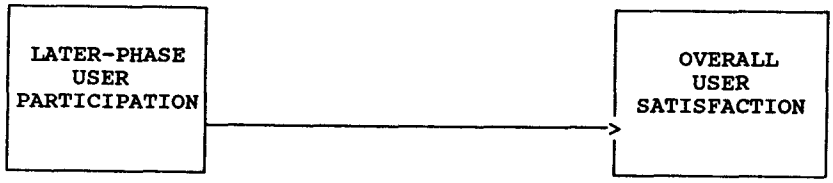

Figure 4b. Behavioral-Attitudinal Model (Fully Recursive)

Figure 4. Path Models for Primary Research Question

6.2 The Primary Research Question

In light of the preceding, a restatement of the primary research question is: Does user participation in information system installation activities induce a psychological state of user involvement in the information system, which intervenes in and thus influences, the relationship between user participation and a user's overall satisfaction with that information system? The presumption was made that by testing this more restricted hypothesis, light would also be shed on the more general research question concerning the relationship among the participation, the involvement, and the satisfaction of system users throughout the life cycle of an information system (Ginzberg 1981). Figure 3 is a graphical re-statement of Figure 2 incorporating these restrictions.

Testing the research hypothesis (H1) called for the comparison of two different models. The path analysis approach for testing this hypothesis required the specification of two path models; these are shown in Figures 4a and 4b. These two path models are based on the measurement restrictions depicted in Figure 3. Hypothesis H1 was then restated to reflect these restrictions. The just-identified path model in Figure 4a is the embodiment of the behavioral-attitudinal model depicted in Figure 3, with user involvement as an intervening variable.

Figure 4b is the behavioral model and this overidentified path model is simply a re-statement of Figure 1. Hypothesis H1 posits that Figure 4a would fit the data better than Figure 4b. The path analysis embodiment of hypothesis H1, and the hypothesis actually tested, is stated as hypothesis H1a. In order not to reject hypothesis H1, hypothesis H1a would have to be rejected. An equivalent, albeit more mathematical, way of stating hypothesis H1a is hypothesis H1b.

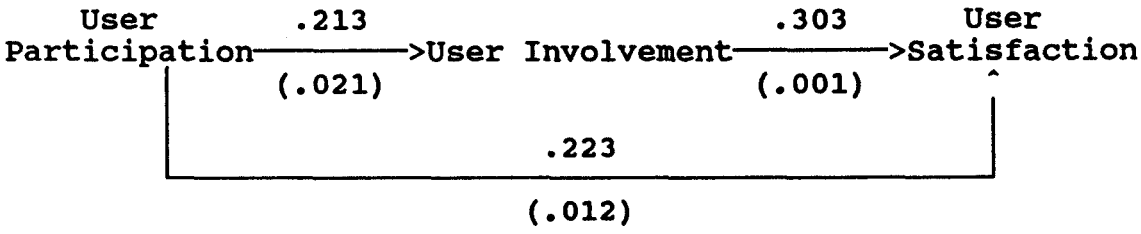

Figure 5a. Behavioral-Attitudinal Model (Just-Identified)

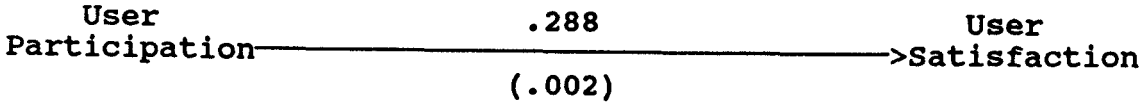

Figure 5b. Behavioral Model (Overidentified)

Path coefficients shown above path lines.
Number in parenthesis is p-value.
P-value is probability of larger path coefficient.
Sample size n = 117, down from 146 due to missing values.

Figure 5. Path Diagrams for Figures 4a and 4b

H1a: The behavioral model of information system success (Figure 4b) will fit the data.

H1b: Two of the path coefficients in Figure 4a, from user participation to user involvement and from user involvement to user satisfaction, are both zero.

6.3 Results

The two path diagrams shown in Figure 5 correspond to the two path models depicted in Figure 4. The path coefficients were calculated as beta-values (i.e., standardized regression coefficients) using SAS PROC REG with the STB option (SAS 1985). The significance of these coefficients was determined by means of t-tests and is stated as p-values. Figure 5a required two regression analyses and Figure 5b required only one.

