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Participation, Satisfaction, and Productivity:  
A Meta-Analytic Review

CEO Publication  
T86-4 (82)

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March 1986

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PARTICIPATION, SATISFACTION, AND PRODUCTIVITY:  
A META-ANALYTIC REVIEW

Abstract

This paper reports the results of a meta-analytic review of research investigating the effects of participation in decision making on employee satisfaction and productivity. Cognitive, affective, and contingency models of participation are reviewed, and the predictions these models would make are considered. The method of literature search and effect size cumulation used in this study are then discussed, and the results of subgroup analysis are presented. Finally, the results are discussed in terms of the implications of the meta-analysis for cognitive, affective, and contingency models of participation. No support is found for contingency models. The results in field studies provide some support for a cognitive model of the effect of participation on productivity. In addition, there is strong evidence for an affective model linking "participative climate" with worker satisfaction. Methodological variation also played an important role in subgroup analysis, and the implications of this method variance are considered.

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I would not think of making a decision by going around the table and then deciding on the basis of how everyone felt. Of course, I like to hear everyone, but then I go off alone and decide. The decisions that are important must be made alone.

Richard M. Nixon, quoted by Schecter, 1972

Like Mr. Nixon, most people have strong feelings about the "best way" to make decisions. However, these opinions are often conflicting. Should subordinates be included in the decision making process, or should a manager "stand alone" in the decision-making role? This debate is far from limited to high national offices. Indeed, the debate over the efficacy of participation in decision making exists in government, business, and throughout many academic fields.

There are several reasons for the continuing disagreement on this topic. First, moral reasoning regarding participation is often confounded with practical reasoning. Locke and Schweiger (1979) provide several examples of managers and academicians advocating the use of participation on moral grounds, regardless of whether or not it "works." Second, there are many conflicting models of the mechanisms at work in the process of participation. These conflicting models lead to confusion over the interpretation of research findings. Finally, in spite of the plethora of empirical research investigating participation, reviewers of the literature, when concluding about the effectiveness of participation, invariably still come up with the answer: "it depends" (see, e.g., Locke & Schweiger, 1979; Lowin, 1968; and Singer, 1974). Unfortunately, the question of what "it depends" on has never been clearly answered.

This paper will present a meta-analytic review of research on the effect of participation in decision-making on satisfaction and productivity. First, the most recent comprehensive review of the effects of participation (Locke & Schweiger, 1979)

will be considered in terms of its conclusions, strengths, and weaknesses. Meta-analysis will be proposed as a method which can extend and refine the conclusions of Locke and Schweiger. The possible conceptual and methodological moderators of participation effects will then be considered, and the meta-analytic techniques used in this research will be discussed. Following this, results of the analyses will be presented, and their implications for models of participation will be considered.

### "ONE MORE LOOK" REVISITED

In recent years, there have been several wide-ranging reviews of thinking and research on participation in the workplace. For example, Strauss (1982) took an international perspective on worker participation, while Dachler and Wilpert (1978) looked at the dimensions and boundaries of the participation process. Perhaps the most comprehensive review of empirical research to date, however, has been Locke and Schweiger's (1979) "one more look" at participation in decision making, which considered moral and practical arguments advocating participation. Their review of research on participation included laboratory studies, correlational studies, multivariate field studies, and univariate field studies. The two criterion variables considered in their review were satisfaction and productivity. Locke and Schweiger concluded that little could be said about the effects of participation from the multivariate field studies, as too many other variables (e.g., differences in training, reward systems, education) could account for effects often attributed to participation. However, Locke and Schweiger did make generalizations based on correlational, laboratory, and univariate field studies.

Locke and Schweiger classified study conclusions as "participation superior," "participation inferior," or "No difference or contextual." Locke and Schweiger found that the results in laboratory, correlational and univariate field studies were

remarkably consistent, and their final conclusions regarding the effect of participation on satisfaction and productivity were:

- (1) With respect to the productivity criterion there is no trend in favor of participative leadership as compared to more directive styles; and
- (2) with respect to satisfaction, the results generally favor participative over directive methods, although nearly 40 percent of the studies did not find participation to be superior (Locke & Schweiger, 1979: 316).

Although Locke and Schweiger's review considered well over 50 empirical research reports on participation, their final conclusions seem somewhat anti-climatic. There are probably several reasons for this. First, Locke and Schweiger used a very gross classification system in considering research on participation. The categories of "superior," "inferior," and "contextual," though certainly useful, tell us nothing about the strength of effect of participation on satisfaction and productivity. Second, there was a high percentage of studies which fell into the "contextual" category (56% for the productivity criterion and 30% for the satisfaction criterion). Locke and Schweiger suggest a number of contextual factors to account for the effectiveness of participation, including the individual factors of knowledge and motivation, and organizational factors such as task attributes, group characteristics, and leader attributes. However, they did not go back to the studies included in the review to systematically sort out these contextual effects. Finally, no attempt was made to consider systematic patterns which differentiated the "participation superior" studies from the "participation inferior" research.

A method which could be usefully employed to refine and extend the findings of Locke and Schweiger is meta-analysis (Hunter, Schmidt, & Jackson, 1982). This method of cumulating results over studies provides an opportunity to numerically

summarize the effects of participation on satisfaction and productivity, taking into account artifactual and substantive sources of variance in the individual effect estimates. Meta-analysis provides an improvement over the review methods used by Locke and Schweiger on several counts. First, meta-analysis considers the strength of effect between two variables rather than simply counting significant results or probability levels. This provides a more accurate representation of the cumulated relationship between the variables and eliminates the problem of giving a study with a strong effect the same consideration as one with a barely significant effect. Second, meta-analysis provides methods for correcting for systematic artifactual sources of variance in the effect estimate such as measurement error and restriction in range. Third, meta-analysis allows for the consideration of moderator variables which could account for unexplained variance in effect estimates. These moderator variables could include both substantive variables and methodological variables.

In a recent review considering the effect of research setting on participation results, Schweiger and Leana (1985) rejected the use of meta-analysis because of lack of consistency in the reporting of means, standard deviations, and correlations among participation studies. This concern is an important one, especially if lack of reported statistics might lead to systematic biases in the review. However, the Hunter, et al., meta-analytic techniques used in this analysis only require estimates of effect size -- not means and standard deviations. The reporting of effect sizes (correlations, eta, t-values) has been much more frequent in the participation literature than reporting of means and standard deviations. Thus, it was decided that a meta-analysis of this literature would be a useful technique for resolving several of the problems that exist in earlier reviews. In the next section of this paper, the relationship between participation and satisfaction and productivity will be discussed through the presentation of cognitive, affective, and contingency models of participation. Meta-analysis will not allow for the direct test of these models. However, the models will

allow for the identification of substantive and methodological variables which could moderate the relationship between participation and satisfaction and productivity.

## PARTICIPATION, SATISFACTION, AND PRODUCTIVITY

A variety of models have been proposed to account for the influence of participation on satisfaction and productivity. These models consider the mechanisms through which participation should have an impact on satisfaction and productivity. Three types of models will be discussed below: cognitive, affective, and contingency models. These models should serve as generalizations about the alternative mechanisms theorists have proposed to explain the effects of participation. They are not mutually exclusive, as many theorists have proposed that cognitive, affective, and contingency variables all play an important role in the participation process. Each of the three models, however, emphasizes a different explanatory mechanism.

