ENLARGING THE VIEW OF PARTICIPATION IN ORGANIZATIONS: A PROPOSED FRAMEWORK AND ANALYSIS VIA STRUCTURAL EQUATION MODELING

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ABSTRACT

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Enlarging the View of Participation in Organizations: A Proposed Framework and Model via Structural Equation Modeling

Directed by Dr. John Forward, Professor, Department of Psychology, University of Colorado at Boulder

In academic and corporate circles, there is little evidence that employee participation significantly or consistently impacts attitudes or behaviors of workers. This study seeks to clarify the apparent lack of relationship between participation and organizational outcomes by complicating a traditionally simplistic view of participation. Important psychological processes are hypothesized to mediate the relationship between the behaviors of participation and overt outcomes: 1) subjective participation or the employee's interpretation of the meaning of the participatory event, and 2) procedural justice or perceived fairness of change processes. Individual differences of tenure, position in the hierarchy, and general work satisfaction are also hypothesized to play a role in the influence of participatory "opportunities" on organizational outcomes.

A structural model was developed to reflect the hypothesized mediational and control pathways. A sample (N = 361) of public sector employees undergoing a fundamental change in their performance management and compensation system

was used to test the model. Formal systems of participation were being deployed in the organization; therefore, self-report measures of objective participation as well as subjective participation (voice, influence, status and knowledge) were constructed, along with perceptions of fairness, attitudes toward the proposed system and behavioral intentions.

The relationship between objective participation and subsequent attitudes and (intended) behaviors was completely mediated by subjective participation and perceptions of procedural justice. The separation of overt participatory behaviors from the psychological interpretations of employees appears to be warranted and may be an important distinction for organizational research. Two distinct pathways emerged in the analysis: 1) a completely mediated path from perceptions of influence and voice to attitudes via procedural justice, and 2) a partially mediated path from knowledge to attitudes. This suggests an informational function of participation separate from a normative function. In addition, it was found that perceptions of satisfaction significantly influence perceptions of subjective participation and procedural justice, indicating that worker satisfaction levels set the stage for success of participation efforts.

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CHAPTER 1: INTRODUCTION

> "Progress for democracy lies in enhancing the actual freedom, initiative, and spontaneity of the individual, not only in certain private and spiritual matters, but above all in the activity fundamental to every man's existence, his work." Eric Fromm (1941)

Participation or involvement of workers in organizational decision-making (Evans & Fischer, 1992; Hecksher, 1995) is one of the oldest and most frequently studied concepts in the organizational literature (Glew, O'Leary-Kelly, Griffin, & Van Fleet, 1995). With its roots in the fundamental norms and ideals of American democracy, participation is viewed as central to organizational success because it meets basic human needs for meaning and autonomy (Sashkin,1994). By replacing traditional, authoritarian modes of management, participation as a formal management practice is expected to "catapult [organizations] to new heights of customer favor, quality, and competitiveness" (McLagan & Nel, 1995).

Given these lofty expectations, it is not surprising that a recent study of Fortune 1000 companies found that over 70 percent of these firms had implemented a formal employee participation program (McLagan & Nel, 1995) and many contemporary management "guru's" point to participation as a primary source of leverage or competitive advantage in today's turbulent economy (e.g., Kearns & Nadler, 1992; Lawler, 1992; Senge, 1990; Waterman, 1994). Participation is viewed

as a sort of "silver-bullet," a surefire intervention to transform the plodding traditional organization into the fleet-footed, innovative firm of the 21st century. As noted by Pasmore and Fagan (1992), "It is in hope of creating a more energetic, active, and affective organization that many managers turn to participation as an intervention, and sometimes as an end in itself" (p. 382).

Despite, or perhaps because of, these high expectations, the reality of participation often falls short of the rhetoric. Practitioners and academics are perplexed as anticipated productivity gains do not materialize and employee morale plummets rather than soars (Heckscher, 1995; Kane & Montgomery, 1998; McLagan & Nel, 1995; Pasmore and Fagan, 1992). Both are often at a loss to explain how such an obvious positive change such as employee participation cannot have tangible, positive impact both attitudinally and behaviorally for employees, and financially and competitively for the organization.

"Obviousness" of the expected relationship may be the root of the problem. Participation's very status as a "taken-for-granted" construct, as well as its assumed direct relationship to performance, perpetuates overly simplistic interventions and investigations. As noted by Glew, et al., (1995) despite substantial focus and empirical activity, "participation remains an enigmatic construct. Indeed we submit there is no generally-accepted definition, nomological network of antecedents and consequences, standard research framework, or set of operational guidelines regarding participation." The purpose of this study is to develop and test a model of participation that offers a more complex conceptual framework. Specifically, the constructs of procedural justice and the notion of subjective versus objective

participation will be used as a means to better understand where the disconnect occurs between participation and the behavioral outcomes that lead to increased productivity.

The research to-date regarding the linkage between participation and performance will be given a brief overview, followed by a discussion of the nature of procedural justice and its possible role as a mediator between employee involvement and attitudinal and behavioral change. Next, the lack of clarity around the construct of participation in terms of objective behavior and psychological or subjective experience will be examined. Four psychological mechanisms will be offered as possible links between the behavioral acts of participation and subsequent perceptions of procedural justice. Other contextual or influencing factors in these relationships will also be described and tested.

The final product, then, will be a more comprehensive model that complicates the overly simplistic participation-performance relationship by incorporating mediating and control variables that might impact this "obvious" linkage. The model will be tested using data from a governmental agency undergoing a fundamental change in their compensation and performance management system. Rather than asking the simple question of "did participation impact attitudes and behaviors," which has been the predominant question in the last decade of research, this paper will address the more interesting question of "why or why not?" Focus on this question will not only contribute to theory and practice around participation, but will offer further clarity and integration around the

construct of procedural justice – a pressing need articulated by several leading investigators (Greenberg, 1990, 2001; Lind, 2001; Konovsky, 2000; Taylor, 2001).

Participation's Link to Attitudes/Behavior

Glew, et al. (1995) observed that the literature is voluminous regarding the link between participation and numerous employee outcomes such as commitment, satisfaction, performance, motivation, role involvement, decision-making processes/outcomes, physical well-being and emotional stress. However, after reviewing the literature, they were unable to conclude that these links had been firmly established. Roberson, et al., (1999) note that, despite frequent and often vocal claims that participation enhances productivity and attitudes, results of empirical work are equivocal – the impact is typically neither large nor consistent. Wagner (1994), after conducting a meta-analysis of the participation literature, offers the mixed conclusion that, in general, participation does have a statistically significant effect on performance and satisfaction, but the average effect size is too small to be practically significant.

While a few investigators contend that the linkage is, in fact, evident and robust (Sashkin, 1994), most are either neutral or dispute that the linkage exists at all (Pasmore & Fagans, 1992; Roberson, et al., 1999; Taylor, et al., 1995; Yearta, Maitlis, & Briner, 1995). The association of participation with attitudes or, specifically, satisfaction levels seems to be better established than the association between participation and behavior or increased productivity. For example, Miller and Monge (1986) in a meta-analysis of 47 studies report that the mean correlation

between participation and satisfaction is .34 whereas the mean correlation between satisfaction and productivity is .15. Nathan, Mohrman, & Milliman (1991) in a context of performance measurement and goal setting found only a marginal relationship between participation and subsequent performance levels, but did find a significant negative relationship between participation in goal setting and intentions to stay with the firm.

Roberson, et al., (1999) concluded that there is no relationship between performance and participative decision-making. However, they noted, as have several others (Nathan, et al., 1991; Taylor, et al., 1995; Yearta, et al., 1995), that lab experiments are less likely to yield relationships with performance than field studies, primarily because a lab study may not replicate experience of "employees in organizations when important outcomes, such as promotion and career success, are at stake" (Roberson, et al., 1999, p. 592). In general, then, the linkage between participation and employee attitudes (i.e., satisfaction) appears to be more firmly established than the linkage between participation and employee behavior (i.e., productivity), but neither relationship is at the level expected nor does the relationship occur consistently or ubiquitously.

Explaining Inconsistent Practical and Empirical Results

Given the high hopes for and investments in participatory programs, these empirical findings are disappointing to both practitioners and academics. In particular, it is the linkage to productivity that is most relevant to business decision-makers: if investments in these new programs do not reliably result in increased productivity, why continue the investment? Rather than take the unpalatable route

of asserting that participation in decision-making "doesn't work," however, most authors continue to search for reasons why they are not seeing the expected impact in their studies and, subsequently, in the workplace.

This paper suggests that there are three issues that remain largely unaddressed and may partially explain why the expected relationships are not consistently appearing in the empirical literature. These reasons may help explain variable outcomes in applied settings as well, since programs to-date do not always account for these factors. The three issues explored in this study are: 1) complexity of the participation phenomenon, 2) clarity in definitions, and 3) factors that may influence the consequences of participation in natural settings.

Complexity of the Phenomenon

The conclusion drawn by an increasing number of investigators is that previous conceptualizations and frameworks regarding both the construct of participation and its possible relationships with employee and organizational outcomes have been too simplistic. Pasmore and Fagans (1992) asserted that:

> One cannot conclude based on any reasonable review of the literature regarding participation in organizations that simply involving people in decision-making will produce positive benefits to either those involved or the organization as a whole. We would go so far as to argue that currently popular interventions, such as self-directed work teams and quality programs, continue to fall short of their full potential in many instances due to *a failure to recognize the complexity* of the participation process (p. 378, emphasis mine).

They call not only for increased sophistication in the definitions of participation, but a greater understanding of the mediating processes and variables that might account for the impact or lack of impact of participation on organizational outcomes. Glew, et al. (1995) echo this call and suggest that investigators look beyond simple participation-outcome relationships and develop more complex nomological/theoretical models.

Clarity in Definitions

Korsgaard & Roberson (1992) also suggest that failure to recognize the complexity of participation is an underlying problem in both academic and practitioner settings. However, they point to lack of clarity in definition of both independent and criterion variables as an additional barrier to consistent findings and outcomes. They note that investigators oftentimes attempt to link measures of highly constrained or specific participatory behaviors with broad, global attitudes toward management or that measures of participation tapping team or group level behaviors are linked with individual performance measures. Given the disconnect between the type of participation and the measured outcome, it is not surprising that "practically insignificant" associations are found.

Glew, et al. (1995) note that many studies of participation use rather shallow assessments via single or dual item scales. More germane to the proposed model, they suggest that investigators need to be more attentive to the underlying motives behind programs – is the motive to institute authentic participation or placate employees? As will be discussed later, the concept of objective participation (i.e., behavior or acts of participation such as going to a team meeting) needs to be

separated from the concept of subjective participation (i.e., the act or behavior is psychologically meaningful as authentic participation or is simply an exercise in "going through the motions"). If the employee does not feel or believe that s/he has truly participated, it is unlikely that strong linkages will exist between their act of participation and subsequent attitudes or behavior.

Influencing Factors

In addition to the issues of theoretical complexity and conceptual clarity, others suggest there is a paucity of knowledge regarding the contexts and conditions under which participation is facilitated or hindered (Glew, et al., 1995; Locke & Schweiger, 1979). Locke and Schweiger in a study of participatory decision-making (PDM) note that the "consistency with which the results of PDM studies fail to show any clear trend with respect to productivity (and to a lesser extent with respect to effects on morale) leads to only one possible conclusion: there is a great deal we do not yet know about the conditions under which PDM will 'work'" (p. 316).

The search for relevant influential factors at organizational and individual levels is perhaps the most visible pursuit in participation research (Glew, et al., 1995). There has been a literal avalanche of possible variables suggested and tested in order to better replicate the "real world" situations under which participation might operate. As of yet, there appears to be no coherent picture of which factors are most relevant (or even if the most relevant have been identified) or, more importantly, what their influence might be on the participation-attitude or participation-behavior relationship.

In empirical terms, the above three issues involve investigations of: 1) mediation, 2) measurement, and 3) control/context variables respectively. The remainder of this review will propose specific factors or variables to address these gaps in the participation literature. Specifically, it is suggested that: 1) the concept of procedural justice is a critical mediating factor, 2) separation of objective and subjective participation will clarify the measurement effort, and 3) overall job satisfaction, position in the organizational hierarchy, and tenure in the organization are significant control variables influencing the participation-outcomes relationship.

Procedural Justice as a Mediator of the Participation-Outcome Relationship

It is beyond the scope of this paper to provide a thorough or even superficial review of the literature around procedural justice (PJ). The amount of research conducted on this topic or the broader topic of organizational justice over the last decade is truly staggering. The interested reader is referred to several review articles that discuss the evolution and development of PJ as a construct (Colquitt, 2001; Colquitt, et al. 2001; Cropanzano, Byrne, Bobocel, & Rupp, 2001; Greenberg, 1990) as well as work linking it with various outcome variables including its companion concept, distributive justice (Robbins, Summers & Miller, 2000; Konovsky, 2000). For purposes of this paper, only a few key ideas will be highlighted before moving directly into the proposed role of PJ in the participation-outcome relationship.

The Construct of PJ

Per Robbins, et al. (2000) the economic exchange concept of distributive justice (DJ) or "the perceived fairness of the amounts of compensation and other

outcomes received" was joined in the mid 80's by the more psychological concept of procedural justice (PJ). Work by Folger & Greenberg (1985), Greenberg & Tyler (1987), and Lind & Tyler (1988) solidified the construct in the organizational literature. In contrast to the "how much do I get" focus of DJ, the emphasis of PJ is on the "how" of the "how much" decision process. If decision processes and procedures around the "how much" or outcomes are perceived to be fair, the outcomes themselves are more likely to be perceived as fair, even if the outcomes are unfavorable or not overtly in the best interests of the individual (Greenberg, 2001; Greenberg & Folger, 1983; Konovsky, 2000; Magner, et al., 1992; Tyler & Smith, 1999).[1]

Perceptions of PJ have been associated with important consequences in employee attitudes and behavior, e.g., job satisfaction, organizational commitment, organizational citizenship behavior, and turnover intentions (Konovsky, 2000; Robbins, et al., 2000). Per Moorman, 1991 (quoted in Robbins, p. 1333): "In essence, the belief of researchers who support the value of organizational justice is that if employees believe that they are treated fairly, they will be more likely to hold positive attitudes about their work, work outcomes, and supervisors." The persistent relationship between PJ and organizational outcomes is in stark contrast to the fickle relationship of participation to similar outcomes.

[1]As is the custom in most work in this area, the terms justice and fairness will be used interchangeably. It could be argued that these terms are not synonymous and that distinctions between perceptions of justice and fairness may have differential antecedents and consequences. Resolution of this issue will be left to a future study and default to tradition for purposes of this paper.

Role as a Mediator

The concept of participation has already been associated with PJ, most often as an antecedent to perceptions of fairness or justice. For example, Yearta, et al., (1995) note that "researchers who have found a positive relationship hypothesized that allowing participation in the goal setting process increases an individual's perception of control and fairness which subsequently leads to greater goal performance" (page number unavailable, online version). Roberson, et. al. (1999) also report that "studies have shown participation through voice, choice or both to influence perceptions of procedural justice."

What is interesting is that the link between participation and procedural justice is made primarily within the PJ literature and, until recently, has not been leveraged in the participation literature as a possible explanatory variable. In effect, the two literatures have been running in parallel and the usefulness of the justice concepts have only begun to percolate into models of participation. Lind and Tyler (1988) noted over a decade ago that procedural justice research could help explain the complexity seen in participation effects, but only very recently have studies appeared that explicitly examine the role of PJ in the association between participation and subsequent attitudes and behaviors. For example, a study conducted by Kirkman, Shapiro, Novelli, & Brett (1996) regarding employee concerns about a participation program (self-managed teams), is suggestive of a mediating effect, as it was found that justice concerns were highly salient in employee perceptions of participation and expected outcomes. The mediating role of PJ was not explicitly hypothesized nor tested, however.

In the review of the literature for this paper, only one study was identified that directly tested the mediating effect of PJ in the participation-outcome relationship (as opposed to considering participation to be a moderator of the PJ-outcome relationship). In their review of the literature, Roberson, et al., (1999) note that numerous studies show that opportunity to provide input into a decision impacts individuals' perceptions of the fairness of the process while other studies provide evidence of a positive relationship between these justice judgments and affective responses. They connect these previously disconnected findings and test a simple model:

Participation ---------> PJ ---------> Satisfaction

using college undergraduates and a class scheduling task. Their analysis via a structural equation model found that the direct path from participation to satisfaction was not significant, but that a mediated or indirect path via PJ was significant. They claim that the relationship between participation and perceptions of satisfaction with the task is completely determined by perceptions of procedural justice.

These preliminary findings suggest that research into a mediational role of PJ may help resolve the stalemate in the participation literature. However, in addition to using a contrived situation with a college sample (calling into question the generalizability to situations when real outcomes such as pay are at stake) the above model remains overly simplistic, and still leaves open the question of what is meant by "participation:" is it enough to ask people to provide input or must there be an evaluation or judgment about the meaning of this overt behavior?

Measurement and Meaning of Participation

> "Participation is a feeling on the part of people, not just the mechanical act of being called in to take part in discussions." (Lawrence, 1954/1986, p. 36).

Even a cursory review of the participation literature reveals that a number of scales purporting to measure participation are used and there appears to be little, if any, consensus regarding what to measure, much less how to measure it. Glew, et al. (1995) describe a range of definitions and measures including joint decision-making, influence sharing, representation, and involvement. They note that some academics and practitioners have viewed participation as a singular practice or program, others frame employee involvement as an overarching management philosophy or leadership style, while yet others view participation primarily as a political/ideological stance. They further suggest that many studies of participation do not even include a direct measure of participation but use surrogates such as autonomy, empowerment, or manager/supervisor perceptions of participation by employees. Magner, et al., (1996) have operationalized participation as procedural justice; in effect creating a six-item scale that blended reports of participative behaviors with perceptions of fairness and influence.