The mathematical details of significance testing in path analysis can be found in Pedhauzer (1982). The essential detail for the purposes of this research is that the comparison of the models was based on the ability of the overidentified model to account for the variation in the data accounted for by the just-identified model. This power of the fully recursive model is calculated in terms of the "generalized squared multiple correlation" (p. 618) or R-square-m, which is a function of all of the R-squares of the just-identified model. R-square-m of the just-identified behavioral-attitudinal model (Figure 5a) was calculated to be .208. The analogous M-value of the overidentified behavioral model (Figure 5b) was calculated to be .083. Both R-square-m and M represent the generalized variance explained by their respective models. On this basis, the behavioral model accounted for less that 40% of the variance accounted for by the behavioral-attitudinal model. Path analysis addresses the significance of this model comparison calculation somewhat differently.

The goodness of fit measure of path analysis, the Q-value model-comparison statistic, was calculated to be .864 for the two models in Figure 5 that resulted in a W equal to 16.86. This was a significant value for a chi-square distributed statistic like W, since chi-square with two degrees of freedom at alpha .05 is equal to 5.99. Therefore, the rejection of hypothesis H1a, and thus H1b, was indicated. This implied the conclusion that the behavioral model does not fit the data in comparison to the behavioral-attitudinal model, i.e., that the two paths of hypothesis H1b are not zero. Consequently, the data failed to support the rejection of hypothesis H1 and an affirmative response to the primary research question was suggested. In other words, it appears that

(a) user participation does induce user involvement;

(b) this involvement does intervene in the participation-satisfaction relationship; although,

(c) user involvement may be more important than user participation in understanding user satisfaction; and,

(d) the behavioral-attitudinal theory of information system success is superior to the behavioral theory.

6.4 Discussion and Additional Evidence

The Question of Causation. The primary research question actually raises two distinct sub-questions. First it raises the issue of causation and asks: Does user participation induce user involvement? As Cook and Campbell (1979) state:

> It is traditionally assumed that there are three necessary conditions for assuming with any confidence that the relationship between two variables is causal and that [such is] the direction of causation (pp. 224-225).

First, that the variables of interest co-vary; that is, there is an association between them. Secondly, that there is temporal antecedence; i.e., the cause did precede the effect. And thirdly, that there are no other plausible alternative explanations.

The first condition of association has been empirically tested and the results are shown in the path diagrams in Figure 5. The path coefficients are an indication of association. The significant path coefficient for the participation-involvement path in Figure 5a suggests an association. Additional evidence of an association was provided by the significant Pearson correlation coefficient between the participation and involvement scales as reported in Table 1.

Tests for temporal antecedence, the second condition, are precluded by the absence of longitudinal data (Bateman and Strasser 1984). Such data are beyond the scope of this research project. However, it is true that these users did engage in participative behaviors, such as training and conversion, before system cutover. Moreover, since involvement is based on the perceived need-satisfying potentialities of an object, just knowing that a new information system was coming might be adequate for such inducement. On this basis, and from the evidence in the literature (Kanungo 1982; Zaichowsky 1986), the assumption was made that user participation does temporally precede user involvement. In any case, it apparently did so in this particular research situation where such participation was mandated and occurred before the new information system went operational. Future research is needed to determine if the causality may also flow in the opposite direction.

Table 1: Correlation and Beta Coefficients (n = 146)

	Installation Phase User Participation	User System Involvement	Overall User Satisfaction
Installation Phase User Participation	1.0	.208* (.019) 128	.238** (.005) 140
User System Involvement	.213* (.042)	1.0	.339** (.0001) 126
Overall User Satisfaction	.223* (.012)	.303* (.001)	1.0

Top-half are Pearson correlation coefficients.
Bottom-half are beta-coefficients from Figure 5a.
P-values are in parentheses
Sample size (n) is bottom number.
For all regression results, n = 117.
* : P-value < .05 ** : P-value < .01

Similarly, the third condition, that of alternative explanations, cannot be fully tested empirically. Moreover, the effects of un-included variables and/or common method bias, if any, are unaccounted for. The general lack of empirical evidence with regard to these latter two conditions for the assumption of causation is a limitation of this research.

The Question of Intervention. The second and more fundamental sub-question posed in the primary research question is: Does user involvement intervene in the user participation-information system success relationship? The path analysis just described (and pictured in Figure 5) also addressed this issue. Notice that, when user involvement was brought into the model, the path coefficient between user participation and user satisfaction changed from .287 (in Figure 5b) to .223 (in Figure 5a). This .223 can be interpreted as the direct effect of participation on satisfaction (Pedhauzer 1982).