### Cognitive Models of Participative Effects

The cognitive model of participative effects suggests that participation in decision-making is a viable strategy because it enhances the flow and utilization of important information in an organization. Theorists supporting this model (e.g., Anthony, 1978; Frost, Wakely, & Ruh, 1974) propose that workers typically have more complete knowledge of their work than management; hence, if workers participate in decision making, decisions will be made with a better pool of information. This is the "upward" aspect of the cognitive model. In addition, the cognitive model suggests that if employees participate in decision-making, they will have better knowledge for implementing work procedures after the decisions have been made (Maier, 1963; Melcher, 1976). Ritchie and Miles (1970; Miles & Ritchie, 1971) have called the



cognitive model the "Human Resources" theory of participation. They note that this model is "primarily concerned with the meaningful utilization of subordinates' capabilities and views satisfaction as a by-product of their participation in important organizational decisions" (Ritchie & Miles, 1970: 348).

The cognitive model predicts a definite pattern of results in empirical research investigating participation, satisfaction and productivity. First, because this model considers information to be crucial, productivity increases are expected to be stronger in situations where the worker has "quality" information about the decision to be made. For instance, this model would predict a stronger effect for participation in job design than for participation regarding company-wide policy decisions or participation in an experimental discussion task. Second, this model does not predict immediate increases in satisfaction as a result of participation in decision making, as it is essentially a knowledge of results that is hypothesized to lead to eventual increases in satisfaction. Third, this model would not predict increases in worker productivity and satisfaction simply from working in a "participative work climate" or for a "nondirective" leader. Increases in productivity and satisfaction in this model are attributable to specific inputs from subordinates on issues in which they are interested and knowledgeable.

### Affective Models of Participative Effects

There are several models which link participation to productivity and satisfaction through affective mechanisms. These models are most adamantly espoused by followers of the "human relations" school of management (e.g., Blake & Mouton, 1964; Likert, 1967; McGregor, 1960). The most crucial link in these models is between participation and worker satisfaction. These theorists propose that participation will lead to greater attainment of higher order needs such as self-

expression, respect, independence, and equality. In turn, the attainment of these needs will lead to increased morale and satisfaction.

Ritchie and Miles (1970) have called this model the "Human Relations" approach to management. They state that "managers who hold the Human Relations theory of participation believe simply in involvement for the sake of involvement, arguing that as long as subordinates feel they are participating and are being consulted, their ego needs will be satisfied and they will be more cooperative" (Ritchie & Miles, 1970: 348).

The link between participation and productivity in affective models is less straightforward. Essentially, this school proposes that participation will lead to higher levels of productivity through intervening motivational processes. These theorists propose that participation fulfills needs, fulfilled needs lead to satisfaction, satisfaction strengthens motivation, and increased motivation improves worker productivity. According to French, Israel, and As (1960):

One effect of a high degree of participation by workers in decisions concerning their own work will be to strengthen their motivation to carry out these decisions. This is the major rationale for expecting a relation between participation and production. When management accords the workers participation in any important decision, it implies that workers are intelligent, competent, and valued partners. Thus, participation directly affects such aspects of worker-management relations as the perception of being valued, the perception of common goals, and cooperation. It satisfies such important social needs as the need for recognition and appreciation and the need for independence. These satisfactions and in addition the improvements in their jobs that are introduced through participation lead to higher job satisfaction (French, Israel, & As, 1960: 5).

Although several theorists (e.g., Locke & Schweiger, 1979; Ritchie & Miles, 1970) feel strongly that scholarly and practical emphasis should be placed on the cognitive effects of participation, researchers following from McGregor, Likert, and the classic work of Coch and French (1948) still hold strongly to the importance of participation in providing affective changes in workers. Thus, it is important to consider the predictions of this model for the effects of participation on satisfaction and productivity. First, this model predicts that participation will affect satisfaction in a wide variety of situations. Participation need not be centered on issues of which employees are particularly knowledgeable, for it is the act of participation, not the informational content of participation, which is the crucial mechanism. Second, this model does not predict increases in productivity without initial increases in worker satisfaction. Finally, the affective model might suggest that lower-level employees would be more strongly influenced by participation than managers, as managers may well have higher-order ego needs fulfilled by other aspects of their work.

### Contingency Models of Participative Effects

Several theorists suggest that it is not possible to develop models of participative effects which will hold across a wide variety of individuals and situations. Rather, they suggest that participation will impact satisfaction and productivity differently for different people and situations. Scholars have offered a variety of contingency theories which center on personality, the decision situation, superior/subordinate relationships, job level, and values.

Vroom (1960) was the first to propose that personality might mediate the effects of participation on satisfaction and productivity. Specifically, he suggested that only employees who had a low authoritarian personality and a high need for independence would be positively influenced by participation, i.e., participation would have a

positive impact on satisfaction and productivity. Vroom found some support for his hypotheses and his work has stimulated other research. However, further studies have provided mixed support for his hypotheses (Abdel-Halim, 1983; Tosi, 1970; Vroom & Mann, 1960).

Vroom was also involved in the major theoretical statement of situational influences on the participation process. Vroom and Yetton (1973) building on the work of Tannenbaum and Schmidt (1958), consider different decision situations and provide rules for deciding the optimal level of participation in the decision making process. They propose both rules to protect the quality of the decision and rules to protect the acceptance of the decision. Most of the research on this model has been descriptive in nature -- i.e., self-reports about how managers behave in different decision situations. Several normative tests (e.g., Vroom & Jago, 1978), though, have also indicated that decisions made within participative modes specified by the "rules" were more effective. It should be noted that Vroom and Yetton's work moves toward an integration of cognitive and affective models of participation. Their contingency rules for protecting the quality of decisions deal with the cognitive portion of the participation process, while their rules for protecting the acceptance of decisions address the affective components of participation.

Several other theorists have proposed additional intervening variables in the participation process. For example, some theorists suggest that the type of problems dealt with at various levels of an organization makes participation appropriate or inappropriate (Vroom & Deci, 1960). These investigators suggest that participation may be less applicable at lower levels of the organization where jobs are routine. The complex problems dealt with at higher levels of the organizations are thought to be more appropriate for participation. Second, several scholars (e.g., Hulin, 1971; Singer, 1974) have suggested that it is values which mediate the participation-outcome relationship. Specifically, they suggest that many workers do not value participation

to the extent that academicians do. Singer (1974: 359) further criticizes, "While the necessity for determining a 'one best' leadership style for the 'composite worker' is understandable from a financial and expediency standpoint, to assume that all workers desire participation opportunities is to lack sensitivity to individual needs -- the antithesis of the humanization that ardent proponents of participation advocate." Thus, these scholars predict that participation may only be effective for employees in certain types of organizations (for example, research or service organizations rather than manufacturing organizations), or only for middle or upper level employees.

In sum, scholars have posited several models to account for the effects of participation on satisfaction and productivity. These models can be divided into cognitive, affective, and contingency models:

Cognitive models of participation propose that participation leads to increases in productivity through higher quality information being inputted to the decision and through greater knowledge at the time of implementation. This model predicts that:

The impact of participation on productivity will be the strongest for decisions which draw upon the individual's expertise.