Most research and practice, however, seems to focus on relatively specific behaviors in constrained contexts: did workers fill out a survey about the new compensation program? Did they participate in the quality circle for revised shop floor practices? Did they feel represented at the latest management meeting? Have they discussed their performance goals with their supervisor? Etc. Clearly, the type

and content of the scale used will impact results of analyses with various outcome measures. More critically, the depth and breadth of participation activities or events themselves will likely impact the level and nature of attitudinal and behavioral outcomes. Glew, et al. (1995) suggest that if there is limited participation we might expect limited effects and, further, that representation alone is no guarantee of participation. Pasmore & Fagans (1992) similarly question if the "opportunity" to participate can be equated with meaningful participation.

Subjective/Psychological "Real" Participation

Several investigators have suggested, albeit almost parenthetically, that if participation events are purely symbolic (Konovsky, 2000; Magner, 1996) or provide only "safe" opportunities for employees to participate (Pasmore & Fagans, 1992), employees are unlikely to exhibit the desired attitudes and outcomes. In fact, these investigators appear to agree with Magner's observation that: "participation that is seen as a sham is unlikely to have salutary effects found in this study, but may instead foster maximal resentment on the part of employees. ...and result in strong negative feelings for toward those responsible for such practices" (1996, p. 141).

The critical theory literature is more vocal about these "pseudo-participation" efforts. Salvador & Markham (1995) describe a case where "a rhetoric of self-directive management served to obscure relations of power and conflicting political interests." They assert that management "espoused a philosophy of self-direction" but enacted practices of severe criticism when employees did not meet unstated expectations. Dean, Brandes, & Dharwadkar (1998) cite their experience with MBAs who respond to the concept of teamwork as: "could see the benefits of

teamwork *in theory*, but perceived it, *in practice*, as merely a slogan used by their organizations to appear progressive, without changing anything about how work actually gets done" (p. 342, emphasis mine). According to Deetz (1995), "despite the best intentions or efforts of management control is never completely disguised, thus stakeholders can become even more completely disillusioned as they participate in these programs" (p. 49). In effect, the mixed message to employees is often: you can participate, but we're really calling the shots.

It could be argued that it is the subjective impressions of participation that are key in predicting attitudinal or behavioral outcomes: if the employee does not feel or believe that their participation in the team meeting is "real" or that the new process for performance evaluation is jointly determined, objective or intended participation will be irrelevant in subsequent attitudes.[2] Separating management from front-line perspectives around the new participation program is essential. Too often, studies assume that the program has been implemented and is being perceived as intended. As one State of Colorado employee stated:

> "The intent of CPP is to implement a better and fairer system? But, bottom-line, it's intent. That isn't worth much in my book, because most of the time, the intent doesn't happen in the follow-through and implementation." (Sikora, 1998)

[2] It has been argued elsewhere (Sikora, 2001) that employees can and do "go through the motions" to appear as though performance and attitudes are in sync with corporate desires; the full potential for innovation and enthusiasm remains unrealized, however, as the efforts of the employee are as symbolic as the programs or managerial "techniques" imposed on them. For purposes of this study, it is assumed that employee attitudes and behaviors are not cynically scripted to "play the game" of participation, i.e., perceptions will match-up with overt/expressed attitudes and behaviors. Clearly, if results of this analysis are not as expected, this is a viable alternative explanation that will require modification of the proposed model.

For this study then, separate measures of objective participation behaviors (participation in meetings, discussions with supervisors) and subjective participation perceptions will be established. The simple model above then expands to:

Po ---- > Ps ----- > PJ ----- > outcomes

where Po is objective participatory behaviors or events and Ps is the employee's subjective impressions or perceptions of the meanings of those events. In other words, subjective or psychological participation will mediate the relationship between overt involvement behaviors and subsequent perceptions of PJ. This separation begs the question of what kind of subjective perceptions or psychological mechanisms might be involved in the transition from a participatory behavior to perceptions of PJ.

Four Pathways Between Participation and PJ

A review of the participation and PJ literature suggests four pathways that might bridge the objective experience of participation and the subjective perception of PJ. Interestingly, while these four concepts are present in varying degrees and levels of development in both literatures, there has been no effort to-date to unify the two literatures around these frameworks. These common themes are:

1. *Voice* as a normative ideal or social value;
2. *Influence* over outcomes as critical in exchange relationships;
3. *Status* as a indicator of worth as a member of the social group; and
4. *Knowledge* as a means toward goal attainment via information exchange or persuasion.

Literature on both participation and PJ literature will be drawn upon in order to more fully describe the nature of each pathway. As summarized below, these four psychological experiences are often positioned not only as consequences of participation, but also as antecedents of procedural justice. It seems reasonable, then, to consider them as alternative, but not necessarily mutually exclusive, paths linking together objective participation (Po) and procedural justice (PJ) in the above model. That is, these four mechanisms might be used as measures of subjective participation or psychological meaningfulness of employee involvement in decision-making.

Voice

For many Americans, voice is participation; i.e., the opportunity to provide input, speak one's mind, or to dissent is core to the very definition of participation whether in the workplace or in the world. According to Pasmore & Fagan (1992), the roots of participation in organizations are in the democratic norms articulated by ancient philosophers such as Socrates and Plato. Plato's view, however, was of a democracy limited to landholders and this became the "democracy" preferred by the elite of Europe (and arguably, of managers in traditional Western corporations). De Tocqueville (1835/1956) observed and applauded the promise of true equality in American democracy: every citizen could be a full participant and involvement of the many reduced manipulation of government by the few. This, of course, is the fundamental social norm of American culture as formalized in the Declaration of Independence, Constitution, and Bill of Rights. Participation in the form of voice is

normative for our culture – providing input is an expression of the values of the "American way."

In organizational settings, the norms of voice were superseded by more elite and authoritarian management styles through the middle of the 20th century (McLagan & Nel, 1995). With the influx of Japanese teamwork and the Total Quality Management or "TQM" movement, the concept of worker involvement gained credence in the American workplace – not necessarily because it was normatively right, but because it became apparent that competitive advantage was moving into Western marketplaces via Eastern innovation and cost leadership (McLagan & Nel, 1995; Deetz, 1992, 1995; Schoenberger, 1997). Despite its Eastern origins, worker participation took on the normative tone of American democracy and the belief that participative programs would "of course" result in productivity gains took hold in practice and academia. As noted earlier, results of participation interventions or "employee input opportunities" have been inconsistent at best.

Paralleling work in the participation literature, Folger (1977) introduced the concept of the "voice effect" in the organizational justice literature. According to Lind, Kanfer, & Early (1990), the positive impacts of the opportunity to provide input into the decision-making process is "probably the best-documented phenomenon in procedural justice research" (p. 952). Per Magner, et al. (1992, 1996), the most frequently studied antecedent or criterion for a fair decision-making procedure is voice and with very few exceptions, most studies report positive voice effects on PJ. Others (Greenberg, 1990; Konovsky, 2000; Lind, et al., 1990; Lind &

Tyler, 1988) have also concluded that voice or the opportunity to provide input consistently heightens perceptions of PJ and, consequently, improves employee acceptance of decisions.

It is important here to differentiate this concept of voice as a cultural norm from other concepts of voice emerging in the literature. The literature around voice is, in fact, quite cluttered as voice has been conceptualized as influence over decisions as well as symbolic of group membership or status (Folger & Konovsky, 1989; Korsgaard & Roberson, 1995; McFarlin & Sweeney, 1998; Lind, Kanfer, & Early, 1990). This separation appears in contemporary discussions about the instrumental versus non-instrumental value of voice where instrumental effects are hypothesized to occur when voice offers perception of indirect control or influence over outcomes and non-instrumental effects occur when voice is intrinsically valued regardless of influence as it reflects one's status in the group (Coquitt, 2001; Korsgaard & Roberson, 1995; Lind, Kanfer, & Early, 1990; Tyler, 1999).

Perhaps using the term "voice" to describe these multiple effects muddies. rather than clarifies, the conceptual waters around procedural justice as well as participation. For purposes of this paper, the concept of voice will be used exclusively to describe the normative expectations around democracy and leave concepts of influence and status to stand for themselves, as described in the next paragraphs. In effect, voice in the above context is valued as an end to itself, as symbolic of cultural norms and expectations around democracy as a social good. Voice as means to an end may be fundamentally different than voice in the form of

influence (means to material or social exchange outcomes) or as a symbol of status (means to a psychological gain in the form of self-esteem).

Influence

The opportunity to influence a decision may be qualitatively different than the opportunity to provide input into a decision (voice as described above). The notion of influence implies the desire or ability to control outcomes, whereas the normative concept of voice does not necessarily include this expectation: the opportunity to speak is enough in itself. The role of influence in the participation literature is well established. Per Magner, et al., (1996) "influence in decision making is a key concept in explaining why participation works to assuage the negative attitudes created by unfavourable outcomes." According to this view, employees or other individuals look at participation as a means to better secure their own outcomes. Even if those outcomes are not favorable, at least participation has improved their odds over and above not participating at all.

The PJ literature on influence hinges on the "process control effect" outlined by Thibaut and Walker in the mid 1970s. Thibaut and Walker (1975) examined the distribution of control among disputants and decision makers in dispute-resolution situations. They found that when the perceived distribution of control is skewed toward participants, individuals are more likely to characterize the procedure as fair. They further concluded that people prefer procedures that maximize their own outcomes, therefore, the process control effect goes beyond simply wanting the opportunity to speak and is more directly related to the desire to maximize personal outcomes or minimize costs (Konovsky, 2000).

Also described as the self-interest and/or instrumental model (Colquitt, 2001), the process control effect, like the voice effect above, has consistently shown robust linkages to perceptions of fairness and favorable attitudes toward even unfavorable outcomes (Greenberg, 2001; Greenberg & Folger, 1983; Konovsky, 2000; Magner, et al., 1992; Tyler & Smith, 1999). Greenberg (2001) notes: "to the extent that people have exercised at least some control over the process that determine salient outcomes, they are likely to accept those outcomes, even when these are undesirable" (p. 215).

The descriptions of findings in the PJ literature mimic those in the participation literature. However, in the participation literature influence is clearly viewed as a consequence, whereas in the PJ literature influence is often positioned as an antecedent to PJ perceptions. In both literatures, the linkages are robust, so we might expect perceptions of influence to be powerful mediators between the two concepts. That is, if participation is not subjectively experienced as influential, but viewed as a "sham," the link between participation and PJ may not occur. In fact, there may be a negative association such that inauthentic participation "opportunities" reduce perceptions of PJ, even if these opportunities objectively appear to offer employees control over decision outcomes.

Status

According to Tyler and Smith (1999) participation can be viewed as a relational symbol. That is, including employees in decision-making sends a strong 'we' message: you are now part of the "ingroup" that makes decisions about how the firm operates. Participation, then, not only provides overt opportunities for voice

or influence, but sends more subtle messages about inclusion and status as a group member. According to the group-value model (Tyler, 1989; Tyler and Lind, 1988), "treatment communicates identity-relevant information and, in turn, this information shapes people's reactions to their experiences" (Tyler & Smith, 1999, p. 240). Further, messages of identity and inclusion are posited to be motivational; i.e., perceptions of group membership and "full" status motivate group-oriented behaviors, conforming behaviors as well as assertive "above and beyond" efforts (Albert & Whetten, 1985; Ashforth & Mael, 1989; Barker, 1998; Kramer, 1993, 1996; Shapiro & Schall, 1990). Status in this framework is not synonymous with hierarchical status or power, but is simply status as "in" or "out" of the social group (Lind, 2001).

Group-value theory is not yet visible in the participation literature, however, and most of the discussion around the relevance of identity or status is found in the PJ domain. Specifically, the group-value model suggests that fair procedures are indicators of the value of long-term relationships and group membership and reflect positively on the group and individual status as members of the group (Konovsky, 2000; Magner, et al., 1992; Tyler, 1999; Tyler, Degoey, & Smith, 1996; Tyler & Lind, 1988). Core to the group-value model are relational judgments, which hinge on identification: the more strongly identified the individual is with the larger social entity, the more strongly these relational factors should influence perceptions of PJ. Per Tyler and Smith (1999): "If people are concerned about the implications of treatment for their identity, they should be impacted by relational issues, independent of judgments about the favorability of their outcomes" (p. 231).

Specific relational judgments that communicate group membership and are hypothesized to impact perceptions of fairness are neutrality, trustworthiness, and standing (Konovsky, 2000; Tyler, 1989; Tyler and Lind, 1988; Tyler & Smith, 1999). Neutrality or lack of bias/favoritism implies an even playing field in which no group member is "more" a member than anyone else. Trustworthiness is critical, as oftentimes outcomes are intangible and/or are projected to materialize in the distant future; trust implies that intentions are honorable and the "we" will prevail over self-interests of specific individuals. Standing is communicated with respect and courtesy, as well as being treated in a dignified manner as behooves a "full" member of the group.

These non-instrumental assessments (Lind, Kanfer, & Early, 1990; Tyler, 1999) of organizational processes and procedures send messages about the employee's status as a valuable or worthwhile member of the group. These perceptions of worth have often been associated with favorable assessments of the fairness of outcomes with or without favorable personal consequences (Cropanzano, et al., 2001; Huo, Smith, Tyler, & Lind, 1996; Konovsky, 2000; Lind, et al., 1990; Tyler, 1999; Tyler, Degoey, & Smith, 1996; Tyler & Lind, 1988).

Opportunity to present information during decisions conveys that superiors are concerned about worker attitudes and indicates that an employee is a valued and "full-fledged" member of the organization (Lind, et al., 1990; Lind & Tyler, 1988). If the participation opportunity is accompanied by subjective perceptions of neutrality, trust, and respect or dignity, we would expect perceptions of PJ to be positively impacted. Conversely, if the participation opportunity is executed in such

a way that workers feel the "deck is stacked," intentions of authorities are suspect, or there is inadequate respect accorded to worker opinions, perceptions of PJ will be deflated and the motivational impact on subsequent behaviors will not be evidenced. Again, the subjective meaning of the participation event(s) weighs more heavily on subsequent attitudes and behaviors than does the objective act of participation itself.

Knowledge

In early discussions of participation, investigators and practitioners noted that participation offered management an arena in which to educate workers and help them understand the importance of pending changes (Coch & French, 1948; Lewin, 1948, 1951; Pasmore & Fagans, 1992). Critical theorists have recently criticized contemporary forms of this model, however, noting that what was intended as a mechanism for joint information sharing and equalization of power has been co-opted as a covert form of persuasion, i.e., a top-down management tool, rather than as an opportunity for workers to provide input or influence the decision process via "bottom-up" processes (Deetz, 1992, 1995). The use of participation as a means of achieving "buy-in" to a priori management definitions or goals is not what was originally envisioned by Lewin and his associates.

On a more positive note, rather than being positioned as a means of persuasion, some investigators are now viewing participation as a means to enhance worker self-efficacy via improved quality and quantity of information regarding tasks and processes. Work by Locke, Latham & Erez (1988) found that the process of participation, in the form of discussion around goal-setting, provides needed task and role information that, in turn, facilitates job performance. Following Locke, et

al. (1988) others have confirmed that joint discussion or sharing of information provides workers with greater role and task clarity, thereby facilitating feelings of self-efficacy and more positive attitudes about the work and organization (Lind, et al., 1990; Taylor & Pierce, 1999; Yearta, et al., 1995).

The provision of information, explanations, or justifications (Bies & Moag, 1986; Colquitt, 2001; Greenberg, 1990, 1993; Konovsky, 2000) for goals or policy changes has also been found to impact perceptions of procedural justice or fairness; i.e., the "information effect" or justification has been noted as a plausible explanation for favorable responses to overtly unfavorable outcomes. Konovsky (2000) notes that factors such as communication, explanation, and understanding have often been shown to positively influence reactions to various incentive and compensation plans, as well as larger outcomes such as organizational commitment, turnover intentions and satisfaction (Dulebohn & Martocchio, 1998; Cooper, Dyck & Frohlich, 1992; Welbourne, Balkin, & Gomez-Mejia 91992); Lee, Law & Bobko, in press; Schaubroeck, May & Brown, 1994).

Summary of Four Pathways

Based on review of the literature in participation and PJ, four themes are identified that appear to connect or potentially connect the two constructs. In the case of participation, these concepts are often described as outcomes or consequences of employee involvement, whereas in the PJ literature, these same four items are often described in terms of antecedents to perceptions of fairness.

Table 1: Summary of Four Themes in Participation and Procedural Justice Literature

Theme	Origins	Theory-base	Psychological Influence
Voice	De Toqueville, 1935	Democracy	End to itself as social good
	Folger, 1977	Voice effect	End to itself as norm/value
Influence	Thibaut & Walker, 1975	Process control	Means to material outcomes
Status	Tyler & Lind, 1988	Group-value	Means to psych outcomes (self- worth)
Knowledge	Deetz, 1992	Persuasion	Means to someone else's goals
	Locke, et al., 1988	Info exchange	Means to goal achievement

These themes can be thought of as connecting pathways between the act of participation and subsequent perceptions of PJ. For example, having an opportunity to provide feedback in a group meeting about a proposed policy change satisfies employee normative expectations for democracy, which then leads the employee to evaluate the process of policy development to be fair. The resulting policy is then viewed favorably and the employee more willingly complies with the new expectations. Conversely, if the group meeting is viewed as a "sham" or management's attempt to "go through the motions" of obtaining employee feedback, the psychological experience will be that norms of democracy have been violated ("they're not really interested in our opinions"). The process then, even though overtly fair, will not be viewed as such by the employee and subsequent policy decisions will not be viewed favorably nor will there be enthusiastic commitment to the new expectations.