The indirect effect of participation on satisfaction was calculated by multiplying the two path coefficients (in Figure 5a) from participation to involvement and from involvement to satisfaction, i.e., .213 times .303. This resulted in a value of .065 and is an indication of the indirect effect of participation on satisfaction as mediated by involvement. This suggests that nearly one-fourth of the effect of user participation on user satisfaction is mediated by user involvement.

Path analysis provided another approach to examining this issue of involvement intervening in the participation-success relationship. A different overidentified model was created

by deleting the participation-involvement path in Figure 5a. This model hypothesized participation and involvement as "independent causes" (Pedhauzer 1982, p. 588) of satisfaction. The path coefficients for the two paths in this independent- causes model are the same as those two paths in Figure 5a, the M-value was calculated to be .170, resulting in a Q-value of .955 and a W of 5.34. At one degree of freedom and alpha = .05, the chi-square equals 3.84, therefore rejecting the null hypothesis and concluding that this "independent-causes" model does not fit the data when compared to the mediated-cause model in Figure 5a.

The Role of User Involvement in Information System Success. The fact that all three of the paths in the Figure 5a path diagram are statistically significant suggests that none of these paths in the mediated-cause behavioral-attitudinal model could be assumed to be zero (Pedhauzer 1982). Such "theory trimming" (p. 616) resulted in no overidentified model that fit the data. This further substantiated the validity of the mediated-cause behavioral-attitudinal theory. Notice also, in Figure 5a, that the direct effect of user involvement on user satisfaction is more than one-third (35.9%) larger than the direct effect of user participation on user satisfaction.

Moreover, two separate simple regression analyses of overall satisfaction on each of these independent variables confirmed the finding of the multiple regression analysis. Both models were statistically significant, but the regression of satisfaction on involvement was more significant and accounted for nearly 50% more of the variance in overall user satisfaction than the regression of satisfaction on participation (R-square = .123 versus .083; beta = .351 versus .287; p-value < .0001 versus .0016; n = 117). Similarly, as shown in Table 1, the Pearson correlation coefficient of satisfaction and participation was .238 while that of satisfaction and involvement was .339.

7. RECAPITULATION AND CONCLUSIONS

7.1 The Respective Roles of User Participation and User Involvement

There is strong evidence in support of the need to recognize the user involvement construct as something distinct from, although associated with, user participation in order to understand better user satisfaction and, presumably, information system success. It appears that both user participation and user involvement are important in developing a complete understanding of information system success, particularly of information system user satisfaction. To ignore either the behavioral or the psychological side of user engagement invalidates the resultant model. Furthermore, the results suggest that this psychological dimension, i.e., user involvement, may be even more important in terms of the magnitude of its impact on user satisfaction.

At fairly robust levels of significance, an affirmative answer has been found to the primary research question. The empirical evidence suggests that user participation, at least the types of participation engaged in by the users examined in this study, has a positive and statistically significant association with user system involvement. The theory, implied by the primary research question, that such participation causes such involvement, has withstood the test and has not been disconfirmed, at least insofar as this study is concerned. Similarly, the empirical evidence supports the hypothesis of the mediating role played by user involvement in the participation-satisfaction relationship.

The results of the path-analytic model comparison confirms the superiority of the behavioral-attitudinal theory of information system success. The empirical evidence supports the importance of taking into consideration more than just the behavioral engagement of users (i.e., their participation) in the development of information systems. It appears that the satisfaction of users with an information system can be better understood when their psychological engagement (i.e., their involvement) in the information system (and presumably in its development as well) is also considered.

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APPENDIX
QUESTIONNAIRE ITEMS USED FOR THEORY TESTING

Installation Phase User Participation:

Regarding the NEW SYSTEM, I participated ...
- ... in planning the installation or conversion.
- ... in scheduling conversion or installation tasks.
- ... in the actual installation and/or conversion.
- ... in scheduling training sessions for others.
- ... in scheduling my own training sessions.
- ... in training sessions (as a trainee).
- ... in training or instructing others (as trainer).
- ... in designing or developing training programs.
- ... in installing, converting, or implementing it.
- ... in evaluating its performance.
- ... in writing user documentation and manuals.
- ... in evaluating how well it met its objectives.
- ... as the office "facilitator" or support person.

User System Involvement:

THE NEW COMPUTER SYSTEM is/was:

useful	useless*
beneficial	not beneficial
appealing	unappealing
vital	superfluous
interesting	boring*
wanted	unwanted
needed	not needed*
valuable	worthless
important	unimportant
relevant	irrelevant*
fundamental	trivial*
fascinating	mundane*
essential	nonessential
desirable	undesirable*

Items marked with * appeared in reverse order.

Overall User Satisfaction:

Overall, I am very satisfied with the new system.