There will not be a direct influence of participation on job satisfaction. Rather, this effect will be mediated by the effect of participation on productivity.

Participation in specific decisions is necessary for an increase in productivity and satisfaction. Working in a "participative climate" is not adequate for increases in worker satisfaction and productivity.

The affective model suggests that participation will satisfy higher order needs of workers. As these needs are satisfied, workers will be more satisfied with their job.

This model predicts that:

Working in a participative climate is adequate for increasing worker productivity. It is not necessary that workers participate in decisions on which they have special knowledge.

There is not a direct link between participation and productivity. Rather, improved attitudes are hypothesized to reduce resistance to change and increase motivation through the satisfaction of needs.

Participation may provide more noticeable increases in satisfaction for employees who are not having higher order needs fulfilled from other aspects of their jobs.

Contingency models of participation suggest that no single model of participation is appropriate for all employees in the organization. Instead, various contingency models predict that:

Employees with high needs for independence and low authoritarian personalities will be the most positively influenced by participation.

Some decisions are more appropriate for participation than others. The appropriateness of participation depends on required decision quality or decision acceptance (Vroom and Yetton, 1973), or the complexity of the decision.

Employees who hold a value for participation will be the most positively influenced by participation. It is suggested that these employees are higher level employees, or individuals working in research or service industries.

### Methodological Moderators

In addition to the substantive moderators suggested by the cognitive, affective, and contingency models, there are several methodological moderators which might explain variance in findings about the relationship between participation and satisfaction and productivity. According to Schweiger and Leana:

One potential contextual factor that has not been adequately addressed in previous reviews of the PDM [participation in decision making] literature concerns the research environment in which participation has been examined. Just as PDM may be effective for some subordinates and not for others, consistent findings concerning the effects of PDM may depend, at least in part, on the research setting in which PDM is being investigated (Schweiger & Leana, 1985: 148).

Schweiger and Leana (1985) compared studies conducted in laboratory settings with those conducted in field settings. Locke and Schweiger (1979) considered laboratory, correlational, multivariate, and univariate field studies. Neither of these reviews found that research setting moderated the effect of participation on satisfaction and productivity. Schweiger and Leana conclude that "the laboratory is capable of producing findings that are generalizable to the field" (p. 18). However, it should be noted that both of these reviews used counting or narrative techniques in

considering the differences among research reports. It is quite possible that the more stringent requirements of meta-analysis could reveal effects for research setting that were not apparent in these reviews.

A second methodological variable which might moderate participative effects found in research is measurement. There are many conceptual definitions of participation, ranging from delegation to representative participation systems to joint superior-subordinate decision making. Following Locke and Schweiger (1979), we will define participation as "joint decision-making." This definition does not specify the precise form or content of the participative process, but does exclude delegation as participation. Within this conceptual definition, however, there has been a wide range of operationalizations of participation. Similarly, the concepts of satisfaction and productivity take on many meanings in different research efforts. It is quite possible that this wide range of conceptual and operational definitions has resulted in varying strengths of relationships between participation and satisfaction and productivity.

## METHODS

A literature search was conducted for relevant research on the effects of participation on satisfaction and productivity. This search included journals in the areas of social psychology, management, organizational behavior, communication, and several relevant social citation indices. The search was restricted to the published literature and to English language journals and books. Dissertations and other unpublished research were not included in the literature search. It is possible that this lead us to include more studies with significant results and fewer with nonsignificant results. However, Hunter, Schmidt, and Jackson (1982) do not see this as a serious problem, noting that it is likely that nonsignificant dissertation results may well be attenuated due to methodological problems. They further state that a very large



number of "lost" studies are typically needed to make a substantive difference in a meta-analysis.

This literature search resulted in 106 articles and book chapters on the subject of participation. However, many of these were not appropriate for meta-analysis. First, literature reviews and non-data based essays (12 articles) were eliminated. Second, data based articles without quantifiable effect sizes (13 articles) were eliminated. Third, studies in which participation was the dependent variable (5 studies) were eliminated. Fourth, several studies were eliminated because the dependent variables were not appropriate for this meta-analysis (6 studies). Fifth, studies were eliminated if there was not a clear measure of participation (15 studies). Finally, studies were eliminated if methodological anomalies posed serious questions about an effect estimation (7 studies)<sup>1</sup>, or if the data were included in another study in the meta-analysis. The studies excluded from the meta-analysis, publication year, sources, and reason for exclusion are included in Table 1.

It should be noted that several "classic" organizational studies were eliminated because of compounding variables or methodological anomalies. For example, results of the Hawthorne Studies (Roethlisberger & Dickson, 1939) have often been attributed to increased participation and interaction. However, several commentaries (Carey, 1967; Lawler, 1975) have provided strong evidence that those reported effects can be more reasonably attributed to rest pauses, reduced work hours, and personnel replacements. The Coch and French study (1948), the classic study which stimulated interest and research in participation, is also plagued by methodological anomalies. Bartlem & Locke (1981) point out that the productivity and morale increases in the Coch & French study should probably be attributed to improved training techniques rather than participation. Also, the extraordinarily small within group variance in this study (possibly the result of group conformity) made the computation of an effect size from this study misleading. Finally, the productivity estimate in the the often-cited

Morse and Reimer (1956) field study was not used because the only way productivity could be increased was through the elimination of employees. Not surprisingly, the participative group was unwilling to do this, and productivity increases were much higher in the hierarchical division of the company.

From this process of literature search and elimination, 47 studies were found which contained quantifiable estimates of the relationship between participation in decision making and satisfaction or productivity. Of these, nine studies were experimental or quasi-experimental studies with subjects who were not organizational members, 13 studies were field experiments where participation was manipulated in an organization, and the remaining studies were correlational. Many studies contained estimates of the effect of participation on both satisfaction and productivity, and several studies included more than one estimate from multiple samples. In total, 41 estimates of the effect of participation on satisfaction were available, and 26 estimates of the effect of participation on productivity were available. The studies included in the analysis, the year of publication, sample sizes, and effect size estimates are included in Tables 2 and 3.

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Tables 2 and 3 about here

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A meta-analysis (Hunter, Schmidt, & Jackson, 1982) was performed on these studies. Meta-analysis involves the computation of an effect size between the variables of interest for each study. After individual effect sizes are computed, they are cumulated for an estimate of the effect over a large number of studies. This estimate can be corrected for statistical sources of variance, and the variance due to hypothesized moderating variables can be estimated.

The first step in this analysis was the computation of an effect size for each study. Two estimates were available,  $d$ , recommended by Glass, McGaw, and Smith (1981), and  $r$ , recommended by Hunter, et al. (1982). These estimates are direct transformations of each other, but  $r$  was chosen because it provides several advantages. First, the correlation coefficient has a well-known finite metric which ranges from -1.00 to +1.00. Second,  $r$  is applicable in related analyses such as path analysis and multiple regression. Third, the correlation coefficient permits the identification of variance due to statistical artifacts such as sampling error, measurement error, and restriction in range.