The key is that the same objective participation opportunity can be viewed subjectively as authentic or inauthentic (did I really have a chance for input?) and it is this subjective assessment that drives subsequent evaluations. Management's frustration at employee lack of enthusiasm for new programs, "even though we gave them a chance to be involved," may hinge on the fact that from the employee perspective, the opportunity was superficial. While the example above focused on the Voice pathway, there is no reason that this assessment cannot occur around knowledge (yeah, they gave us information, but it was incomprehensible), status (they treated us like children), or influence (they offered us a choice, but they did what they wanted anyway). Which pathway or pathways are utilized under what conditions is an empirical question; the primarily focus of this study is to establish that one or more of these pathways mediates the relationship between reports of participation and subsequent PJ assessment.

"Over and Above" Influences on Perceptions: Contextual Factors

After finding no or inconsistent relationships between participation and various outcomes, several investigators (Roberson, et al., 1999; Pasmore & Fagans 1992; Glew, et al., 1995; Greenberg, 2001; Schimke, Ambrose, Cropanzano, 2000) have suggested that the focus of investigation turns to questions of the organizational and individual factors that may influence this relationship. Glew, et al., (1995) provide a virtual laundry list of factors suggested as potential influential factors; e.g., individual difference variables such as the need for autonomy, authoritarianism, locus of control, self-efficacy, ability, demographics, willingness to participate and

organizational factors such as organizational size, profit-making orientation, desired level of decision quality, subordinate development, corporate culture, organization structure and industry type. Schimke, et al. (2000) in a study of the effect of organizational structure on perceptions of fairness tested three organizational factors – centralization, formalization and size – and found negative relationships between justice perceptions and centralization and size, but no relationship with formalization.

Based on this literature review, as well as informal discussions with employees in work settings over the last 15 years, it can be argued that many studies of participation treat the phenomenon as though it were occurring in a vacuum, i.e., as though participants had no previous experience in organizations or exposure to other managerial interventions. Only now is work being conducted to test the influence of organizational or employment contexts on procedural justice perceptions. As we move into applied settings and situations in which we are evaluating the efficacy of interventions in real workplaces, the history and orientation of employees must be accounted for in assessing responses to specific participation events. At least three individual factors will potentially impact the effect of participation on subsequent attitudes and behaviors: overall satisfaction with the workplace, tenure in the organization, and position in the hierarchy.

Current Satisfaction and Commitment

Per Robbins, et al., (2000) most studies use global attitudes toward the organization as dependent or criterion variables; i.e., specific practices or interventions are hypothesized to impact these global work assessments. However,

they suggest that it is entirely plausible that these global attitudes could set the stage for responses to managerial decisions or practices. That is, these more global, experience-based attitudes can serve as the foundation for not only evaluations of specific organizational events, but as the lens through which these events are perceived.

For example, an employee who is very satisfied with the workplace and committed to the organization is likely to have a different perception of a proposed policy change than would an individual who is dissatisfied with their job or feeling alienated from the company. Those who are more committed or satisfied in general may be predisposed to more favorable assessments of specific organizational practices: they expect to see good things in their company and may selectively include or exclude specific information components with which to form a judgment of "what is going on here." In this study, especially because we are looking at employee perceptions of events that may occur in the future, satisfaction and commitment to the organization today could directly impact these "down-the-road" responses with or without a tangible experience of participation or perceptions of procedural fairness. That is, the question becomes: does participation impact subsequent evaluations/perceptions over and above current global attitudes of satisfaction with the organization?

Tenure in the Organization

Today's employees have been buffeted by a variety of managerial techniques and programs: quality circles, TQM, empowerment, ownership, customer care, customer-centricity, teams, self-directed work groups, etc., are familiar elements of

today's corporate landscape. It is unlikely that any employee with more than five years work experience has not been directly or indirectly exposed to one or more of these interventions and, more importantly, its results. Evaluation of the next program or event cannot help but be influenced by past experiences or exposures to overtly similar interventions.

Glew, et al. (1995) suggest that repeated experiences with participation activities may lead to generalization of attitudes, suggesting that length of career or tenure in an organization may be linked to established attitudes about participation or likelihood of fair procedures or outcomes. Robbins, et al. (2000) found that "employees' perceptions of changes...will be biased by their previously held attitudes. As a result, managers may find it difficult to overcome already established perceptions of justice...Furthermore, prior perceptions of inequity may not be forgotten and will have some influence on later reactions, regardless of whether the injustice was resolved." Korsgaard and Roberson (1992) similarly report several studies that suggest that the usually robust voice effect persists but weakens over repeated exposure to unfavorable outcomes.

Many studies of participation assume that employees have amnesia or that they are entirely removed from mainstream corporate life. Exposure to events in one's own organization would likely impact perceptions of the next program or policy. Assuming that there is some consistency over time across corporate decision-making and practices, those with more experience or exposure to corporate planning, procedures, and outcomes would likely have a priori attitudes regarding

the viability or veracity of proposed changes over and above participation or involvement experiences.

Position in the Hierarchy

Contemporary management literature is remarkably mute on issues of power and status. There is the implicit assumption in many studies that new organizational forms and practices have evened the playing field and worker responses to organizational events will be similar to those of management. That is, once everyone is empowered and participating, status and power are equalized across the system and become constants in any assessment of attitudes or behaviors for different employee groups. This may be a rather naïve assumption and power differences related to hierarchy in the organization remain influential in how individuals perceive and evaluate corporate events.

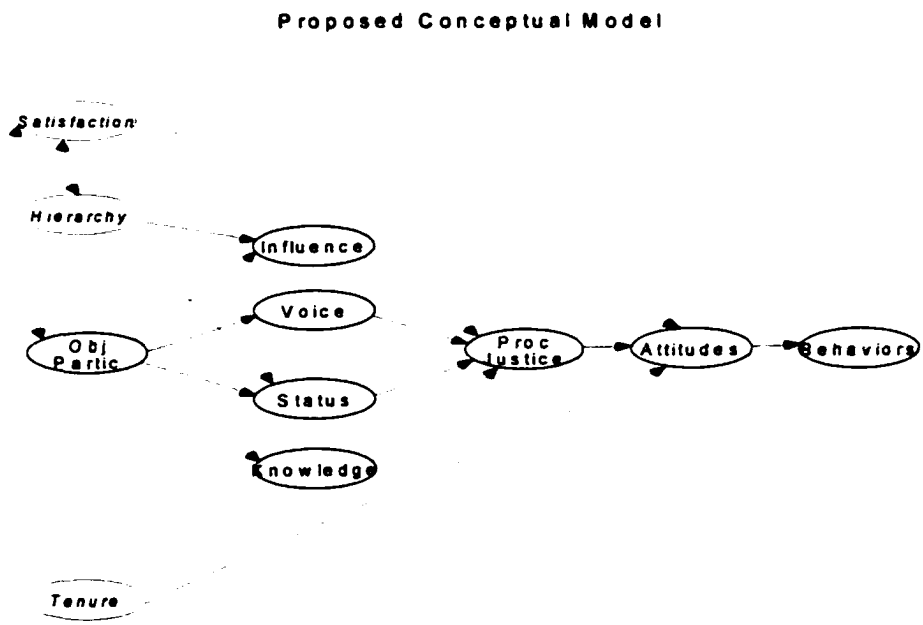
For example, it is very likely that a manager or supervisor will feel that s/he has influence over decision-making, whether or not they "officially" participate in a specific decision-making process, and resulting attitudes or expectations about a pending change will be more favorable than for a secretary or shop floor worker. Consistent with the "even playing field" theme in the literature, there were no "mainstream" management studies found that describe the potential role of status or power in the participation-outcome relationship. It is, in fact, rare for an investigator to include more than one level of employee in the study; i.e., studies either focus on managers or workers, but rarely both. Given the day-to-day relevance of the job hierarchy, even in the flattest of organizations, position in the hierarchy may influence subjective participation perceptions, specifically status as "we" and overall

sense of influence and control, thereby positively impacting perceptions of fairness and evaluation of proposed changes, over and above objective participation.

Summary: Proposed Conceptual Model and Hypotheses

Below is a visual representation summarizing the variables and relationships outlined above, followed by the hypotheses guiding this research. There are clearly other plausible linkages and relationships that could explain the impact of participation on attitudes and behavioral intentions. Several of these will be explicitly laid out in the Results section ("Structural Model Specification") as a priori models for testing. Please see the Methods section for operationalization of variables in the model.

Figure 1: Proposed Conceptual Model



H1: Procedural justice perceptions will directly influence attitudes toward the proposed change, which will, in turn, mediate behavioral expectations specific to the change.

Tyler & Lind (1992) suggest that PJ may have behavioral effects because it increases legitimacy of the implementing organizational authorities and, therefore, willingness to comply with goals of organization. However, reviews of PJ literature (e.g., Lind and Tyler, 1988) imply that behavioral changes are less consistent than attitudinal effects. Earley (1984) noted voice improvements in performance and attitudes, but in later work with Lind (1987) determined that the performance effect was limited to lab settings. Taylor, et al. (1995) observe that actual behaviors are hard to predict because they are multiply determined by attitudes, ability and motivation, as well as the opportunity to act. However, they also claim that "employees' reaction to the fairness and accuracy of the appraisal system may affect their motivation to correct weak performance or develop unused potential." They conclude that impacts on employee motivation to improve performance may be a more reasonable dependent variable than actual behavior.

Positive attitudes are no guarantee of desired behaviors, but they appear to be a reasonable step in that direction. Also, since this study preceded implementation of the organizational change (see "Context" in the Methods section), it seems appropriate to assess how attitudes about future events influence the degree to which employees are inclined or motivated toward the behaviors consistent with the proposed change.

H2: Procedural justice perceptions will mediate the relationship between subjective participation and desired attitudes.

This is a central hypothesis regarding the mediational role of procedural justice in the participation-outcome relationship. The above model suggests that the relationship is fully mediated by procedural justice; that is, perceptions of procedural fairness will entirely account for the relationship between participation and attitudes regarding the proposed change. This could be considered the "strong" hypothesis regarding the role of procedural justice; a "weak" hypothesis is that PJ only partially mediates the relationship between the two constructs.

H3: Subjective participation perceptions will mediate the relationship between objective participation and procedural justice.

As noted earlier, the experience of participation, i.e., going to a meeting or filling out a survey, may or may not be construed as "real" participation by the employee. If the act or behavior is viewed as psychologically meaningful versus shallow or symbolic, then positive perceptions of fairness are more likely to follow. Again, the strong hypothesis is that these perceptions entirely mediate the relationship, whereas a weaker hypothesis is that these perceptions only partially mediate the relationship.

H4: There are four distinct psychological processes comprising subjective participation.

This model explicates four separate factors representing subjective participation. This is consistent with literature to-date that focuses on subdividing and fine-tuning the nature of procedural justice. Konovsky (2000) notes, however,

that only a few studies compare alternative models of PJ. In one of these studies, Shapiro & Brett (1993) compared instrumental, non-instrumental and procedural enactment (similar to the knowledge pathway outlined above using a self-efficacy framework) models in a context of a grievance process. They found that each model accounted for some variance in PJ and outcomes and suggest that rather than one "best" model it may be more productive to integrate currently competitive models.

H5a: Tenure or length of service will impact attitudes of organizational change over and above participation; however, participation and procedural justice effects will still be evident over and above tenure.

H5b: Position in the hierarchy will impact perceptions of (subjective) status and influence over and above objective participation; however, participation effects will still be evident over and above hierarchy levels.

H5c: Overall satisfaction will impact attitudes of the organizational change over and above participation; however, participation and procedural justice effects will still be evident over and above satisfaction.

There are numerous ways the contextual variables might impact the model. That is, there is relatively limited theoretical justification for how these variables might play out in this model as few studies in this arena include these exogenous variables in their designs. Past experience in the workplace suggests that perceptions of procedural fairness will be less directly impacted by tenure and overall satisfaction, but that these issues set the stage for more general attitudes and orientations around proposed organizational changes. Hierarchy or objective status in the organization seems more likely to operate through subjective participation.

For example, if I am a manager, even if I don't directly participate in the planning process around an organizational change, I am still likely to feel a sense of influence and status as part of the decision-making "we," thereby positively influencing my perceptions of fairness. The above hypotheses should be viewed as starting points – alternative models may be implicated as the analysis progresses.

H6a: Overall satisfaction will be correlated with objective participation.

H6b: Overall satisfaction will be correlated with position in the hierarchy

Again, the literature is mute on these relationships, as overall satisfaction is typically viewed as an endpoint or outcome rather than a factor influencing subsequent perceptions. Experience suggests, however, that employees who are satisfied with the workplace are more likely to volunteer for participation opportunities; that is, satisfaction is linked with organizational citizenship or "above and beyond" role behaviors (Ashforth & Mael, 1989; Barker, 1998; Kramer, 1993, 1996; Shapiro & Schall, 1990). It is also often the case that those higher up in the organization appear to be more satisfied with their jobs or the workplace. Again, these are speculative hypotheses that serve as a starting point for analysis.

CHAPTER 2: METHODS

Study Context

In 1996, the Colorado State legislature mandated that all State employees be transitioned to a "pay-for-performance" or merit-based pay system. This system was to replace the traditional entitlement-based pay system that characterizes most public sector compensation plans. The new program, dubbed Colorado Peak Performance (CPP), was to be fully implemented statewide by 2001. Several departments volunteered to act as pilot groups in order to develop and test alternative measurement, evaluation and allocation aspects of the new system. The data used in this dissertation is from one of the departments (DPILOT) volunteering to serve this role.

Several task forces composed of department employees were convened along with a coordinating Design Team (DT). These groups were charged with the task of designing, implementing and monitoring the CPP program within the department. The goal was to offer a "bottom-up" design process by which front-line employees could provide input into the design process. As documented elsewhere (Sikora, 2000), management of the department, as well as the State-level administrative group, vetoed several key components of the plan as developed by the task forces/DT, and the "bottom-up" process finally gave way to a "top-down" plan authored by senior-level managers. The entire program has floundered as the reality of implementation has crashed headlong into the State bureaucracy and employee advocacy groups.

The data used for this paper is one component of a larger ethnographic, qualitative and quantitative program of research initiated at the onset of this department's planning process (December, 1997) continuing through 2000 when new departmental management effectively shut down the research process. The survey reflects opinion early in the timeline, before the vetoes and roadblocks became overt to employees in the department. At the time of fielding, several mechanisms were being put in place to offer information to employees (e.g., lunch meetings sponsored by the task forces) as well as requests to managers to hold discussions and meetings with their staff regarding implications of the new performance management process for their work group. In general, the environment was encouraging of participation, input and information-sharing, and enthusiasm was overtly high around the "biggest change to ever hit State government" (DT member quote in Sikora, 1999).

The above environment was a rich one for research into participation and procedural justice. Per Konovsy (2000), Tracey, et al. (1995) and Taylor & Pierce (1999), changes in compensation and performance measurement systems cause issues around fairness to be particularly salient. Participation is often a tool used to build support and reduce resistance to these new programs and it is likely, then, that the DPILOT context would lend itself well to research regarding the interplay between justice and involvement. In fact, feedback from focus groups held very early in the process was laden with comments and concerns regarding fairness. Many of these comments form the basis of the survey questions used as the source of this analysis. In effect, the issues around participation and justice were raised by the

employees spontaneously rather than as directed by an a priori research agenda. This research will hopefully contribute to the literature regarding participation and procedural justice, as well as illuminate some of the potential facilitators and inhibitors of success for performance management programs as they are viewed and described from an employee perspective.

Questionnaire Design

One of the challenges of field research is the interplay between textbook research design and the more pragmatic view taken by site clients or users. The questionnaire developed for this study was sponsored by the management of DPILOT. As such, it was designed to capture information to aid managers and team members in formulating CPP elements and training programs, as well as serve as a tracking vehicle to monitor change in employee knowledge and attitudes over the course of program development. Pragmatic issues, therefore, often took precedence over academic needs.

Although the questionnaire ultimately incorporated many questions germane to theory building and testing, management of the department had final say over what was included or excluded in the questionnaire. With few exceptions, all questions included had to provide some tangible value to the management group at DPILOT; therefore, the more generic attitude or organizational justice scales available in the literature gave way to more context-relevant questions that were, on the surface, more valuable to users of the data. Those few indicators based on a literature review were adapted for the immediate context, as findings were directly

adapted for program development and evaluation, as well as management training in the department.

In addition, because of the number of issues covered by the CPP task forces, the length of the questionnaire or, more specifically, respondent fatigue and compliance became an issue. In order to accommodate the range and depth of topics from the CPP work groups, questionnaire length eventually spanned nine pages (using 8-point fonts). In order to maintain employee engagement and data quality, scales were truncated from the original seven or nine points for many attitude questions to five and even three points in some cases. In effect, there was a trade-off of variance for survival of some question batteries, particularly the more theory-focused questions. Restriction of range, then, may be a limiting factor in some of the analyses.

Sample

In order to maximize respondent privacy, questionnaires were mailed to all employees' homes in November 1998. Supervisors were asked, however, to allow time during the workday for employees to fill out the questionnaire during working hours if they so desired. Of the 525 mailed, 361 were returned for a response rate of 69%. This response rate was quite high despite the length of the questionnaire and the fact that formal "fill out the questionnaire during staff meetings" techniques were not deployed. Also, review of missing data indicates that the vast majority of respondents (e.g., 98%) answered all questions. Because much of the language and issues raised in the questionnaire were derived directly from employee feedback

sessions, as well as the personal relevance of the CPP program, it appears that respondents were able to remain interested and engaged in the questionnaire, despite its length.