After  $r$  was computed for each study, the coefficient was corrected for measurement error if reliability estimates were available. Unfortunately, reliability estimates were included in less than half the studies under consideration. Further, no studies included information which would allow for correction for restriction in range. Thus, the correlation coefficients were cumulated after correcting for attenuation due to measurement error.

Separate analyses were performed for each dependent variable. The effect sizes were cumulated and a weighted average effect size was computed. The variance in that cumulated effect size estimate was computed, and variance expected from sampling error was subtracted from the actual variance. This resulted in an estimate of true variance in the correlation coefficient. If the true variance estimate was larger than zero (statistically testable through chi square), moderating variables were considered. The procedure above was repeated until it became clear that all possible variance had been accounted for.

Based on the discussion of substantive and methodological moderators above, a variety of moderating variables as considered for subgroup analysis. These were:

The type of job held by study participants, i.e., managers, production workers, professionals, clerical/technical workers, or mixed groups.

The type of organization in the study, i.e., manufacturing, service, utility, drug, engineering, research, or military.

The object of participation, i.e., general participation, appraisal interviews, job redesign, goals, training tasks, financial decisions or experimental tasks.

The study design involved, i.e., laboratory experiment, field experiment, or correlational study.

The manipulation or measurement of participation, i.e., leadership style, type of group tasks, leadership behavior, general participation, decisional deprivation, actual participation, representative participation, or observational coding.

The measurement of satisfaction, i.e., overall satisfaction, work satisfaction, attitude toward job, satisfaction with supervision, intrinsic satisfaction, attitude toward experimental task. Consideration was also given to whether measurement of satisfaction was through a well-known scale such as the JDI (Smith, Kendall, & Hulin, 1969) or through an instrument designed specifically for an individual study.

The measurement of productivity, i.e., time scores, error scores, costs,

sales, manager performance ratings, unit production per time, or perceived productivity.

## RESULTS

The results of the meta-analyses with satisfaction and productivity as dependent variables will be discussed separately in this section. The combined implications of these results will be considered in the discussion section.

### Dependent Variable: Satisfaction

Forty-one estimates of the relationship between participation and satisfaction were considered. After cumulating effect estimates, the weighted mean correlation was .34, and the true variance was .0299. A chi-square test showed this variance to be statistically different from zero (chi-square = 245.14,  $df = 40$ ,  $p < .01$ ), so moderator variables were considered to reduce the variance in estimates.

An attempt was first made to consider substantive moderators such as organizational type, job level, and decision type. None of these subgroupings proved useful in reducing variance or in differentiating among effect sizes. Hence, methodological moderators were considered.

The first moderator variable which was effective in reducing subgroup variance was type of respondent. The studies were divided into those conducted with non-organizational subjects (i.e., students) and those conducted with organizational respondents. The mean weighted correlation for the non-organizational studies was .38; the true variance among these estimates was negative (hence considered to be zero). The variance in the organizational studies was still significant, so additional moderators were considered.

The organizational studies were then divided into those which considered actual participation and those which considered perceived participation. The mean weighted correlation for studies considering actual participation was .16. The variance among these estimates was .0035. This variance is not significantly different from zero (chi-square = 8.19,  $df = 10$ ,  $p > .05$ ). However, the variance in studies considering perceived participation was still significant.

One additional moderator was considered to eliminate the remaining variance among effect size estimates. This was whether perceived participation was in reference to specific issues (e.g., goals, pay plans, job redesign), or in reference to multiple issues or a general participative "climate" (e.g., "In general, how much do you participate in decision-making on your job?"). The mean weighted correlation for specific issue studies was .21; the variance among these estimates was .0009. This variance was not significant (chi-square = .78,  $df = 4$ ,  $p > .05$ ).

The mean weighted correlation for the multiple issue studies was .46. The variance among these effect size estimates was .1064. This variance is still significant (chi-square = 93.5,  $df = 19$ ,  $p < .01$ ). Several other variables (i.e., measurement, job level, and organizational type) were considered for further reducing the variance among effect sizes. However, no other moderator variables reduced the variance within subgroups, so the analysis of satisfaction studies ended at this point.

Table 2 presents information regarding the satisfaction subgroups in which variance was reduced to the greatest extent possible. These groups include (1) nonorganizational studies, (2) actual participation studies, (3) specific issue perceived participation studies, and (4) multiple issue perceived participation studies. The table provides the studies included in each subgroup, the mean weighted correlation, the observed variance among effect size estimates, the variance among estimates expected from sampling error, the true variance among estimates, and the chi-square value testing whether the variance is statistically different from zero. A tree diagram

of analyses performed with satisfaction as the dependent variable is presented in Figure 1.

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Figure 1 about here  
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All of the subgroup estimates for the satisfaction variable are significantly different from zero but there is substantial variation in the magnitude of effect. The strongest effects of participation on satisfaction is for multiple issue perceived participation studies and the nonorganizational studies. Much smaller effects are found in the single issue perceived participation and the actual participation studies. In three out of four subgroups, the variance has been reduced to that which would be expected from sampling error. Because of the reduction in variance and the sharp differences in subgroup effect sizes, it appears that the analyses were successful in partitioning the studies into appropriate subgroups.

#### Dependent Variable: Productivity

25 studies were considered which contained an estimate of the relationship between participation and productivity. After cumulating effect estimates, the weighted mean correlation was .15, and the true variance was .0322. A chi-square test showed this variance to be statistically different from zero (chi-square = 68.51,  $df = 25$ ,  $p < .01$ ), so moderator variables were considered.

Again, substantive moderator variables were considered first. Of these variables, the object of participation under consideration proved to be useful for subgroup analysis. Eight studies investigated the effects of participation in goal-

setting on productivity. The mean weighted correlation for goal-setting studies was .11. The variance among these estimates was zero. However, the variance among non-goal-setting studies was still significant, so additional moderators were sought. The other substantive moderators did not prove useful, so methodological moderators were considered.

The first methodological moderator used was research setting. The mean weighted correlation for the nine field studies was .27. The variance among these estimates was zero. Hence, no further analyses were necessary on this subgroup. However, the variance among estimates for the laboratory studies was significant, so further subgroup analysis was considered.

The final moderator considered for productivity studies was the manipulation used in the laboratory studies. Four of the studies manipulated leadership style (i.e., a research assistant or member of the experimental group was instructed to be leader and to behave in an authoritarian or democratic style). The correlation between participation and productivity in the leadership style studies was  $-.33$ ; the variance among these estimates was  $.014$ . This variance was not significant (chi-square =  $3.73$ ,  $df = 3$ ,  $p > .05$ ). The other four studies manipulated the nature of the task the group performed (e.g., subjects were placed in assigned or participative task groups). The correlation between participation and productivity in these studies was  $-.01$ ; the variance among the estimates was zero.

Table 3 presents information regarding the productivity subgroups in which variance was reduced to the greatest extent possible. These groups are (1) goal-setting studies, (2) field studies, (3) laboratory-manipulated leadership style studies, and (4) laboratory-manipulated nature of the task studies. The table provides the studies in each subgroup, the mean weighted correlation, the observed variance among effect size estimates, the variance among estimates expected from sampling error, the true variance among estimates, and the chi-square value testing whether the



variance is statistically different from zero. A tree diagram of subgroup analyses performed with productivity as the dependent variable is presented in Figure 2.