For purposes of this analysis, a sample size of 361 appears to be adequate. Per Garson (2001) and MacCallum and Austin (2000), most structural equation modeling (SEM) studies use samples in the 200-400 range and sample size becomes worrisome only when it drops below 100. This assessment should be tempered, however, with a look at the number of variables or parameters included in the proposed model. The more complex the model, the more sample is typically required for stable and interpretable results (Garson, 2001; Kline, 1998; Tanaka, Panter, Winborne, & Huba, 1990). On the other hand, too large a sample increases the probability of rejection of the null hypothesis that predicted and observed matrices are consistent with each other. In SEM, one wishes to accept the null hypothesis; i.e., accept the hypothesis that the proposed model is consistent with the data. An overly large sample increases the probability that minor discrepancies will be evaluated as significant differences, despite the fact that they are not substantively important. A sample of 361 would initially appear to balance needs of a complex model with statistical inference.

Examination of distributions by organizational level, work group, tenure, gender and ethnicity suggest that the sample is representative of the department. Half of the sample is composed of professional staff (accountants, computer programmers, planners, engineers, etc.), whereas the remainder of the sample is equally divided between clerical and managerial staff. The majority of respondents

were over 45 years old (56%), while less than 10% (7.2%) were under 35 years of age. Reflecting this older workforce, mean length of service in State government was about 12 years (11.9 years) and mean length of service in their division was just under 10 years (9.6 years). Slightly over half of the sample is female (54%). Three quarters of the sample report their ethnicity/racial identity as White-non-Hispanic, 7% report Hispanic and 5% as Black. Finally, a majority (61%) of respondents report having a college degree and a significant proportion of that group (38%) report having obtained a graduate degree. All respondents have at least a high school diploma.

Checks for Assumption Violations

Normality

While SEM is found to be robust enough to accommodate minor violations of normality (Garson, 2001; Tanaka, et al., 1990), checks and corrections for substantial skewness and kurtosis need to occur prior to any model specification. Examination of frequency plots, frequency distributions and data ranges indicated no substantial outlier problems for the indicators used in this study. Histograms and box plots suggested that several of the variables were potentially skewed; these variables were log transformed, whereas the negatively skewed were transformed to the 2^{nd} power in order to "bring in the tails" of their respective distributions. The transformed and original variables were then correlated with all other items to assess the degree to which the transformation impacted the association between variables.

Transformations did not appreciably impact bivariate correlations; therefore, original rather than transformed variables were used in the analysis.

Dichotomous and Ordinal-Level Data

Along with assumptions of normality, SEM also assumes interval-level or greater data. However, like other GLM applications, it is often used with ordinal, even dichotomous data. Studies (Tanaka, et al., 1990) have shown that it is primarily statistical inference that suffers under these conditions, not substantive interpretation of output. This assumes, however, that ordinal scales are five points or greater and that dichotomous indicators are used only for exogenous (variables that are not modeled as "effects" of any other latent variable) not endogenous variables. Several dichotomous indicators are used to form an exogenous variable (Objective Participation) and a single three-point categorical indicator is used to form another exogenous latent (Category). Given that these scale violations occur only in exogenous variables, we will assume that the substantive results of the analysis will be generally unaffected by these violations. Statistical significance may be impacted due to restricted variance, as might reliability and factor loadings for the Objective Participation latent.

Analysis Plan and Goals

This section provides an overview of the analysis phases used in this paper. Detailed analytical features within each phase will be described in the relevant Results section. The reader is also directed to Appendix A for a more general review of Structural Equation Modeling (SEM) concepts and techniques. More

thorough, yet accessible, introductions can be found in Garson, 2001; Kline, 1998; MacCallum & Austin, 2000; and Tanaka, et al., 1990.

Per recommendations of Kline (1998) and Anderson & Gerbing (1988), a two-step or "layered" (Gerbing, Hamilton, & Freeman, 1994) approach was used for analysis: measurement properties of the model (the measurement model) were assessed prior to evaluation of the structural relationships among measures (the structural model). Further, following the procedure outlined by Judd & McClelland (1998), the development of the measurement model was accomplished in two stages. First, the unidimensionality and reliability of individual latent constructs were determined via principal components analysis, then the entire system of measures assessed for convergent and divergent validity via confirmatory factor analysis. Hypothesis Four regarding the multi-factor nature of "subjective participation" was tested in this phase: is there evidence to support that four distinct factors exist that serve as mediators between objective participation and perceptions of procedural justice?

The primary role of the structural model is to test hypotheses regarding mediation and significance of control factor parameter estimates. Garson (2001) suggests that evaluation of relative importance of and relationships between constructs hinges on a correctly specified model; i.e., it is presumptive to evaluate the hypotheses regarding mediation or parameter significance if the proposed model does not adequately fit the data. The first step in the structural modeling phase, then, was the establishment of a parsimonious model with adequate fit to the data. This was accomplished via the nested model approach suggested by Anderson and

Gerbing (1988). Once an adequate structural model was obtained, i.e., a meaningful and parsimonious model with adequate fit, tests regarding mediation and relationships among latents were conducted.

A "suite" of goodness of fit indices (Kline, 1998) was used to evaluate measurement and structural models, as different indicators provide different insights as to the fit of the model (see Appendix A for overview of various fit measures). Chi^2 is sensitive to sample size and is used primarily as the basis for nested model comparisons (see below). GFI is less sensitive to sample size and is sometimes interpreted as an R^2 or proportion of observed covariation explained by the modeled covariances (Kline, 1998). The AGFI penalizes for model complexity, thereby providing a more conservative estimate of fit. Three "relative" fit indices are used as well: the NFI, which compares the fit of the proposed model with a null or independence model; the TLI, which corrects for model complexity; and CFI, which is less sensitive to sample size. Finally, RMSEA is used as an index of model error, i.e., unlike the GFI, AGFI, NFI, TLI and CFI, lower numbers in the range of .05 indicate better fit. RMSEA has an additional advantage of providing a confidence interval for evaluating the hypothesis that the model fits the observed matrix.

As recommended by several SEM authors (Anderson & Gerbing, 1988; Garson, 2001; Kline, 1998; MacCallum & Austin, 2000; MacCallum, Rosnowski, & Necowitz, 1992; Tanaka, Panter, Winborne, & Huba, 1990), evaluation of the adequacy of a measurement or structural model was not conducted in isolation but via comparison among alternative models. While certain thresholds can indicate acceptable or poor fit, it is important to compare the proposed model with plausible

alternatives. In some cases, the comparison is implicit (i.e., use of incremental or "relative" goodness-of-fit indicators such as the NFI, TLI or CFI), but in most cases a proposed model was explicitly evaluated against a hierarchical rival model. In these cases, a sequential Chi^2 difference test (Anderson & Gerbing, 1988; Bentler & Bonett, 1980; Kline, 1998) was used to test the hypothesis that one model was significantly different than another. While there is not consensus as to how to compare other fit indicators across models (i.e., NFI, CFI), Widaman (1998) suggests that differences of less than .01 should not be considered meaningful.

In addition to significance tests, criteria of parsimony and meaningfulness were used to evaluate rival models with the preferred model displaying not only better or equivalent fit, but also evidencing improved interpretability and simplicity. Model respecification could continue to the point of a fully saturated model (i.e., all possible covariances accounted for) with a perfect fit, but as noted by MacCallum et al. (1992), empirically-driven respecification increases the risk of capitalization on chance. MacCallum and associates suggest that only respecifications resulting in substantial and theoretically substantive improvements be pursued. The final measurement and structural models were derived with the overarching goal of balance across fit, parsimony and meaningfulness criteria, not simply "best" fit.

Review of results will reflect the above sequence of analysis steps. First, individual latent measures will be described along with their respective principal components findings. The results of the confirmatory phase, i.e., validation of the entire system of latents, will then be summarized. The derivation of the structural model(s) will then be reviewed, followed by tests of mediation and control effects.

The analysis for all CFA and SEM models is performed using AMOS, version 4 (Arbuckle & Wothke, 1999) and covariance matrices, rather than correlation matrices. The covariance matrix submitted for analysis may be found in Appendix B. A section summarizing findings per hypothesis closes the Results portion of this dissertation.

CHAPTER 3: RESULTS

Descriptives and Correlations

Nine latent factors were developed for this analysis; indicator specification per latent variable is summarized below in the "Measures and Principal Components" section. Means, standard deviations, bivariate correlations, and principal component findings of indicators, organized by factor, can be found in Table 2. Findings for the Subjective Participation factors, however, are treated separately (Tables 3 and 4), as more detail is required for evaluation of Hypothesis Four. Note that, in general, attitudes and expected behaviors regarding CPP received, at best, neutral ratings (many hover around the mid-point of their five point scales). It was, in fact, these relatively low ratings within a context of numerous participation "opportunities" that stimulated this investigation into "why aren't we seeing more positive expectations within our 'new' culture of involvement?"

Table 2: Measures Summary

Q#	Question	Type	N	M	s.d.	Zero-order				PCA Load-ings
CONTROL VARIABLES										
Category										
Q32	What category describes your job category ?	3 pt	345	1.99	0.68	na				na
Overall Satisfaction						**1a**	**1b**	**1d**		**α = .82**
Q1a	In general, I like working in my division.	3 pt *	360	1.45	0.56	1.00				.90
Q1b	In general, I would say that I am ..... with my job.	3 pt *	359	1.62	0.58	.68	1.00			.84
Q1d	Would you recommend working in your division?	3 pt *	358	1.78	0.76	.64	.51	1.00		.83
PCA Eigenvalue / % var explained										2.22/ 74%
Tenure						**27**	**29**	**33**		**α = .86**
Q27	How long have you worked in State government?	Cont	318	11.90	7.52	1.00				.92
Q29	How many years have you worked in your division?	Cont	297	9.60	9.55	.80	1.00			.90
Q33	What is your current step level?	7 pt	307	5.45	2.05	.60	.58	1.00		.82
PCA Eigenvalue / % var explained										2.34/ 78%
OBJECTIVE PARTICIPATION						**13**	**14**	**31**		**α = .66**
Q13	I have been keeping track of CPP in DORA.	Y/N *	356	1.48	0.50	1.00				.70
Q14	I had an opportunity to provide input.	Y/N *	356	1.52	0.50	.21	1.00			.69
Q31	In a DORA CPP Task Force or Design Team?	Y/N *	345	1.87	0.33	.27	.27	1.00		.74
PCA Eigenvalue / % var explained										1.51/ 50%

*R=low numbers are more positive, e.g., Yes = 1, No = 2 or "very much"= 1, "somewhat"=2, and "not at all" = 3

ENDOGENOUS VARS (Exc. SUBJECTIVE PARTICIPATION)

Q#	Question	Type	N	M	s.d.	Zero-order				PCA Load-ings
Perceptions of Procedure Justice Around CPP						**22p**	**22q**	**22f**	**22r**	**α = .80**
Q22p	CPP pay increases will be based more on favoritism than performance. (rc)	5 pt	352	2.48	1.28	1.00				.84
Q22q	I believe I will be able to have the right kind of input into my goals and objectives.	5 pt	352	3.08	1.15	.42	1.00			.74
Q22f	I do not expect merit awards to be distributed fairly. (rc)	5 pt	358	2.83	1.25	.66	.42	1.00		.78
Q22r	If I work hard I am confi-dent that I will get a Peak Performer award. (rc)	5 pt	354	2.51	1.24	.53	.53	.42	1.00	.80
PCA Eigenvalue / % var explained										2.50/ 62%
Attitudes About CPP						**22d**	**22k**	**22m**		**α = .68**
Q22d	I agree with the objectives behind merit-based pay (CPP).	5 pt	355	3.17	1.37	1.00				.86
Q22k	In general, I support having my pay based on how well I perform.	5 pt	354	3.86	1.12	.52	1.00			.76
Q22m	Merit pay plans like CPP won't work in the public sector. (rc)	5 pt	352	2.91	1.40	.45	.26	1.00		.70
PCA Eigenvalue / % var explained										1.82/ 61%
Behavioral Expectations						**23e**	**23f**	**23i**		**α = .81**
Q23e	Not encourage me to offer more help to my coworkers (rc)	5 pt	356	2.93	1.32	1.00				.86
Q23f	Not encourage me to improve the quality of my work (rc)	5 pt	355	3.00	1.34	.64	1.00			.87
Q23i	Not encourage me to go "above and beyond" my job description	5 pt	349	2.93	1.32	.54	.57	1.00		.82
PCA Eigenvalue / % var explained										2.17/ 72%

* (rc) = reverse coded so that high scores all reflect more positive responses

Measurement Model

Measures and Principal Components Analysis Results

With the exception of the Subjective Participation latents, measures are described in order of their appearance in the hypothesized model (Fig. 1, Introduction). That is, exogenous control variables Category, Tenure and Satisfaction are discussed first, followed by the exogenous "causal chain" factor,

Objective Participation. Measures used to form the endogenous variables of Perceptions of Procedural Justice, Attitudes toward CPP, and CPP Behaviors will then be detailed. The endogenous factor Subjective Participation will be treated later, as this involves not only a description of measures and reliability, but a test of the hypothesis that the construct is, indeed, composed of four distinct latent factors: Knowledge, Influence, Voice and Status.

Material in parentheses refers to the abbreviation used for the factor in subsequent measurement and structural modeling. Again, please refer to Table 2 for details regarding the following measures; detailed descriptive, zero-order, and PCA results for the Subjective Participation latents are found later in Tables 3 and 4.

Category (Categ)

This single indicator latent asks the participant to report "What category best describes your job category or function: administrative (clerical), professional staff and supervisor level? These are the categories used by Human Resources, as well as by employees, to describe major groups in the organization. The term "Category" is used here instead of Hierarchical level (used in the Introduction), to distinguish it from the latent variable of "Status." In preliminary discussions around the proposed model, the two constructs were often confused as having similar meaning. The principal components phase of analysis is not relevant to a single indicator factor; further discussion of this measure will appear in the confirmatory factor analysis section.

Tenure (Tenure)

This measure reflects how long the individual has been employed within the State system. The first two indicators: "How long have you worked in State government?" and "How many years have you worked in your division?" capture length of general service to the State as well as duration of service in the current division (subgroup of the department). Another indicator, "What is your current step level?" is a more indirect measure of tenure, as this is the "old" set of payroll categories used to determine pay increases on an annual basis that will be phased out with the implementation of CPP. New employees start at "step 1" and by the time they accumulate 10 years of service, they usually arrive at "step 7." Each of the steps has a unique pay structure and, contrary to the CPP program, employees reach new steps based on length of service only, not performance on the job. The first two indicators used continuous scales (number of years), whereas the step indicator was based on a seven-point scale corresponding to the seven payroll steps. Reliability of this scale is .86 and eigenvalue of first principal component is 2.34 with 78% variance explained. Unrotated loadings of all indicators on the first principal component exceed .80.

Satisfaction (Satisf)

Several questions addressed issues of overall satisfaction with job tasks and work environment. Some were focused at a general "State" level, while others were focused at the more proximal division level. In focus groups (Sikora, 1999), it was found that the division was the most relevant and salient work unit for the employee; i.e., the concept of "State government" provided a minimal level of identity as a

"public sector" worker, but it was the immediacy of the division dynamics that seemed to primarily impact worker perceptions and evaluations of their work life. Three indicators comprise this measure: a) In general, I like working in my division: (1 = very much, 2 = somewhat, 3 = not at all); b) In general I would say that I am ..... with my job. (1 = very satisfied, 2 = somewhat satisfied, 3 = not at all satisfied); and c) Would you recommend working in your division to others? (1 =Yes, definitely 2 = Maybe, 3 = No, definitely not). Reliability of this scale is .82 and eigenvalue of first principal component is 2.22 with 78% variance explained. Unrotated loadings of all indicators on the first principal component exceed .80.

Objective Participation (Obj Part)

The line between objective participation and subjective participation is the line between observable behavior and less observable perceptions, judgments or evaluations about those behaviors. Objective participation in the CPP context includes a variety of "opportunities" to participate and whether the employee did or did not take advantage of these opportunities. It is important to note that these "opportunities" were largely defined and orchestrated by the CPP steering committee, top Human Resource staff, and/or management staff in the division. Employees may have attended a meeting, filled out a questionnaire, or written down comments after a training session, but still not feel that they had an authentic opportunity to participate (as captured in Subjective Participation below). As one employee commented during an informal hallway chat after a CPP lunch meeting: "Yeah, they love input as long as you tell them what they want to hear."

The questionnaire included several "Yes/No" items that the Design Team wanted to use to assess the degree to which employees were "taking advantage" of opportunities to be involved in the planning process. Several items were designed specifically to assess if the supervisors/managers in the work groups were beginning to have discussions with their staff about CPP implications. These items were less about the employee level of participation and more about supervisor activity; therefore, these types of questions were not included in the Objective Participation latent. Three items were identified that appear to capture a range of employee participation behavior around the pending change (all Yes/No items with Yes = 1, No = 2):

a) I having been keeping track of CPP in our department – this suggests a minimal of overt engagement in the issues around the pending change;

b) I had an opportunity to provide input regarding CPP – this suggests that at least one vehicle for participatory behavior was accessed, i.e., the individual participated in a meeting, Brown Bag or feedback session regarding CPP; and

c) Were you a member of a CPP Task Force or Design Team? – this is the highest level of overt participation available in the department.

Because these items all used two-point scales, variance is restricted and associated correlations and factor results appear to be truncated compared to other latents. However, despite this restricted range, reliability of this scale is .68 with the eigenvalue of the first principal component 1.51 representing 50% variance

explained. Unrotated loadings of all indicators on the first principal component were at least .69. Again, the "opportunity" to participate or attendance at Task Force meetings does not necessarily equate to subjective perceptions of authentic participation. While it is the hope and assumption by management that this is the case, a central issue in this study is whether this overt behavior is synonymous with subjective experience.

Procedural Justice of CPP (PJ)

This factor measures the perceived fairness of processes associated with the proposed CPP plan. Because CPP had not yet been implemented and was, in fact, not to be fully deployed for at least two more years, these perceptions reflect anticipated justice or fairness of the program: fundamentally, will the system work the way it is supposed to? The items here are quite specific to the CPP program; for example, one of the items, "I will be able to have the right kind of input into my goals and objectives," reflects a core element of the new performance management process: subordinate involvement in goal-setting. Much of the training and promotion of the new plan emphasized new "rules of the game" in contrast to the processes used traditionally in the public sector, e.g., employee effort will be more directly linked to compensation results. A key process element was what many employees viewed as new "objectivity" of reward allocations versus the current system, which was viewed as too subjective with supervisors able to "play favorites" (Sikora, 1998). This measure, then, reflects how fair or just employees anticipate the new processes will be as CPP is deployed in the department.

Four items were used to reflect this latent construct: a) CPP pay increases will be based more on favoritism than performance (rc); b) I believe I will be able to have the right kind of input into my goals and objectives; c) I do not expect merit awards to be distributed fairly (rc); and, d) If I work hard I am confident that I will get a Peak Performer award (rc). All indicators use a five-point agree-disagree scale anchored at the endpoints as 5 = strongly agree, 1 = strongly disagree. Some items were negatively worded to avoid response set bias, but have been reverse coded so that higher ratings reflect more positive response. Reliability of this scale is .80 and eigenvalue of first principal component is 2.50 with 52% variance explained. Unrotated loadings of indicators on the first principal component range from .74 (I will have the right kind of input into my goals and objectives) to .84 (pay increases will be based more on favoritism than performance).

Attitudes Toward CPP (ATT)

This measure reflects the degree to which employees embrace (or do not) the core concept of CPP: merit-based pay. While other elements of CPP also reflect a shift from the "old" to the "new" (e.g., goal setting, supervisor coaching), it is the shift away from tenure-based pay to performance-based that was clearly the most salient and important feature of the proposed system for most employees (Sikora, 1998). Senior management was concerned that without positive attitudes toward this key concept, desired behaviors and outcomes (e.g., increased productivity) would not occur.

Three indicators are used for this construct, all using a five-point agree-disagree scale anchored at the endpoints as 5 = strongly agree, 1 = strongly disagree.

Some items were negatively worded to avoid response set bias, but have been reverse coded so that higher ratings reflect more positive response. The three indicators are: a) I agree with the objectives behind merit-based pay (CPP); b) In general, I support having my pay based on how well I perform; and c) Merit pay plans like CPP won't work in the public sector (rc). Reliability of this scale is slightly lower than other measures at .68; however, examination of principal component results, factor loadings, and item content supports the use of this latent as a unidimensional construct. Eigenvalue of first principal component is 1.82 with 61% variance explained (no evidence of a second factor) and unrotated loadings of indicators on the first principal component are all at or above .70.

Anticipated Behaviors Around CPP (BEH)

As noted earlier, the driving force behind CPP, as articulated by its founding architects (Sikora, 1998), is the desire to transform employee behavior from mediocre, "within the boundaries" output to more proactive, "above and beyond" performance. The Representative introducing the bill to the legislature was concerned that State employees were not working to full potential and that the tenure-based pay system was largely to blame. The hope for CPP was a transformed culture where employees would move beyond the boundaries of their formal job description and enlarge the scope of their work. Again, since full deployment of CPP was at least two years away, there were no objective behavior measures to use as outcome measures of the CPP planning process. Management did want to ascertain the degree to which employees anticipated engaging in desired behaviors,

however, with the assumption that willingness to assume these "new" behaviors was prerequisite to them actually occurring.

Several questionnaire items addressed group level behaviors (i.e., work group productivity will increase); however, since the proposed model focused on processes at an individual level, these group level indicators were deemed inappropriate for this study. Three items were specific to the new individual-level behaviors desired by CPP authors: a) CPP will not encourage me to offer more help to my coworkers (rc); b) not encourage me to improve the quality of my work (rc); and, c) not encourage me to go "above and beyond" my job description. All indicators use a five-point agree-disagree scale anchored at the endpoints as 5 = strongly agree, 1 = strongly disagree. Some items were negatively worded to avoid response set bias. but have been reverse coded so that higher ratings reflect more positive response. Reliability of this scale is .81 and eigenvalue of first principal component is 2.17 with 72% variance explained. Unrotated loadings of indicators on the first principal component all exceed .80.

Subjective Participation

An overarching question for this study is if the unique pathways implied by theory are evident empirically; e.g., Hypothesis Four states that there are four latent variables uniquely mediating relationships in the model. While the literature seems to support at least four psychological pathways between participation and perceptions of fairness, these four pathways have not yet been empirically confirmed. Rather than focus on the measurement properties of each latent variable,

then, it seemed appropriate to first ask if there are indeed four unique factors, then focus on the properties of the individual measures.

Indicators and Descriptive Data

This construct was originally conceptualized as four distinct latent factors as described in Table 3 below. With the exception of one "Knowledge" indicator, which used a four point "excellent, good, fair, poor" scale, all items used a five-point agree-disagree scale anchored at the endpoints as 5 = strongly agree, 1 = strongly disagree. Some items were negatively worded to avoid response set bias, but have been reverse coded so that higher ratings reflect more positive response. Means and standard deviations of these items as well as their operating definitions can be found in Table 3.

Table 3: Subjective Participation, Operating Definitions and Descriptive Data

		M	s.d
Influence:	perception that one has or can have impact on decisions or outcomes		
Q2e	It really isn't possible to change things around here. (rc)	2.92	1.21
Q2f	Employees don't have much opportunity to influence what goes on.(rc)	2.83	1.25
Q2s	I am encouraged to challenge the way things have been done in the past.	2.85	1.19
Knowledge:	awareness or understanding of facts or implications of decisions		
Q10	Would you rate your knowledge of CPP as: *(4 pt)*	2.19	0.79
Q22a	I have a good understanding of WHY CPP is happening.	3.37	1.32
Q22b	I have a good understanding of HOW CPP will work.	2.66	1.15
Q22c	I have a good understanding of WHAT CPP is.	3.12	1.16
Status:	perception of inclusion, value or worth as member of organizational "ingroup"		
Q2g	There is a big gap between supervisors and the rest of the division. (rc)	2.79	1.25
Q2j	Management in my division tells us the truth.	3.18	1.33
Q2n	Management in my division believes employees are important.	3.30	1.26
Voice:	perception of freedom to express true opinion without reprisal		
Q2d	Employees are not encouraged to openly share ideas. (rc)	3.43	1.24
Q2k	Employees are afraid to voice opinion mgnt doesn't want to hear. (rc)	2.87	1.32
Q2u	You really have to watch what you say around here. (rc)	2.67	1.28

A review of the zero-order correlations (Table 4) among these indicators suggests that a four factor model may not fit the data.

Table 4: Subjective Participation Zero-Order Correlations

	2e	2f	2s	10	22a	22b	22c	2g	2j	2n	2d	2k	2u
Q2e Isn't possible to change things (rc).	1												
Q2f Don't have opportunity to influence.(rc)	.79	1											
Q2s Encouraged to challenge.	.50	.50	1										
Q10 Knowledge of CPP.	.13	.11	.13	1									
Q22a Understand WHY CPP happening.	.16	.10	.17	.36	1								
Q22b Understand HOW CPP will work.	.15	.11	.09	.55	.47	1							
Q22c Understand WHAT CPP is.	.18	.14	.08	.55	.60	.74	1						
Q2g Gap between supervisors and division. (rc)	.51	.65	.48	.05	.09	.04	.09	1					
Q2j Management tells the truth.	.44	.54	.43	.06	.08	.01	.09	.48	1				
Q2n Employees are important.	.55	.67	.47	.05	.11	.09	.13	.60	.48	1			
Q2d Not encouraged to share ideas. (rc)	.63	.68	.45	.07	.07	.14	.12	.54	.48	.56	1		
Q2k Afraid to voice an opinion. (rc)	.50	.66	.40	.04	.09	.09	.12	.59	.47	.59	.58	1	
Q2u Have to watch what you say. (rc)	.48	.56	.36	.09	.10	.14	.15	.51	.46	.53	.48	.58	1

That is, while the within latent correlations along the diagonal are generally quite high and consistent with what one might expect for homogeneous factors, there are patterns of equally high correlations between items. This is especially evident across clusters of items representing influence, voice and status. For example, while correlations within the Influence cluster range between .50 and .79, indicating coherence among the items, correlations between these items and the Status items range between .43 and .67, suggesting substantial overlap between the two constructs. Similarly, there are patterns of intercorrelation between Influence and Voice as well as Status and Voice. Of the four proposed latent variables, only the items assigned to Knowledge initially appear to be homogenous and distinct; i.e., these items are highly intercorrelated, yet not highly correlated with other items from other factors.

Principal Components

Following the procedure described by Judd & McClelland (1998), principal components analysis (PCA) was conducted in which all 12 items were submitted simultaneously to determine if there was any evidence of four unique factors. As seen in Table 5, there is evidence of only two factors: one that includes all Influence, Voice and Status items (eigenvalue = 8.48, 44% variance explained) and a second containing the Knowledge items (eigenvalue = 2.27, 18% variance explained). There is no indication of a third or fourth factor in this initial PCA step. As a result, based on this initial PCA, as well as patterns in the zero-order correlation table above, *we reject Hypothesis Four* and reconceptualize the model as having only two factors or latent constructs, one being Knowledge and the other reflecting aspects of Influence, Voice and Status.

Table 5: Subjective Participation PCA

		PCA 1	PCA 2	
Factor 1 *(eigenvalue/%var)*		*8.68/44%*	*3.52/70%*	a = .89
Q2e	Isn't possible to change things (rc).	0.7839	0.8398	
Q2f	Don't have opportunity to influence.(rc)	0.8744	0.9148	
Q2s	Encouraged to challenge.	0.6388	------	
Q2g	Gap between supervisors and division. (rc)	0.7644	------	
Q2j	Management tells the truth.	0.7246	------	
Q2n	Employees are important.	0.9335	0.8097	
Q2d	Not encouraged to share ideas. (rc)	0.7737	0.8256	
Q2k	Afraid to voice an opinion. (rc)	0.7799	0.7936	
Q2u	Have to watch what you say. (rc)	0.7145	------	
Factor 2 *(PCA 1 eigenvalue/%var)*		*2.27/18%*	*2.65/66%*	a = .83
Q10	Knowledge of CPP.	0.6504	0.7463	
Q22a	Understand WHY CPP happening.	0.7902	0.7360	
Q22b	Understand HOW CPP will work.	0.8168	0.8600	
Q22c	Understand WHAT CPP is.	0.8671	0.9039	

PCA 1 = all items entered, unrotated factor loadings
PCA 2 = separate analyses, unrotated loadings

Principal components analysis was again utilized in order to fine-tune these two remaining measures. Specifically, when examining factor loadings on the first principal component, the largest two loadings are associated with a Status item, "employees are important" (.9335) and an Influence item, "don't have opportunity to influence" (.8744). Two of the three next highest loadings (about .77 each) are associated with Voice items: "not encouraged to share ideas" and "afraid to voice an opinion." It appears, then, that this first factor is truly a blend of the three initially proposed constructs. It is difficult to assign a new label to this latent factor, as it is not "just" an Influence, Voice or a Status factor, but, apparently, a blend of the three concepts.

It is not within the scope of this paper to fully explicate or empirically develop this new construct. Factor labels tend to take on an overly important "life of their own" (e.g., the "nominalistic" and naming fallacies noted by Anderson &

Gerbing, 1988 and Kline, 1998) and it may be presumptive to rename this latent without a return to the literature. For purposes of this study and pragmatic needs of subsequent modeling, however, this factor will continue to be referred to as "Subjective Participation," as it does appear to capture several key facets of how employees perceive or feel about the psychological authenticity of their involvement in the organization. Because this construct will play a significant role in mediating between participation and perceptions of fairness (as noted later), future research should be directed at more fully developing and understanding the nature and etiology of employees' subjective interpretations of participation experiences. Further examination of the possible nature of this new construct can be found in the Discussion section.

In order to create a more parsimonious model and not tax the sample with redundant indicators, the first principal component or "Subjective Participation" factor was redefined to include only five of the original nine items. Items with the largest loadings were chosen to represent the new latent: the four noted in the above paragraph plus the item "it isn't possible to change things around here" (loading = .7839). These five items were submitted to a second principal components analysis, as were the original four Knowledge items (separate PCA for each of the two latents). Results of this second PCA can be found in the far right column of Table 5. Reliability of the new Subjective Participation (Subj Part) scale is .89 with eigenvalue = 3.52 explaining 70% of variance; all items continue to load at or above .79, with "opportunity to influence" now showing the highest loading at .91. Reliability of the Knowledge (Knowl) scale is .83, eigenvalue = 2.65 explaining

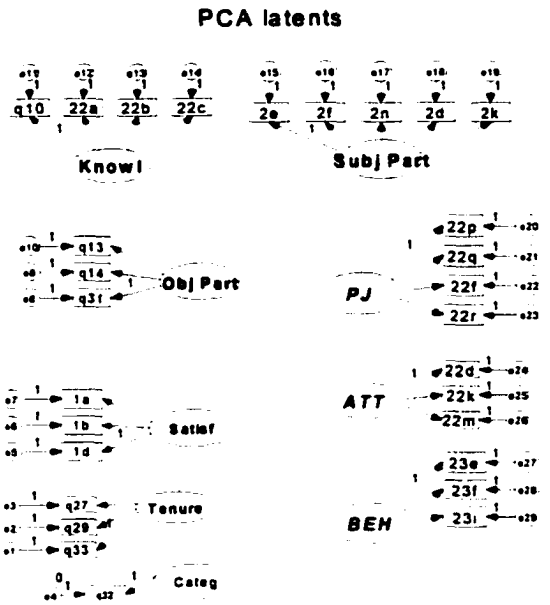
66% of variance; all items load at or above .75 with "I understand what CPP is" reflecting the highest loading at .90.

For purposes of subsequent analyses, then, we will include only two rather than the four latents originally proposed in the conceptual model. The five indicator latent of "Subjective Participation" (Subj Part), which appears to reflect aspects of Voice, Influence and Status along with the four indicator measure of "Knowledge" (Knowl), will function as independent latents that may or may not mediate relationships between Objective Participation and other endogenous variables. Before these relationships are modeled, however, the entire system of latent variables, as derived from the PCA, will be examined to establish convergent and divergent validity of the complete measurement model.

Confirmatory Factor Analysis Summary

Figure 2 displays the initial set of latent variables as derived from the PCA analysis (see Tables 2 and 3 for relationship of questionnaire item numbers and wording).

Figure 2: Null Measurement Model



Following convention (Kline, 1998), scaling of each latent is accomplished by fixing one indicator loading to 1.00; similarly, measurement errors are scaled by fixing their residual path coefficient to 1.00. Because latent variables are hypothetical, they are not inherently scaled and the practice of constraining one indicator allows us to scale and ascribe meaning to the latent variable. There is one single indicator latent (Categ), and because it is assumed that a single item latent is measured without error (Garson, 2001; Kline, 1998), error variance is set to zero as well as path coefficients fixed at 1.00 (to scale latent and error as for other latents).

This independence or null model specifies no relationships among latents, but more importantly, explicitly reflects a hypothesis of unidimensional measurement (Kline, 1998). That is, each indicator is specified to load on one and only one latent; similarly, no measurement errors are specified to covary with other errors. For purposes of evaluating convergent and divergent validity, as well as

maintaining homogeneity and interpretability of the latent constructs, it is often preferable to not allow cross-loadings between latents, but rather drop indicators that appear to be ambiguous (Anderson & Gerbing, 1988; Kline, 1998). This paper adopts this approach and will avoid multi-factor loading.

A modeled covariance among error terms suggests that there is something in common among indicators that is not specified in the model, i.e., systematic measurement error, unarticulated constructs, or some other source of shared variance. This type of multidimensionality is more defensible when covariation is specified within rather than between latents, i.e., within rather than between factor correlated measurement error. A potential problem with allowing covariation among error terms, however, is that it can be driven primarily by the goal of adding complexity to the model (i.e., improving goodness-of-fit) rather than for theoretically defensible reasons. In general, specification in this paper will avoid within factor correlated measurement error unless there appears to be a logical or theoretical justification to do so.

Model Comparison

Along with articulating the initial set of measurement hypotheses, this "null" model can serve as a basis of comparison for measurement and subsequent structural models; i.e., this is one of several nested models that could be compared in an "alternative models" analysis strategy. Conceptually, this parsimonious model hypothesizes that there are no relationships among the proposed latents. This is not necessarily a meaningful hypothesis on theoretical or practical grounds, but this model does provide a viable "least complex" endpoint for comparison of models

with additional freed parameters; i.e., do the proposed relationships improve fit or better replicate the observed covariance matrix?

Goodness-of-fit indicators for the null model are, as expected, quite poor (see Table 6 below), with all indices well below the thresholds recommended for even "adequate" or "fair" fit; e.g., $Chi^2/df > 3$; RMSEA > .05: other indicators below .80. Clearly, a model that specifies no relationship between latents is inconsistent with the data; this suggests that some amount of covariation among the latents will better represent the patterns in the observed matrix. Subsequent modeling steps will be targeted toward ascertaining if hypothesized relationships are viable.