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Figure 2 about here

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As with the satisfaction studies, the mean weighted correlations of the different subgroups are substantially different. The laboratory studies that manipulated the nature of the task show essentially no correlation, and the goal setting studies exhibit a significant, but small, positive correlation. The field studies show a relatively strong positive correlation, and the leadership style studies exhibit a relatively strong negative correlation. The variance among estimates in these subgroups has been reduced to that which can be attributed to sampling error. Because of the substantially different effect sizes and the reduction in subgroup variance, it appears that the partitioning efforts were appropriate and successful.

## DISCUSSION

The results of the meta-analyses of participation with satisfaction and productivity as dependent variables will be discussed in this section. First, the results will be discussed in terms of implications for contingency models of participation. Second, the results will be evaluated in terms of evidence for the cognitive and affective models of participation, and the implications of a climate conceptualization of participation will be discussed. Finally, the important role of research setting as a moderator variable in this analysis will be considered.

## Contingency Models of Participation

This meta-analysis provided no support for any of the contingency predictions discussed above. Both job type and organizational type were considered as possible moderator variables at all stages of analysis, but there was no reduction of variance in effect sizes through subgrouping with these variables. Thus, it does not appear that participation is more effective for managers than for lower-level employees or vice versa. There is also no evidence that research, service, and manufacturing organizations differ in terms of the effectiveness of participation. It was not possible to provide a test of personality contingency predictions. Very few studies provided subgroup analyses considering individuals with different personality types. As mentioned earlier, studies which have considered authoritarianism and need for independence have provided conflicting conclusions.

Finally, it should be noted that the variance in goal-setting studies was reduced to that accountable to sampling error. The correlation between participation in goal-setting and productivity was significant, but small ( $r = .11$ ). This result should come as little surprise to goal-setting researchers, as most have now concluded (e.g., Latham, & Marshall, 1982; Latham & Steele, 1983) that participation may have an effect on the level of goal set, but if the level of the goal is kept constant, participation will not have an effect on productivity. Cumulating these results over a variety of research settings adds credence to the generalizability of this conclusion, however.

## Cognitive versus Affective Models of Participation

This meta-analysis provided several tests to consider the efficacy of the cognitive and affective models of participation. First, the findings can be considered in terms of contrasting the effects of participation on satisfaction with the effects of

participation on productivity. Affective models predict a stronger effect of participation on satisfaction, while cognitive models predict a stronger effect of participation on productivity. Second, the cognitive model predicts a stronger influence of participation on productivity and satisfaction for decisions about which employees have specific knowledge. In contrast, affective models predict that working in a participative climate will have the most beneficial effects on worker attitudes and productivity. These comparisons will be considered in this section.

First, it should be noted that the non-goal-setting studies investigating productivity exhibited a stronger influence of participation ( $r = .27$ ) than the satisfaction studies investigating actual participation ( $r = .16$ ) or single variable perceived participation ( $r = .21$ ). Of course, comparisons of these effects considering different dependent variables should be made with caution, and the differences here are not substantial. However, even the fact that there is a moderately strong effect size for field studies investigating the influence of participation on productivity indicates that the cognitive model has some efficacy. Further, the relatively low (but significant) correlations between actual participation and satisfaction and between single issue participation and satisfaction might lessen one's confidence in an affective model of participation.

However, the data seem more consistent with an affective explanation when considering the multiple variable studies of participation. These studies investigated perceived participation and typically used questionnaires with such items as "In general, how participative is your workplace?", or, "How much do you generally share in decision-making with your supervisor?" After subgroup analysis, there was still some variance unaccounted for in this subgroup, but the mean weighted effect size was .46, much larger than the average correlations in other subgroups of field studies. It appears that working in a "participative climate" is strongly related to satisfaction at work. This result is in keeping with the human relations school of organizational

behavior and with current interest in work climates. In particular, this finding supports the idea of micro-climates (see Schneider, 1981) such as a "climate for variety," a "climate for innovation," or, in this case, a "climate for participation," which are related to individual attitudes. However, it is important to consider the structure of this relationship. Does a participative climate cause worker satisfaction? Does worker satisfaction help develop a participative climate? Or, are these two variables redundant indicators of the same concept?

LaFollette and Sims (1975), discussing Johannesson (1973), have summarized this dilemma well:

If it appears as if perceptual climate research is converging upon any domain, job satisfaction seems the likely candidate. Indeed it is hard to imagine how this possibly could have been avoided. Even if researchers had taken the pains to create new items and had adopted different item formats (which they have not) there remains the psychological problem of divorcing description from feelings. Since descriptions of work situations have been operationally defined as indices of job satisfaction it seems redundant at best to also term such descriptions organizational climate.

Climate has traditionally been defined as a descriptive construct and satisfaction as an affective construct. However, these definitions get muddled operationally if satisfaction is measured through descriptors (as in the Job Descriptive Index; Smith, Kendall, & Hulin, 1969), or if attitude items are included in climate scales. This problem probably is not crucial for the studies in this meta-analysis. First, participation involves a specific micro-climate, rather than omnibus organizational climate. Thus, it is not likely that participative climate and overall work satisfaction measures are redundant. Second, all of these studies considered descriptions of

participation rather than attitudes toward participation as the independent variable. Third, with the exception of studies using the JDI, satisfaction was measured with purely affective operationalizations. Moreover, results in studies using the JDI were not systematically different from those using other measures of satisfaction.

Finally, then, the question of causality remains. Does participation cause satisfaction or does satisfaction cause participation? All of the studies in the multiple issue subgrouping were correlational in nature, so this question cannot be answered with full confidence. However, evidence from the climate literature can be brought to bear on this issue. First, laboratory research investigating experimentally created social climates (Litwin & Stringer, 1968) found that manipulated climate had an effect on satisfaction. Second, Hand, Richards, and Slocum (1973) found a positive relationship between perceptions of climate at time one and acceptance of self and others at time two. Third, a cross lagged panel study in over 284 work groups in 15 different organizations by Taylor and Bowers (cited by LaFollette & Sims, 1975) found that "...organization climate shows evidence of being more the cause of, than caused by, satisfaction."

Several concluding comments about the comparison between cognitive, affective, and contingency models of participation are in order. First, there was little support for contingency models of participation, though the lack of measures for several contingency variables could have affected this finding. Second, it should again be emphasized that this meta-analysis did not allow for a complete test of the models presented, as several intervening variables in these models (e.g., upward and downward sharing of information, satisfaction of higher order ego needs) were not measured. We would encourage researchers to explicitly measure these variables in future investigations of participation. Given this limitation, however, there is some evidence to support both the cognitive and affective models of participation. The relatively large correlation between participation and productivity in field studies provides some

support for a cognitive model. However, the largest subgroup correlation, between perceived participation and satisfaction, provides greater support for an affective model of participation.