Table 6: Summary of Fit Measures for Alternative Measurement Models

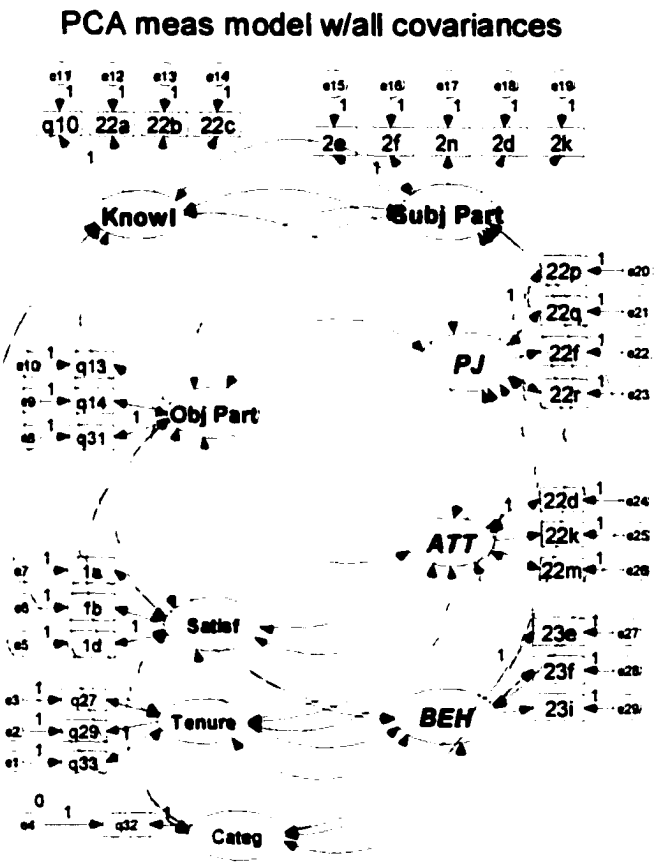
	CMIN	DF	P	PAR	C/DF	GFI	AGFI	NFI	TLI	CFI	RMSEA	LO	HI
Null (no covary)	1468.2	378	0.00	57	3.88	.77	.73	.71	.75	.77	.090	.085	.094
Meas Model 1	764.2	342	0.00	93	2.23	.87	.84	.85	.89	.91	.059	.053	.064
diff Null and M1	704.1	36	0.00		1.65	.11	.11	.14	.14	.14	.031	.032	.030
Meas Model 2 - Final	475.1	262	0.00	89	1.81	.91	.88	.89	.93	.94	.048	.041	.054
diff M1 and M2	289.1	80	0.00		0.42	.04	.04	.04	.04	.03	.011	.012	.010

* figures may not tie-out due to rounding

The other comparison extreme will be served by the measurement model in which every latent is hypothesized to covary with every other latent in the model. As diagrammed in the model below (Figure 3), all latents are allowed to freely covary; however, no cross-loadings or error covariances are specified. Overall fit for this measurement model appears to be adequate (row labeled "Meas Model 1" in Table 6 above). Several fit indicators are approaching or exceeding the recommended thresholds (e.g., $Chi^2/df < 3.00$; RMSEA approaching .05, but note that .05 is not within the confidence interval as specified by RMSEAHI and LO; CFI >.90) and fit is clearly improved over the null model with a Chi^2 difference of 704

being highly significant with 36 degrees of freedom. Given that the initial model containing all the latents and indicators from the PCA analysis appears to be at least adequate, it is worth examining it for evidence of convergent and divergent validity.

Figure 3: Measurement Model 1



Standardized Loadings

			Est
q10	<--	Knowl	0.64
22a	<--	Knowl	0.63
22b	<--	Knowl	0.82
q31	<--	Obj Part	0.47
q14	<--	Obj Part	0.50
q13	<--	Obj Part	0.54
1d	<--	Satisf	0.76
1b	<--	Satisf	0.74
1a	<--	Satisf	0.86
q33	<--	Tenure	0.61
2e	<--	Subj Part	0.82
2f	<--	Subj Part	0.92
2n	<--	Subj Part	0.74
2d	<--	Subj Part	0.75
2k	<--	Subj Part	0.71
22p	<--	PJ	0.81
22q	<--	PJ	0.64
22f	<--	PJ	0.71
22c	<--	Knowl	0.90
q29	<--	Tenure	0.89
q27	<--	Tenure	0.89
22d	<--	ATT	0.78
22k	<--	ATT	0.59
22r	<--	PJ	0.68
22m	<--	ATT	0.59
23e	<--	BEH	0.77
23f	<--	BEH	0.83
23i	<--	BEH	0.69

Convergent and Divergent Validity

Despite the overall adequacy of this initial measurement model, there are details suggesting changes that will incrementally improve fit and, more importantly, enhance interpretability of the measures. Again, the analysis goal is to ultimately balance fit, parsimony and meaning; simply relying on "good fit," as a criterion for evaluating the measurement model does not fully address this overarching goal.

Consistent with the PCA results, all factor loadings (Figure 3 above) are statistically significant (>.001) and many of the standardized loadings are at or above .70 indicating that at least half or more of the variance of the indicator can be explained by its relationship with the latent construct. In general, then, one can conclude that the hypothesized measurement model reflects substantial convergent validity.

Possible exceptions to this conclusion might be evidenced by the loadings on Obj Part (Objective Participation) and ATT (Attitudes); in both cases there are a few standardized, albeit statistically significant, loadings near or below .50. Recall that the indicators assigned to Obj Part are all based on yes/no scales; the restricted variance of these scales is likely contributing to the lower loadings (as well as lower reliability, as noted in the PCA analysis). Loadings on the ATT indicators in this "system model" are a bit lower than in the PCA analysis. However, a review of item content and PCA findings suggests that, while the standardized loadings may be somewhat less robust as compared to other indicators, retention of the ATT latent and its associated indicators is supported on logical or "meaning-based" grounds; i.e., some statistical criteria are approaching "borderline," but the criterion of meaningfulness seems to balance the evaluation.

Divergent validity is established by examination of the parameter estimates among latents: as the correlations among latents approaches unity, one begins to question the discriminability of individual latents (Kline, 1998; Judd & McClelland, 1998). Kline suggests a threshold of .85 as an indicator of excessive overlap between latents. As noted in Table 7, the vast majority of correlation coefficients are

below .50 with several covariances not crossing the .05 significance threshold. In general, correlations are higher where we ultimately expect to have direct or indirect effects; e.g., correlation between Subj Part and PJ is .69. One can conclude, then, that the measurement model exhibits the desired divergent as well as convergent validity and, as further discussed in the sections regarding the structural model, there is preliminary evidence that several of the hypothesized relationships will be supported.

Table 7: Measurement Model 1: Parameter Estimates

Parameter Estimates - Meas Model 1

	Stand	Unstand	S.E.	C.R.	P
Knowl <--> Obj Part	-0.80	-0.06	0.01	-6.06	0.00
Knowl <--> Satisf	-0.19	-0.05	0.018	-2.93	0.00
Knowl <--> Subj Part	0.18	0.09	0.03	3.02	0.00
Knowl <--> PJ	0.32	0.17	0.036	4.67	0.00
Knowl <--> ATT	0.36	0.20	0.04	4.90	0.00
Knowl <--> BEH	0.09	0.05	0.032	1.48	0.14
Obj Part <--> Satisf	0.20	0.02	0.008	2.41	0.02
Obj Part <--> Tenure	-0.09	-0.02	0.016	-1.15	0.25
Obj Part <--> Subj Part	-0.34	-0.05	0.014	-3.90	0.00
Obj Part <--> PJ	-0.38	-0.06	0.015	-4.02	0.00
Obj Part <--> ATT	-0.36	-0.06	0.016	-3.69	0.00
Obj Part <--> BEH	-0.12	-0.02	0.013	-1.48	0.14
Satisf <--> Tenure	0.06	0.04	0.044	0.90	0.37
Satisf <--> Subj Part	-0.62	-0.35	0.044	-7.98	0.00
Satisf <--> PJ	-0.54	-0.32	0.045	-7.05	0.00
Satisf <--> ATT	-0.23	-0.14	0.043	-3.27	0.00
Satisf <--> BEH	-0.25	-0.14	0.039	-3.70	0.00
Tenure <--> Subj Part	-0.06	-0.08	0.072	-1.09	0.28
Tenure <--> ATT	-0.22	-0.29	0.092	-3.18	0.00
Tenure <--> BEH	-0.17	-0.22	0.082	-2.68	0.01
Subj Part <--> PJ	0.69	0.70	0.08	8.80	0.00
Subj Part <--> ATT	0.27	0.29	0.07	4.04	0.00
Subj Part <--> BEH	0.28	0.28	0.07	4.31	0.00
PJ <--> ATT	0.57	0.63	0.09	7.15	0.00
PJ <--> BEH	0.50	0.53	0.08	6.70	0.00
ATT <--> BEH	0.44	0.48	0.08	5.73	0.00
Tenure <--> PJ	-0.14	-0.18	0.08	-2.18	0.03
Knowl <--> Tenure	0.04	0.03	0.04	0.75	0.45
Categ <--> Obj Part	-0.28	-0.03	0.01	-3.43	0.00
Categ <--> Satisf	-0.10	-0.04	0.02	-1.67	0.09
Categ <--> Tenure	0.34	0.29	0.05	5.40	0.00
Categ <--> Subj Part	0.16	0.11	0.04	2.81	0.01
Categ <--> PJ	0.11	0.08	0.04	1.87	0.06
Categ <--> ATT	0.12	0.09	0.05	1.97	0.05
Categ <--> BEH	-0.11	-0.08	0.04	-1.95	0.05
Categ <--> Knowl	0.15	0.05	0.02	2.59	0.01

Improving the Initial Measurement Model

One potentially problematic finding in the initial measurement model parameter results (Table 7 above) is the relatively high correlation between Knowl (Knowledge) and Obj Part (Objective Participation). A coefficient of -.80 (negative due to coding of the yes/no's on Objective Participation as yes = 1 and no = 2) is not high enough to justify merging the two latents; i.e., there is still adequate evidence of divergent validity, but the value is high enough to warrant closer examination of the two latents. Is there a source of overlap that can be modified so as to improve the interpretability of the model or, put another way, can we adjust the latents so as to have two more distinct measures (again, while avoiding a cross-loading solution)?

Examination of the content of the individual indicators suggests that q13. "I have been keeping track of CPP," could be interpreted as a "knowledge" item; i.e., *keeping track* of what is going on might be viewed as synonymous with *knowing* what is going on. This potential confusion is further evidenced in a relatively high (albeit not enormous) modification index of 20.8 (Table 8 below) between the error term for Q13 and the error for item Q10, "I would rate my knowledge of CPP as." Note, however, that the factor loading of Q13 on Obj Part is comparable to the other Obj Part indicators (.47 for Q13 versus .46 for Q14 and .59 for Q31 in Figure 3). Item Q13, then, appears to be interpreted ambiguously and may "muddy the waters" in terms of interpretability of the latents; therefore, it was dropped from the model. The resulting correlation between Knowl and Obj Part declined to a more acceptable -.65, providing evidence that the two indicators are now more distinct (in

comparison, dropping item Q14 from the model did not reduce the interlatent correlation at all).

A second potential improvement was suggested by further examination of the modification indices (MIs) in Table 8 below.

Table 8: Measurement Model 1: Modification Indices

Meas Model 1 (all PCA indicators)			
Covariances:		M.I.	Par Change
e20 <-->	e26	22.976	0.267
e20 <-->	e22	26.438	0.231
e20 <-->	e21	22.667	-0.2
e17 <-->	Satisf	25.453	-0.121
e11 <-->	e10	20.839	-0.068
Weights:		M.I.	Par Change
22m <--	22p	20.919	0.229
2n <--	1d	24.466	-0.305
1d <--	2n	28.567	-0.123
2d <--	22d	14.904	-0.13
2e <--	22d	10.75	0.094
q31 <--	q10	10.225	-0.066

Relative to the total Chi^2 of the model (764), none of the MIs are particularly large; however, two of the larger MIs are associated with the same two items: 1d and 2n (24.4 and 28.6). Note also another relatively large MI associated with the error term for 2n (e17) and the latent construct associated with 1d (e17 and Satisf = 25.4). This pattern suggests further examination of these items to ascertain their substantive implications for the model. Item 1d is somewhat distinct from its peer Satisf indicators in that it asks the respondent not if they are *satisfied* with the organization or their work, but if they would *recommend* the workplace to others. Similarly, item 2n is the sole survivor from the original "Status" construct: "Employees are important." Other Subj Part items have their origins in the Voice and Influence concepts. It appears that items measuring recommendation of the

workplace and perceptions of employees being important share common variance that their peer indicators do not. This connection is conceptually very interesting, but for purposes of this analysis, detracts rather than adds to the clarity of the measurement model. The decision was made to drop these items from the model in order to enhance interpretability of the latent constructs.

Further examination of MIs after the above adjustments were made indicate one more change at this phase of modeling: modeling of error covariances between e20 and e21 as well as between e20 and e22. While not excessively high, the modification indices associated with these covariances each exceed 20, suggesting potential benefit in modeling the PJ indicators as multidimensional (Kline, 1998). That is, the explicit modeling of error covariances among indicators within the PJ latent factor suggests the possibility of an unmodeled exogenous factor that accounts for variance in three of the four PJ indicators 22q, 22p and 22f. The nature of this unmodeled factor remains unknown for now (per Kline, 1998, high MIs on error covariances may mean redundant content, methods bias such as social desirability, or omission of an exogenous factor or common cause not currently in the model). The nature of this unmodeled factor is a topic that could be explored in future research.

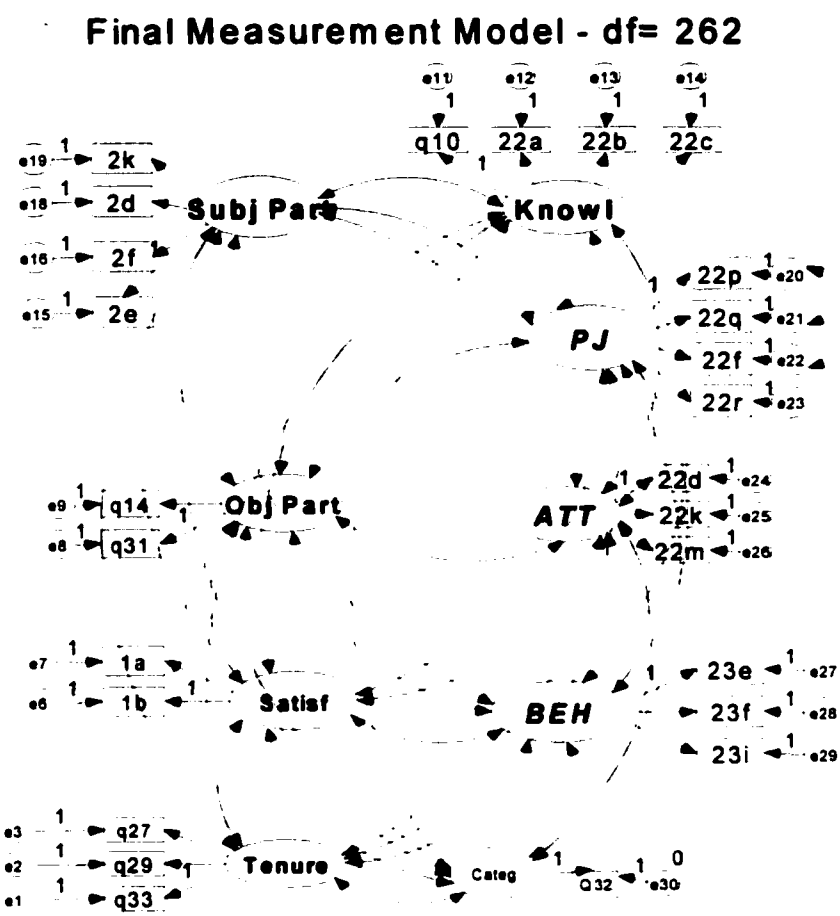
Note that the MI between 2m and 2p was evaluated as a possible adjustment candidate, but content of these items appeared to be consistent with their original latent assignments and congruent with meaning of other indicators assigned to these constructs. It was not clear that their deletion would benefit the model and a cross-

loading was deemed inconsistent with the goal of maintaining unambiguous interpretation of latents.

Revised Measurement Model

The model below (Figure 4) reflects the deletion of items Q13 (Obj Part), 1d (Satisf), and 2n (Subj Part), as well as modeling of error covariances for the PJ indicators. Goodness-of-fit measures, reported as "Measurement Model 2" in Table 6 above, improved slightly, but significantly over Measurement Model 1; that is, a Chi^2 difference of 289 with df = 80 is highly significant, and fit indicators are now within the "adequate to good" fit range, e.g., Chi^2/df=1.81; GFI, TLI, and CFI all exceed .90; and RMSEA is well under the .05 threshold. More than improved fit, however, the model is also more interpretable: individual latents are more distinct (i.e., all correlations among latents are well below unity) and ambiguous indicators have been removed.

Figure 4: Final Measurement Model



We now have evidence of a measurement model containing nine distinct but sometimes highly related factors; each factor, with the exception of Categ, being represented by a coherent and reliable set of indicators. Appendix C summarizes the correlation coefficients among the final set of latent variables; note that these coefficients may change in size and significance as we proceed into the structural modeling phase. It is now appropriate to move on to the Structural phase in which we directly test relationships among the latent constructs.

Structural Model Specification

Background

Analysis Goals for the Structural Analysis

The primary focus of this study is on the mediational pathways through which objective participation, or participation behavior, contributes to attitudes and behaviors around an organizational change, specifically a change in compensation/performance management in a public sector environment. The overarching hypothesis is that the simple, direct relationship between participatory behaviors and organizational outcomes that is often implied in research and practice will not be supported by these data. Specifically, the model explicates several psychological variables that intervene between the behaviors of participation and the behaviors associated with an organizational change. These mediating processes are perceptions of subjective participation, knowledge around the change, and perceptions of procedural justice or fairness, and we anticipate that the effect of objective participation on outcomes will be indirect via these variables.

In addition to these mediational pathways, this study seeks to explore relationships between certain exogenous contextual variables and the proposed path model: over and above the mediational model, does the inclusion of factors such as organizational satisfaction, length of service, and position in the organizational hierarchy benefit our understanding of the relationship between participation and outcomes? The specification of the measurement model lays the groundwork for explicitly testing these relationships. But, before we can examine specific mediational or control relationships, an overall model of the interrelationships must

be developed that exhibits qualities of parsimony, fit and meaningfulness. Individual parameters are then evaluated within the context of a preferred structural model.

Specification Strategy

As recommended by several authors (Anderson & Gerbing, 1988; Garson, 2001; Kline, 1998; MacCallum & Austin, 2000; MacCallum, et al., 1992; Tanaka, et al., 1990), this study deploys an "alternative models" strategy in which several models are specified based on theory and then compared in terms of their fit to the observed covariance matrix. As noted often in this paper, and as further amplified in Appendix A, a theory-based rather than empirically-driven approach is used as much as possible in the creation and evaluation of plausible models. This reduces the probability of capitalization on chance modifications (MacCallum, 1986; Silvia & MacCallum, 1988) and addresses the confirmation bias (reluctance to consider alternative models) identified by MacCallum & Austin (2000). Further, Kline (1998) notes that interpretation of results is dependent on the overall strategy: a deleted path based on purely empirical criteria (e.g., any parameter is deleted that does not meet a .05 significance threshold) is just another deleted path whereas a deleted path that was explicitly hypothesized to be significant is of greater interest.

There are areas in this analysis, however, in which theory plays a greater or lesser role. For example, the Introduction lays out a strong and thorough theoretical argument for the hypothesized path model or "causal chain" between objective participation and outcomes. There is less theoretical basis, however, for the initially specified relationships among controls or between the controls and the endogenous

variables. As a result, there will be more reliance on the data for identifying plausible control paths, i.e., use of significance tests of parameters in the saturated model. Modeling of direct and indirect relationships within the causal chain will not rely on empirical findings, however, as a major thrust of this paper, is the explicit test of specific mediational hypotheses. Alternative models that include or exclude these paths will be strongly biased toward theory, not the data.

Generation of Alternative Models

The hypothesized model as presented in Figure 1 (Introduction) is the logical first model to examine in this analysis. There are many alternative models, however, that could serve as plausible bases of comparison – how does one pick a reasonable set by which to evaluate the proposed model? Anderson and Gerbing (1988) offer a "nested model comparison" procedure that provides a systematic test of the proposed model as well as guidance to reasonable models for comparison.

Anderson & Gerbing outline a suite of five models ranging from a null or most parsimonious model (no relationships among latents) to a saturated or most complex one (all possible relationships specified among latents or equivalent degrees of freedom to the measurement model). More or less constrained models are identified, based on theory, and are placed on the continuum between these extremes with the hypothesized model representing, roughly, the midpoint. Specifically, a model is developed that represents a more constrained version of the hypothesized model (again, specifications based on relationships of theoretical relevance or interest) while another model is developed that represents a more unconstrained version of the hypothesized model, i.e., specific parameters freed

based on theoretical questions. Recall that a more constrained version of a model will have fewer parameters freed and a relatively higher Chi^2 than the hypothesized "midpoint," whereas an unconstrained version will have more free parameters and a lower Chi^2 or "better fit."

Using abbreviations suggested by Anderson & Gerbing (1988), we have, in order of increasing complexity, a most parsimonious null model (Mn), a constrained model (Mc), the hypothesized or theoretical model (Mt), an unconstrained model (Mu) and, finally, the most complex saturated model (Ms). Support for the hypothesized model is demonstrated when goodness-of-fit is significantly better than the next most constrained (Mc) and null (Mn) versions, but not significantly different from the more complex (Mu) and saturated (Ms) alternatives. That is, model fit approaches the "best" Chi^2 of the saturated model, but reflects the parsimony of a simpler model. Before providing details of the models, an overview of the specification process used in this study is necessary, as some adaptations of Anderson & Gerbing's approach were required prior to the comparison step.

Specification of the Alternative Models

While not explicitly recommended, Anderson and Gerbing, echoing recommendations of others (Garson, 2001; Judd and McClelland 1998), imply that single degree of freedom tests are most diagnostic, as one can clearly identify the source of improved/degraded fit. Also, since SEM is an analysis of the entire system of relationships, change in one path can substantially impact the relationships among the remaining factors. Given the number of parameters and complexity of relationships involved in these models, however, single degree of

freedom alterations (i.e., one parameter freed or constrained) may or may not provide substantively different or theoretically interesting alternatives.

In order to obtain meaningful constrained and unconstrained models to present in this paper, multiple degree of freedom alternatives were ultimately specified, but single parameter assessments were iteratively used, as necessary, to clarify the relative impact of changes. The goal was to present a manageable set of plausible and substantively meaningful competing models in which specific hypotheses could be evaluated. Getting to these plausible models sometimes involved several "model-in-progress" iterations that could not reasonably be presented here. Example iterations are available upon request.

It was also quickly evident that the proposed model (Figure 1 in Introduction) was misspecified, not in terms of the causal chain, but in how relationships among exogenous factors and between controls and endogenous factors were conceptualized. Testing mediational relationships seemed more meaningful within the context of properly specified controls; respecification and revision of the proposed model allow for examination of mediation (via Mu) within the context of the "best" set of control paths.

Several steps were taken to migrate the originally proposed model to a viable theoretical model (i.e., one that could better serve as a "mid-point" model for comparison purposes). More detailed review of the process can be found in the next sections; however, a brief summary of the approach may be helpful at this point. Initial changes were made to the proposed model in order to rectify convergence problems, yet keep it as close as possible to the originally developed model. No

changes were made to the causal chain and only one direct path was added to allow for convergence of the solution. It was clear at this point, however, that even with a "converged" solution, the paths associated with controls were not optimal. Significance tests of parameters in the saturated solution were used to guide redirection of control pathways, as the original set had extremely low and statistically insignificant parameter values. The resulting "revised" model will serve as the basis of comparison for more or less constrained options, as it corrects problems associated with convergence as well as poorly conceptualized initial control relationships.

For bookkeeping and clarity purposes, then, we will add two variants to the list of models proposed by Anderson & Gerbing. First, a new designation "**Mp**" will be used in reference to the model initially *proposed* in the Introduction of this paper. Anderson and Gerbing's "**Mt**" designation will be applied to the next version that was respecified in order to obtain a converged solution (the "*respecified* theoretical model" as described later). A new code **Mt'** will be used to identify the subsequent model that was produced in order to achieve a coherent set of control pathways (the "*revised* theoretical model"). Again, it is Mt', the revised theoretical model, that will be used as the basis for more constrained or unconstrained alternative models.

It is important to note that the resulting revised theoretical model (Mt') is not hierarchically linked with its predecessor Mt; i.e., the respecified theoretical model (Mt) with its original set of control pathways represents a qualitatively different set of expectations regarding control influences and is not nested under the

revised (Mt') model. This means that comparisons among the revised (Mt') and respecified (Mt) models cannot rely on the Chi^2 difference test, but must be made using the AIC, an index recommended by Kline (1998) and others (Garson, 2001) in comparing non-hierarchical models, as well as a more qualitative assessment of other fit indicators.

The unconstrained alternative (Mu) was then built based on the revised model (Mt') so direct comparisons between Mt' and Mu (and Ms) are possible using the sequential Chi^2 difference approach. Since the more constrained alternative (Mc) simply deleted all control pathways, i.e., hypothesizing that controls were not at all influential in the outcomes of organizational change, direct comparisons are possible in the "more parsimonious" direction. In the "Summary of fit" table below (Table 9), fit indices for the respecified theoretical model (Mt) are included for qualitative comparison purposes – again, the reader is reminded that direct comparison of Chi^2 results between this model and the more complex Mt' and Mu models is not advisable, as the models are not hierarchically related.

Plausible Alternative Models

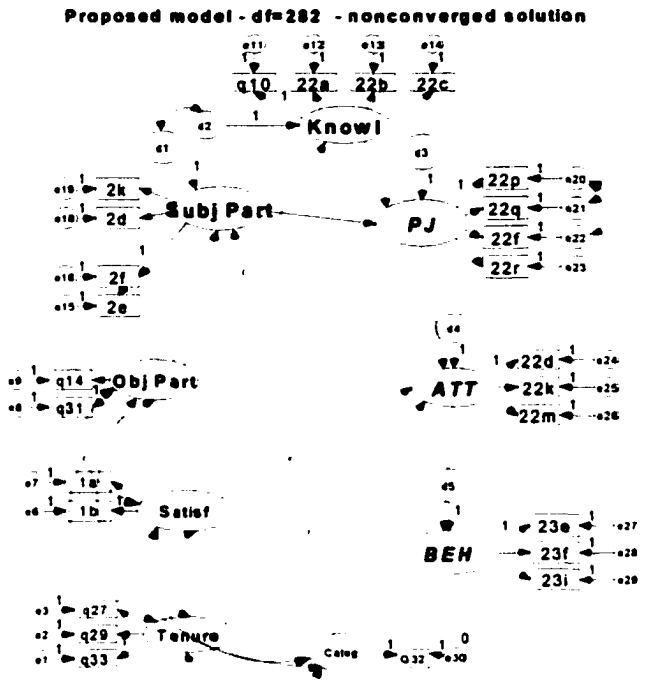
After a reacquaintance with the model proposed in the Introduction, five alternative nested structural models will be developed based on the strategy outlined above and compared using a sequential Chi^2 difference test. A sixth, non-nested model is represented by Mt, the respecified theoretical model. As noted earlier, direct comparisons between this model and more complex models is not advised, but qualitative assessments of its fit relative to alternative models are possible. A brief overview of each model and rationale for development is presented followed

by comparison of fit measures. The "preferred" model is then selected and parameters and pathways examined in more depth.

Review of Proposed Model (Mp)

The conceptual model outlined in the Introduction includes the core causal chain linking objective participation (Obj Part) to subsequent perceptions and outcomes, as summarized along with proposed control relationships in the AMOS model below (Figure 5 - note that we have had to reorient the original horizontal layout of the conceptual model to vertical as AMOS does not offer a "landscape" option). Specifically, Obj Part is hypothesized to impact both perceptions of Subjective Participation (Subj Part) and Knowledge regarding the pending change (Knowl). Subj Part and Knowl are, in turn, modeled to impact perceptions of Procedural Justice (PJ), which is anticipated to influence Attitudes toward the pending change (ATT) and, finally, ATT is expected to account for changes in anticipated Behaviors around CPP. More importantly, the model suggests that there are no direct effects leading from Obj Participation to PJ, ATT and Beh.; i.e., the influence of Obj Part is anticipated to be entirely indirect through the mediational chain. Further, the effects of Subj Part and Knowl on ATT are hypothesized to be completely mediated through PJ (no direct effects) and impact of PJ on BEH entirely mediated through ATT.

Figure 5: Proposed Model (Mp)



This model also offers specific hypotheses regarding the influence of control variables: perceptions of work satisfaction (Satisf) and employee length of service (Tenure) are expected to influence attitudes toward the proposed change over and above the influence of the causal chain, and position in the hierarchy (Categ) is anticipated to influence initial perceptions of Subj Part. Further, the model explicitly includes two unanalyzed associations (double-headed arrows representation correlations) among the exogenous variables: Satisf and Obj Part are anticipated to covary, as are Satisf and Categ. The rationale for these associations is presented in the Introduction. Other unanalyzed pathways are required in SEM models to maintain zero-order status of exogenous correlations (Judd, 2002), but do not reflect explicit hypotheses.

Structural models differ from measurement models in that they include a "disturbance" term for each endogenous latent (there are no endogenous variables in a measurement model). This quantifies the residual variance in each endogenous variable after impacts of modeled relationships are accounted for. Conceptually, a disturbance is an observed exogenous variable representing all omitted causes (Kline, 1998). Covariance among disturbances for Subj Part and Knowl (d1 and d2) is explicitly incorporated, as there is likely to be residual covariation between these two latents (within the same "block" in the model, Kline, 1998) over and above the covariation due to the shared common cause of Obj Partic (Judd, 2002).

Conceptually, covariance among disturbances can be thought of as a partial correlation between endogenous variables, controlling for common causes (Kline. 1998). Similar to the covariation of the measurement errors e20, e21 and e22 outlined in the Measurement Model section, the nature of this residual or "other common cause" covariance is not explicated in this model, only acknowledged as a hypothesized relationship. In order to maintain the "nested" nature of more complex alternative models, the disturbance and error term covariances are held constant throughout all models (with the exception of the disturbance term in the "Null" model). In general, these covariances were statistically significant and improved the fit of each model.

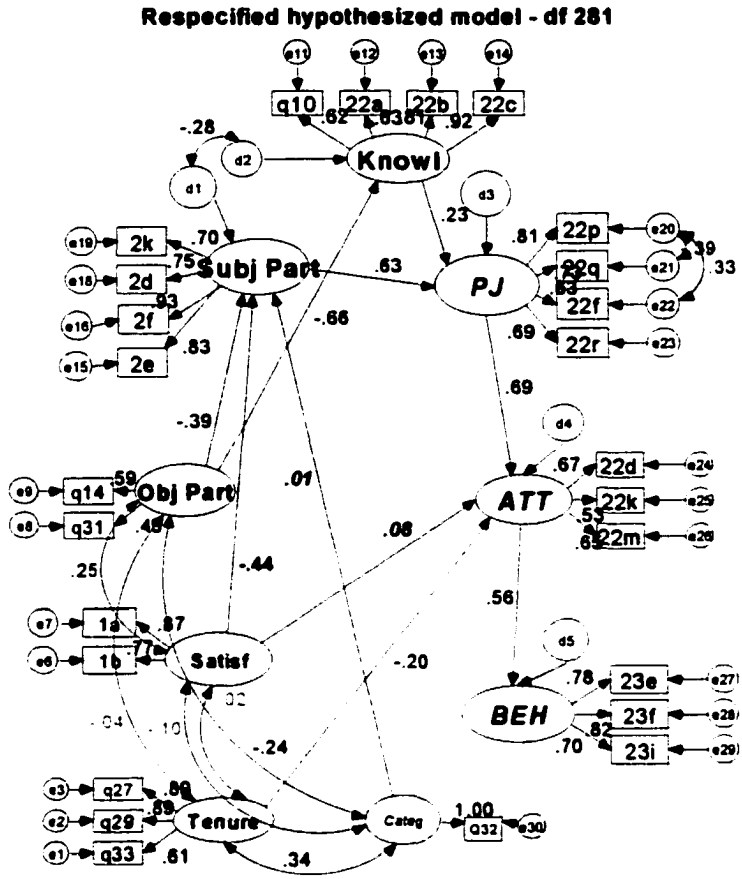
The above model (Mp) was submitted to AMOS (covariance matrix found in Appendix B) and an error message indicating the "the solution is not admissible" was output. Relatively little diagnostic information is provided with these error messages, but examination of the output indicated that the correlation between d1

and d2 was greater than 1.0, an untenable value. According to Anderson & Gerbing (1988), sometimes a first respecification is necessary due to nonconvergence, e.g., an incongruent pattern of covariances emerges due to initial misspecifications. They suggest that one can respecify one or more of the problematic indicators to different constructs (Anderson & Gerbing, 1988, p. 416) to resolve initial convergence problems.

Respecified Theoretical Model (Mt)

Because the convergence problem in Mp appeared to be related to the residual variance of Subj Partic and Knowl, it seemed reasonable to identify a possible linkage to one of these latents that might account for more variance in one of the factors. The output from the above model was not diagnostic, as the "inadmissibility" of the solution produced nonsensical coefficients and indices. Examination of direct path coefficients in the saturated model (described below), however, suggested a strong and significant path between Satisf and Subj Partic. The respecification (Mt) with this path is shown below (Figure 6) and resolved the convergence issue. Path coefficients are included in this diagram, as the resolution of the convergence issue revealed other respecification needs since several coefficients were unexpectedly small. It was clear that a revised model was needed prior to specification of other alternatives.

Figure 6: Respecified Theoretical Model (Mt)



The *Revised* Model (Mt')

Again, the goal in respecifying the original model was to maintain as much congruence as possible with the initially conceptualized pathways so evaluation of hypotheses could be accomplished. However, in reviewing the output from the above one degree of freedom respecification, it was evident that initial thinking regarding the unanalyzed and analyzed paths was not going to produce a substantively meaningful model. In Figure 6 above, several exogenous path coefficients (all coefficients reported are standardized) are very small and insignificant at .05; these low path coefficients are identified by italicized coefficients in the model.