Thirteen studies considered in this analysis contained estimates of the effect of participation on both satisfaction and productivity. An examination of these studies sheds some light on the relative efficacy of the cognitive and affective models. Of these thirteen studies, (1) the relationship between participation and satisfaction was stronger than the relationship between participation and productivity in four studies (Katzell, et al., 1970; Schuler & Kim, 1978; Shaw, 1955; Vroom, 1960), (2) the relationship between participation and productivity was stronger in one study (Ivancevich, 1977), and (3) there was no significant difference in the other eight studies. These studies provide somewhat stronger evidence for the relationship between participation and satisfaction than between participation and productivity. However, the large number of insignificant differences in this subset of studies precludes us from suggesting that this comparison provides strong evidence for either the cognitive or affective model.

Several of the strongest moderating variables in this study were not the substantive variables, but methodological variables such as research setting, type of subject, and experimental manipulations. The final section of this paper will consider explanations for these variables as moderators in this meta-analysis.

#### Research Setting as a Moderator

The research setting and type of subject considered played important roles in this analysis. For the satisfaction studies, the variance among investigations involving nonorganizational subjects (all but one, Veen, 1972, in a laboratory setting) was zero. The weighted correlation for these studies was relatively high ( $r = .38$ ). This effect

size was considerably higher than studies involving actual participation in organizations ( $\underline{r} = .16$ ) or specific issue perceived participation ( $\underline{r} = .21$ ).

There are two clear explanations for these results. First, an internal validity explanation would suggest that because there is increased control in the laboratory over extraneous variables, the higher correlation is a better indicator of the "true" relationship between participation and satisfaction. However, an external validity explanation would suggest that college students and laboratory tasks have little in common with "real" organizational life; hence, an estimate of the effect between participation and satisfaction in the field is more meaningful. Both arguments undoubtedly have merit. This meta-analysis seems to indicate that there is a relatively high "pure" effect of participation on satisfaction, but that in field studies investigating actual participation (and specific issue perceived participation), the effect is diluted by a host of other organizational influences.

The effect of research setting in the productivity studies is also striking. For non-goal-setting studies, field studies showed a moderately high positive correlation ( $\underline{r} = .27$ ), while laboratory studies yielded no correlation (assigned versus participative task manipulation,  $\underline{r} = -.01$ ) and negative correlations (authoritarian versus participative leadership manipulation,  $\underline{r} = -.33$ ). The points of interest here are the sharp differences between laboratory and field studies and the difference in effect sizes for different manipulations.

The substantial difference between field and laboratory studies can probably be attributed to the tasks typically performed in these settings. The laboratory studies typically involved a simple and well-defined manipulated task (e.g., turning switches on a control panel, the "twenty questions" game), while the field studies typically involved participation in naturally occurring, more complex issues such as pay incentive plans or job design, or participation over a wide gamut of organizational issues. In the laboratory, there usually was a "correct answer"; there are rarely such

guarantees in organizations. Finally, organizational members in field studies had more at stake in the decisions that were made than students in a laboratory.

All of these factors contributed to a higher level of complexity for the organizational participative tasks than for the laboratory participative tasks. Research on small group behavior (see, for example, Cartwright & Zander, 1960) has suggested that different types of leadership and structure are appropriate for different types of task; specifically, that authoritarian leadership and centralized group structure are most appropriate for simple tasks. The studies in this meta-analysis investigating leadership behavior (authoritarian or democratic) bear this out. Most of the tasks were simple, and hence, authoritarian leadership was more effective in eliciting high levels of productivity. In contrast, the field studies involving more complex problems benefited more from participative processes. The lack of effect in the laboratory studies that manipulated the nature of the task is more difficult to interpret. It could be that in laboratory groups without a defined leader, manipulating groups to be "assigned" or "participative" (a typical manipulation) is not strong enough to elicit effects on productivity.

### Limitations

Though the results of this meta-analysis are relatively clear, there are a number of limitations of the meta-analysis procedure which must be considered. First, this analysis dealt entirely with published research. It has long been argued that published studies have larger effect sizes than unpublished studies, and there is some evidence for this claim (Smith and Glass, 1977). However, as Hunter, Schmidt, and Jackson (1982) point out, unpublished effect sizes may be smaller because of methodological quality, and "if attenuation effects were properly corrected for, differences might disappear" (Hunter, Schmidt, & Jackson, 1982: 30). Second, it has been argued that



meta-analysis gives the same weight to "good" studies as to "bad" studies. The current research has dealt with this problem in two ways. First, studies with severe methodological anomalies or interpretation difficulties were eliminated from the meta-analysis. Second, efforts were made throughout the analysis to account for variance in the studies through the use of methodological moderators. If the quality of study design or measurement accounted for differences in effect size, the meta-analytic techniques employed should have accounted for the differences.

Finally, it should be noted that the meta-analytic technique employed allows for the assessment of bivariate relationships. In this case, the relationships investigated were (1) participation and satisfaction and (2) participation and productivity. However, the affective, cognitive, and contingency models under examination were much more complex than the simple bivariate relationships examined in the meta-analysis. Thus, although the meta-analysis produced important information which provided varying levels of support for the models (e.g., the strong effect of participative climate on satisfaction provides support for the affective model), this analysis does not provide the information necessary to completely advocate one model or another.

## CONCLUSIONS AND FUTURE DIRECTIONS

In spite of the limitations above, the research reported here has supported some current wisdom about the effects of participation. It has also extended our knowledge of the participative process in organizations in some important ways. First, the meta-analysis provides some support to the conclusions reached by Locke and Schweiger (1979). Participation has an effect on both satisfaction and productivity, and the effect on satisfaction is somewhat stronger than the effect on productivity. However, this meta-analysis allows us to be more explicit about these effects. First, as

demonstrated in Figures 1 and 2, we can now make quite precise statements about the magnitude of the effect of participation on satisfaction and productivity. Second, there is strong evidence for a consistent and substantial effect of research setting in these studies. Consideration of this methodological variable considerably reduces the variance among studies. Third, this meta-analysis provides us with knowledge of specific organizational factors which may enhance or constrain the effect of participation. For example, there is evidence that "participative climate" has a more substantial impact on worker satisfaction than participation in specific decisions. Further, it appears that participation in goal setting does not have a strong impact on productivity.

These conclusions, with the limitations discussed above, provide some clear avenues for future research. First, it is important for organizational scholars to conduct research which can specifically test the relationships in the cognitive and affective models. For instance, research contrasting the effects of both participative climate and specific-issue participation on both satisfaction and productivity could lead to an important clarification of the cognitive and the affective processes at work in participative situations. Second, we should extend our consideration of contingency variables to areas pointed to by this meta-analysis. For example, the contrast between participative climate studies and specific-issue participation studies suggests that an organization with a formal system of participation may differ greatly from an organization in which participativeness is an informal managerial norm. Miller and Monge's (1986) investigation of the Scanlon plan of participative management suggests that this might be the case. Third, future research could usefully consider the overtime development of participative systems and norms in organizations. Longitudinal research of this nature could also help clarify the causal structure of the relationship among participation, satisfaction, and productivity. Finally, the meta-analytic procedure itself could be usefully extended to allow for the testing of relationships which go beyond the simple bivariate level.

## FOOTNOTES

1. The category of methodological anomalies included a number of studies in which confounding variables or unusual methods made accurate effect estimation impossible. For instance, the overtime study of Lawler and Hackman (1969) included an outlying data point which made interpretation difficult. In addition, the nonparticipative group in this study had much lower attendance than the participative group to begin with, limiting our confidence in the results. A second example of a methodological anomaly is Ivancevich's (1976) goal-setting investigation in which both participative and assigned groups went through extensive and active training sessions. In all ways except the actual goal-setting, both groups had high levels of participation.

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TABLE I

Studies Excluded from the Meta-analysis Organized by the  
Seven Reasons for Exclusion

Article	Journal
<b>Reviews and Essays Excluded</b>	
1. Dachler & Wilpert (1978)	Admin. Science Quarterly
2. Derber (1963)	Industrial Relations
3. Keeley (1984)	Admin. Science Quarterly
4. Lammers (1967)	Am. Sociological Review
5. Locke & Schweiger (1979)	Research in Org. Behavior
6. Lowin (1968)	Org. Beh. & Human Performance
7. Melcher (1976)	Human Resource Mgmt.
8. Mulder (1971)	Admin. Science Quarterly
9. Rosenfeld & Smith (1967)	Personnel Journal
10. Singer (1974)	Sociology of Work & Occupations
11. Strauss (1982)	Research in Org. Behavior
12. Wood (1973)	Psychological Bulletin
<b>No Quantifiable Effect Size Available</b>	
1. Carroll & Tosi (1970)	Admin. Science Quarterly
2. Chaney & Teel (1972)	Personnel
3. Dill, Hoffman, Leavitt, & O'Mara (1961)	California Mgmt. Review
4. Fleishman (1965)	Personnel Psychology
5. Ivancevich (1979)	Academy of Mgmt. Journal
6. Latham & Yukl (1975)	Journal of Applied Psychology
7. McCurdy & Eber (1953)	Journal of Personality
8. Miles & Ritchie (1971)	California Mgmt. Review
9. Powell & Schlacter (1971)	Academy of Mgt. Journal
10. Schuler (1977)	Academy of Mgmt. Journal
11. Stagner (1969)	Journal of Applied Psychology
12. Vroom & Jago (1978)	Journal of Applied Psychology
13. Vroom & Yetton (1973)	Leadership & Decision Making
<b>Participation as Dependent Variable</b>	
1. Alutto & Belasco (1972)	Admin. Science Quarterly
2. Dickson (1980)	Journal of Applied Psychology
3. Heller & Yukl (1969)	Org. Beh. & Human Performance
4. Long (1979)	Academy of Mgmt. Journal
5. Tannenbaum & Schmidt (1958)	Human Behavior Research
<b>Productivity/Satisfaction not Dependent Variable</b>	
1. Hrebiniak (1974)	Academy of Mgmt. Journal
2. Maier (1953)	Human Relations
3. Mitchell (1973)	Academy of Mgmt. Journal
4. Ruh, White, & Wood (1975)	Academy of Mgmt. Journal
5. Searfoss & Monczka (1973)	Academy of Mgmt. Journal
6. Siegel & Ruh (1973)	Org. Beh. & Human Performance

TABLE 1 (Continued)

Article	Journal
<b>Participation not Clearly Measured/Manipulated</b>	
1. Argyle, Gardner & Cioffi (1958)	Human Relations
2. Calvin, Hoffman & Harden (1957)	Journal of Soc. Psychology
3. Foa (1957)	Personnel Psychology
4. Hoffman, Harburg, & Maier (1962)	J. of Abnormal and Soc. Psychology
5. Levine & Butler (1952)	Journal of Applied Psychology
6. Mahoney (1967)	Management Science
7. Maier & Sashkin (1971)	Personnel Psychology
8. Miner (1979)	Academy of Mgmt. Journal
9. Mulder (1959)	Acta Psychologica
10. Mullen (1965)	Academy of Mgmt. Journal
11. Oldham (1976)	Org. Beh. and Human Performance
12. Pelz (1956)	Admin. Science Quarterly
13. Sadler (1970)	J. of Applied Behavioral Science
14. Shaw & Blum (1966)	J. of Personality and Soc. Psychology
15. Weschler, Kahane, & Tannenbaum (1952)	Occupational Psychology
<b>Methodological Anomalies</b>	
1. Bragg & Andrew (1973)	J. of Applied Behavioral Science
2. Coch & French (1948)	Human Relations
3. Ivancevich (1976)	Journal of Applied Psychology
4. Kidd & Christy (1961)	Journal of Applied Psychology
5. Lawler & Hackman (1969)	Journal of Applied Psychology
6. Roethlisberger & Dickson (1939)	Management and the Worker
7. Schefflen, Lawler, & Hackman (1971)	Journal of Applied Psychology
<b>Data Included through Other Study</b>	
1. Baumgartel (1957)	Admin. Science Quarterly

**TABLE 2**  
**Summary Statistics of Participation Studies Included in the Meta-Analysis**  
**with Satisfaction as the Dependent Variable**

SUBGROUP <sup>a</sup>	N	r	$\sigma^2_r$	$\sigma^2_e$	$\sigma^2_p$	$\chi^2$
<b>Non-Organizational</b>	<b>328</b>	<b>+.3787</b>	<b>.0041</b>	<b>.0134</b>	<b>0</b>	<b>0</b>
Fox (1957)	72	.46				
Gibb (1951)	20	.50				
Katzell, et. al. (1970)	76	.37				
Shaw (1955)	48	.36				
Veen (1972)	40	.37				
Wexley, Singh, & Yukl (1973)	72	.29				
<b>Actual Participation</b>	<b>1691</b>	<b>+.1561</b>	<b>.0083</b>	<b>.0047</b>	<b>.0035</b>	<b>8.19</b>
French, Israel & As (1966)	33	.05				
Ivancevich (1977)	107	-.11				
Latham & Yukl (1976)	41	.02				
Lischeron & Wall (1975)	237	.01				
Morse & Reimer (1956)	201	.22				
Obradovic (1970, 1st estimate)	200	.29				
Obradovic (1970, 2nd estimate)	195	.19				
Obradovic (1970, 3rd estimate)	142	.12				
Obradovic, et. al. (1970)	520	.20				
Seeborg (1978)	15	.11				
<b>Specific Issue</b>	<b>787</b>	<b>+.2119</b>	<b>.0067</b>	<b>.0058</b>	<b>.0009</b>	<b>.78</b>
Alutto & Acito (1974)	75	.27				
Alutto & Vrendenburgh (1977)	197	.15				
Jenkins & Lawler (1981)	58	.34				
Lischeron & Wall (1974)	127	.35				
Ritchie & Miles (1970)	330	.16				
<b>Multiple Issue</b>	<b>3588</b>	<b>+.4558</b>	<b>.0199</b>	<b>.0035</b>	<b>.0164</b>	<b>93.50</b>
Abdel-Halim (1983)	229	.43				
Abdel-Halim & Rowland (1976)	106	.32				
Baumgartel (1956)	180	.17				
Falcione (1974)	145	.23				
Fiman (1973)	170	.32				
House & Dessler (1974, 1st estimate)	82	.40				
House & Dessler (1974, 2nd estimate)	69	.53				
Mitchell, et. al. (1975)	131	.62				
Roberts, et. al. (1968)	6	.47				
Runyon (1973)	110	.26				
Schuler (1976)	353	.36				
Schuler (1980, 1st estimate)	382	.55				
Schuler (1980, 2nd estimate)	429	.50				
Schuler & Kim (1978)	409	.55				
Tosi (1970)	488	.64				
Vroom (1960)	108	.52				
Vroom & Mann (1960, 1st estimate)	28	.54				
Vroom & Mann (1960, 2nd estimate)	24	.31				
Yukl & Kanuk (1979, 1st estimate)	98	.31				
Yukl & Kanuk (1979, 2nd estimate)	41	.12				

a. See the tree diagram in Figure 1 for the successive partition of all studies into the subgroups listed below.

TABLE 3

Summary Statistics of Participation Studies Included  
in the Meta-Analysis with Productivity as the Dependent Variable

SUBGROUP <sup>a</sup>	N	r	$\sigma^2_r$	$\sigma^2_e$	$\sigma^2_p$	$\chi^2$
<b>Goal-Setting</b>	<b>424</b>	<b>+.1138</b>	<b>.0137</b>	<b>.0184</b>	<b>0</b>	<b>0</b>
Dossett, et. al. (1979, 1st estimate)	40	-.07				
Dossett, et. al. (1979, 2nd estimate)	28	.24				
Ivancevich (1977)	113	.24				
Latham, et. al. (1978)	76	.11				
Latham & Marshall (1982)	38	.10				
Latham & Saari (1979)	40	-.12				
Latham & Steele (1983)	72	-.07				
Latham & Yukl (1976)	41	.10				
<b>Field Setting</b>	<b>1193</b>	<b>+.2727</b>	<b>.0044</b>	<b>.0072</b>	<b>0</b>	<b>0</b>
Abdel-Halim (1983)	229	.29				
Abdel-Halim & Rowland (1976)	106	.28				
Fiman (1973)	170	.12				
Jenkins & Lawler (1981)	58	.28				
Neider (1980)	67	.30				
Roberts, et. al. (1968)	6	.47				
Schuler & Kim (1978)	383	.31				
Veen (1972)	40	.33				
Vroom (1960)	108	.26				
Yukl & Kanuk (1979)	26	.37				
<b>Authoritarian vs. Participative Leadership Manipulation</b>	<b>209</b>	<b>-.3333</b>	<b>.0292</b>	<b>.0151</b>	<b>.0141</b>	<b>3.73</b>
Ivancevich (1974)	64	-.54				
Katzell, et. al. (1970)	76	-.21				
McCurdy & Lambert (1952)	21	-.02				
Shaw (1955)	48	-.39				
<b>Assigned vs. Participative Group Manipulation</b>	<b>204</b>	<b>-.0114</b>	<b>.0025</b>	<b>.0196</b>	<b>0</b>	<b>0</b>
French, Kay & Meyer (1966)	92	.01				
Lanzetta & Roby (1960)	18	.10				
Latham & Steele (1983)	48	.12				
Torrance (1953)	22	.00				

a. See the tree diagram in Figure 2 for the successive partition of all studies into the subgroups listed below.

FIGURE 1

Tree Diagram of Studies in the Meta-Analysis  
for Satisfaction as Dependent Variable

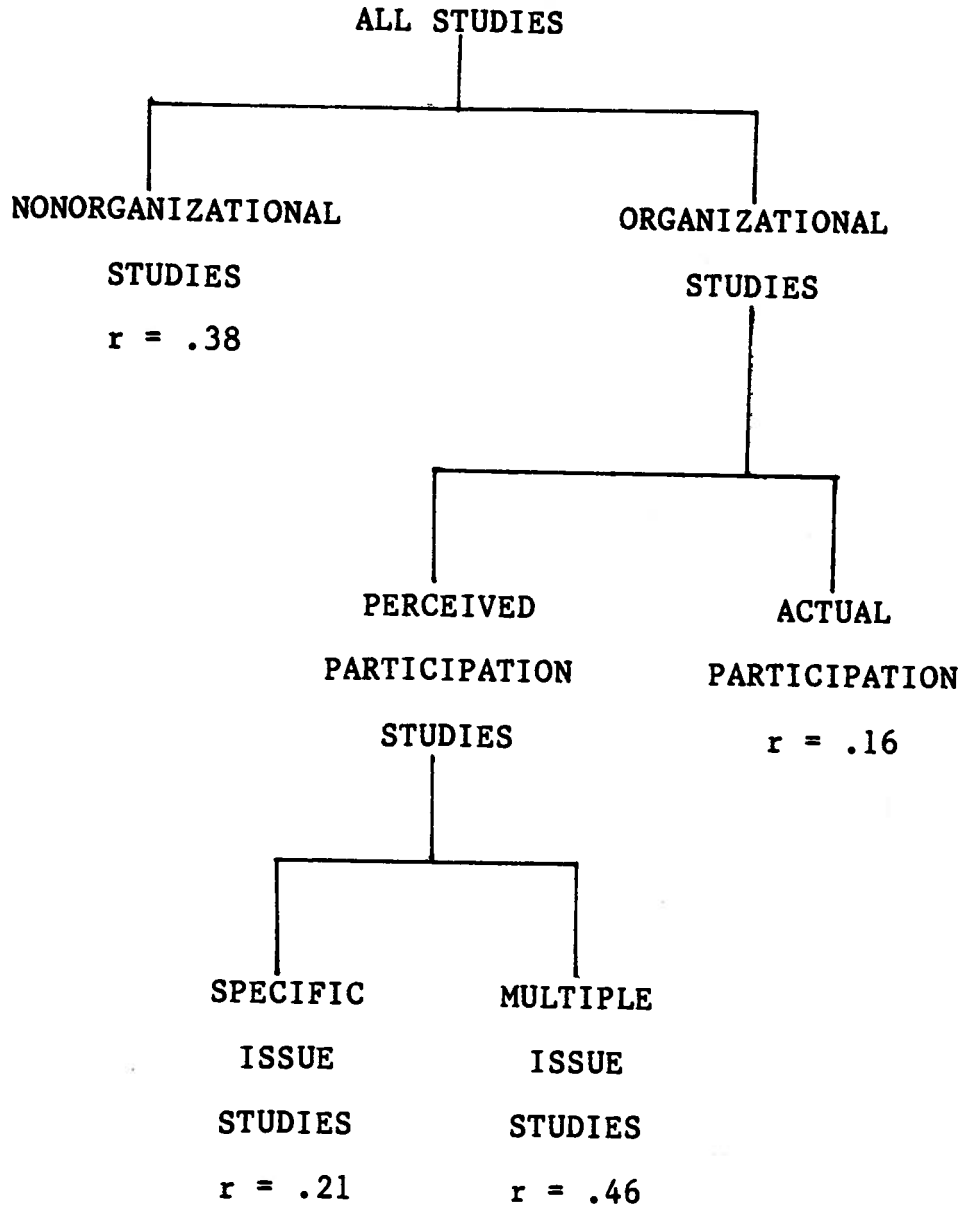




FIGURE 2

Tree Diagram of Studies in the Meta-Analysis for  
Productivity as Dependent Variable