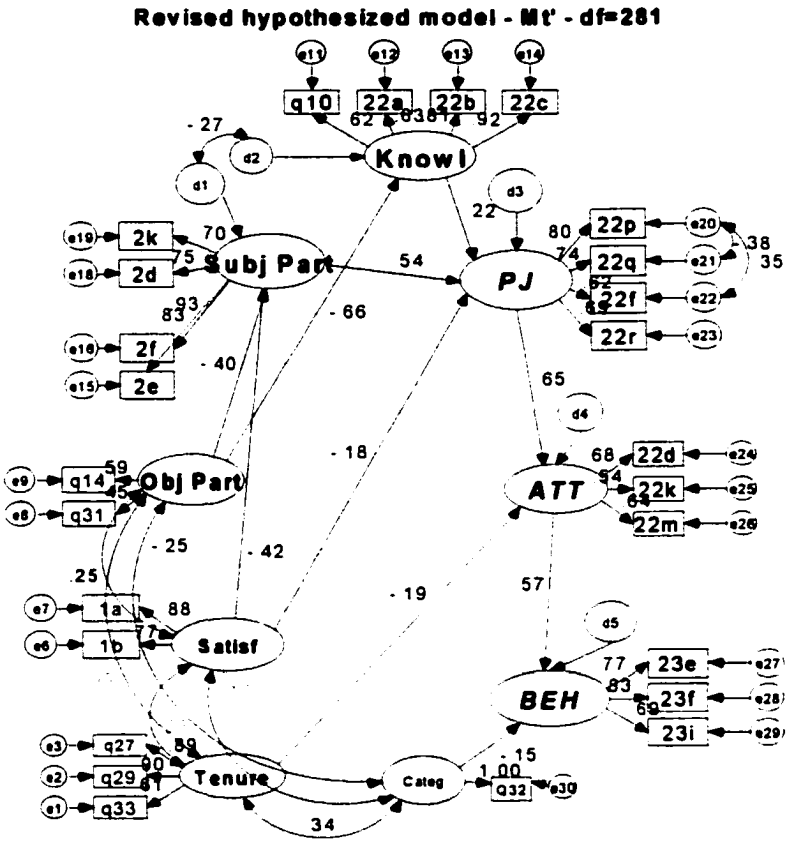
Specifically, statistically insignificant paths include the path between Categ and Subj Part (.01) and the path between Satisf and ATT (.08). While all correlation paths between exogenous factors must be retained, as noted earlier, it is worth noting that the correlation explicitly modeled between Satisf and Categ is among the smallest of the set (.10). Other exogenous relationships, i.e., those not initially predicted, appear to be more substantial: Categ and Obj Part (-.24) and Categ and Tenure (.34). The substantive implications of these unexpected relationships will be overviewed in a later section ("Review of preferred model"). For now, however, our attention is focused on the analyzed or direct paths that are unlikely to be helpful in understanding the dynamics of the model.

As discussed in the previous sections, tests of mediational pathways should be more meaningful in the context of correctly specified control relationships. As there was inadequate theory by which to specify new relationships, path coefficients from the saturated model (Ms) were examined for candidate pathways. Kline (1998) notes that there tends to be an over-reliance on significance tests in assessing the relative value of parameters: significance tests are not entirely diagnostic because they reflect sample size, size of effect and intercorrelations among variables (recall that relationships are modeled simultaneously, thus path coefficients can change depending on what other variables or paths are included in the model). He suggests effect size be considered along with significance levels with "smaller" effects or those around .10 (standardized) being targets for trimming (as additional "rules of thumb," Kline suggests that effects at or around .30 are considered "medium" and above .50 are considered large). Deleting statistically significant, but

benign paths moves us toward the goal of parsimony: the inclusion of these paths adds little to interpretation and their exclusion can better crystallize key relationships in the data.

This is an instance where more than one modeling iteration was needed to arrive at the final revised model (as described in the Background section above). All viable control paths were initially included, but several that were marginally significant or fairly small in the original list became either insignificant or even smaller in subsequent models. These paths were eventually dropped from the model. The revised model below (Figure 7) represents the end point of these iterations – details regarding the intervening models are beyond the scope of this paper, but are available upon request. As noted earlier, we cannot directly compare the Mt and Mt' models as they are not nested. However AIC results for the original model Mt (730) and the revised model Mt' (669) further support the move from a less meaningful original model to a revised model with better representation of control relationships, as a lower AIC is evidence of improved fit.

Figure 7: Revised Model (Mt')

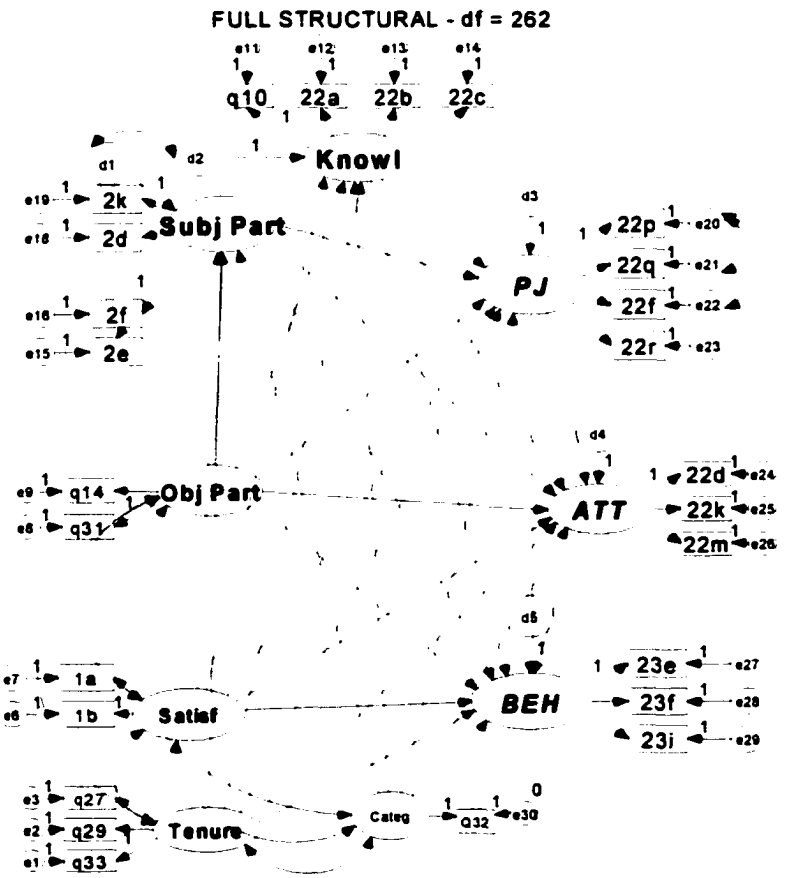


Details regarding the path coefficients and implications of these new control relationships will be saved for a later section (the detailed examination of the "preferred" model which includes these paths), as the focus in this section is on "global" fit comparisons among alternative models. For now, this revised model (Mt') will serve as the midpoint model in the nested comparison process. The constrained and unconstrained versions of this model will be outlined after very brief overviews of the "extreme" points of the comparison: the most complex saturated model (Ms) and the most parsimonious null model (Mn).

Saturated Model (Ms)

A saturated structural model is equivalent to the measurement model; all possible associations between latents are modeled either in the form of an unanalyzed or correlational relationship (exogenous < --- > exogenous), analyzed or directional path (exogenous ---- > endogenous), or covariance between disturbances. The "full" structural or saturated model has the same degrees of freedom as the measurement model (Figure 4) and it's mathematical equivalent, therefore fit indices are the same. Figure 8 presents the saturated model used in this study.

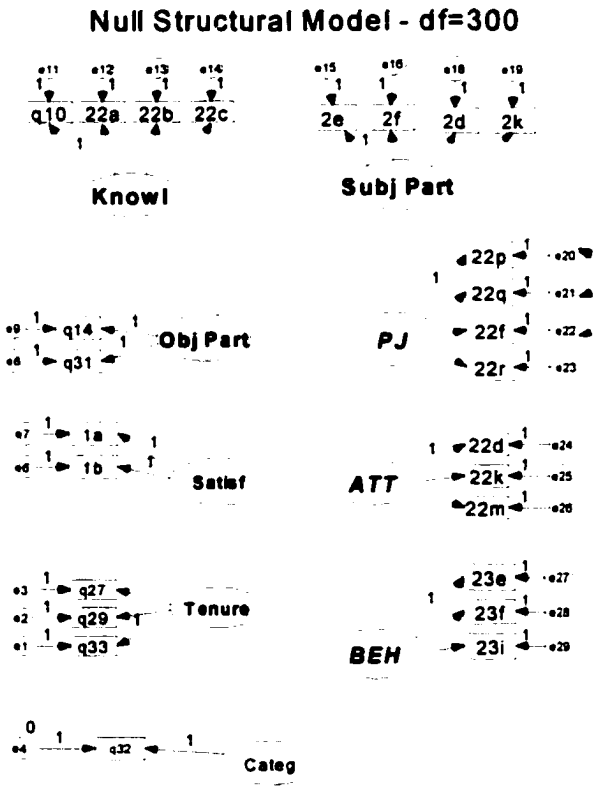
Figure 8: The Saturated Structural Model (Ms)



Null (Mn)

The null model (Figure 9) is the most parsimonious model with no paths specified between any latent factors. Conceptually, this model suggests that there are no significant relationships among the factors and serves as a baseline for evaluating the relative contribution of modeled relationships.

Figure 9: The Null Model (Mn)

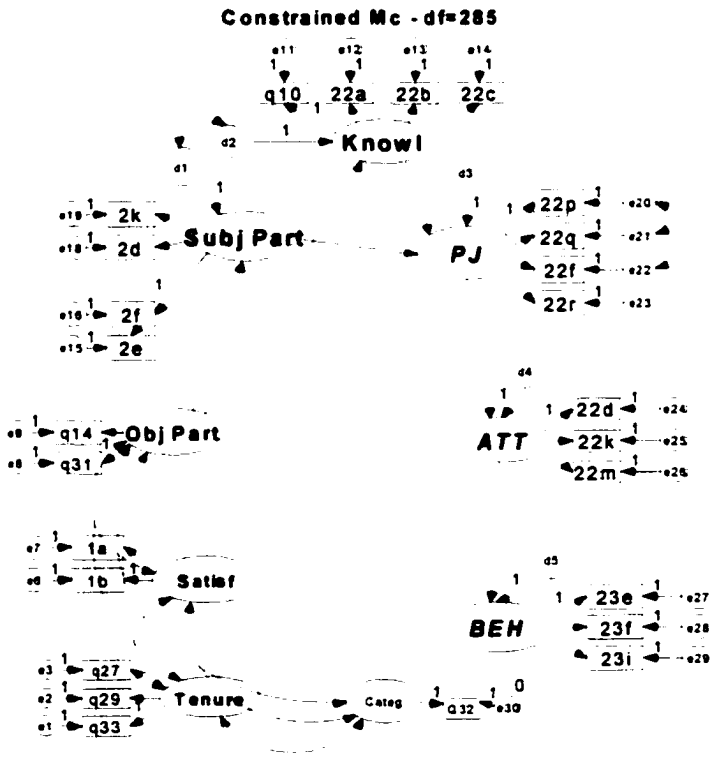


Constrained Model (Mc)

The constrained model is more complex than the null model, but remains more parsimonious than the hypothesized model. Numerous models could be utilized here given the relatively large number of paths that could be incrementally deleted from Mt'. Again, following Anderson & Gerbing's (1988) recommendations for meaningful testing, this model was used to test a hypothesis

that controls, as a set, are helpful in explaining variance in the factors. In effect, this model (Figure 10 below) asks if the exclusion of the paths from these control variables makes any difference in modeling perceptions of subjective participation, procedural justice, attitudes or anticipated behaviors. Is it worth considering these types of individual difference factors in a process model? The answer is most likely yes, but the empirical confirmation of the value of these factors will provide solid evidence to support their inclusion.

Figure 10: Constrained Structural Model (Mc)



If goodness-of-fit of Mc is significantly worse than the more complex hypothesized model (Mt'), we can conclude that the controls are valuable in explaining the participation relationships. In the other direction, if the fit of this model (Mc) is not significantly better than more parsimonious the null model (Mn),

we may need to ultimately question the overall value of the causal chain itself. Comparison of Mc with both Mn and Mt' are multiple degrees of freedom tests, so it will not be clear from these comparisons which controls or possible relationships might be more or less significant. These evaluations are left for the more complex models (i.e., significance tests and effect size of parameters).

Unconstrained model (Mu)

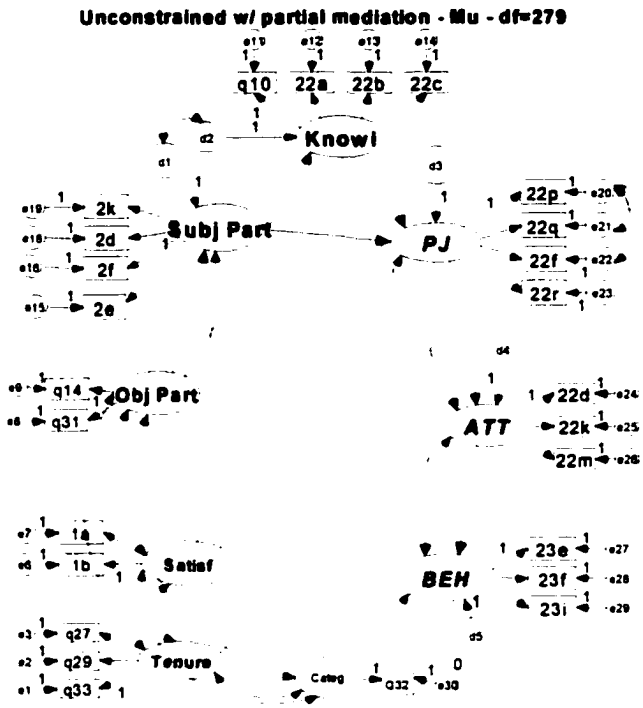
Consistent with the goal of meaningful model comparisons, this model allows us to test perhaps the most crucial set of hypotheses in this paper: those regarding mediation in the causal chain. Recall that revised theoretical model (Mt') only incorporates new paths for the control latents and there were no changes made to the core causal chain that hypothesizes complete mediation across all latents. It is appropriate to use more complex models as a vehicle for testing specific, a priori hypotheses regarding the existence and level of mediation between the structural latents. At this phase of the analysis, then, we are examining if the addition of specific directional paths improves the overall fit of the model; depth interpretation of effects will be left for a later section.

Similar to the development of the revised model (Mt'), the development of the unconstrained model required more than one iteration. In this case, all relevant direct paths within the mediational chain were initially included in the model and retained if they were statistically significant. The four paths tested were those of greatest substantive interest and those specifically explicated in the hypotheses articulated in the Introduction.

First, is the relationship between objective participation and perceptions of procedural justice mediated by subjective participation and knowledge; i.e., is the direct path from Obj to PJ statistically significant? This tests the hypothesis that interpretations of participation "opportunities" are more critical in forming justice perceptions than are overt behaviors of participation. Second, is the relationship between subjective perceptions of participation and attitudes about the change (direct effect from Subj Part to ATT) mediated by perceptions of justice (PJ) or does the interpretation of participation directly contribute to attitudes regarding the proposed change? Similarly, does knowledge of CPP direction impact attitude perceptions (Knowl to ATT), or is this effect entirely or partially mediated by PJ? Finally, a path was modeled between PJ and BEH, testing the hypothesis that the influence of procedural justice on anticipated behaviors is mediated by attitudes; i.e., positive evaluations of procedural justice are linked with improved attitudes about the pending change, which, in turn, influence anticipated behaviors.

After several iterations (again, not presented here due to space constraints), the model in Figure 11 was derived for use as Mu.

Figure 11: Unconstrained Alternative Model (Mu)



The resulting model frees two of the four parameters described above: a direct path from Knowl to ATT and one from PJ to BEH. The direct paths between Obj Part and PJ and between Subj Part and ATT did not remain statistically significant through the iterations, so they are not included in the final model. Again, the substantive implications of these inclusions (and exclusions) will be amplified later, but it is worth noting that this is where support for the overarching theme of this paper is finally evident: these findings support the overall hypothesis that the effects of objective participation or participation behavior on outcomes is best conceptualized as indirect, not direct. That is, the "direct link" so often assumed between "opportunity to participate" and outcomes is virtually non-existent, as there are no statistically significant direct pathways between Obj Part and subsequent endogenous variables (except for the proximal Subj Part and Knowl paths). Without

understanding or documentation of intervening psychological processes and evaluations, it is not surprising that we see "inconsistent and insufficient" relationships between these two variables in the literature and in practice.

Now that a series of nested models have been derived that are theoretically meaningful, we can move on to comparisons to identify the model that best meets the goals of replicating the observed covariance matrix (fit) while being parsimonious and substantively interesting. Once this model is selected, we will "tell the story" of parameters, effects, and residual variance.

Comparison of Fit and Identification of Preferred Model

A summary of fit indices for the six models described above are presented in Table 9. Models are presented in order from most parsimonious (Mn) to most complex (Ms) and differences between relevant models are provided beneath the fit indices for each model. In the table, column heading CMIN represents the Chi^2 for the model, DF represents degrees of freedom for the model, P is significance or probability that the Chi^2 value obtained would have been observed by chance when the model exactly fits the population (a "p" value for the Chi^2), PAR is the number of parameters estimated in the model, and C/DF refers to the Chi^2 per degrees of freedom. The remaining columns are self-explanatory (details regarding goodness-of-fit indices can be found in the Appendix) with the exception, perhaps, of RMSEALO and RMSEAHI, which provide the lower and upper bounds of the confidence interval around RMSEA.

All difference calculations are between the model of interest and the model that is next most complex. For example, the revised model, Mt', is compared with

Mu, the unconstrained version immediately following it in the table (diff Mu-Mt'), showing a Chi^2 difference of -29.0 (a decrease in value as expected given the movement from more to less complex) with a degree of freedom difference of 2 interpreted as a significant difference between the two models. Differences between other fit indicators such as NFI or RMSEA cannot be formally compared, but per Widaman's (1985) "rule of thumb," a difference greater than .01 can be interpreted as at least "interesting." Also, it is important to remember that comparisons between the respecified model Mt can only be made at a qualitative level, i.e, it is not nested beneath Mt' or Mu.

Table 9: Comparison of Fit Across Structural Models

	CMIN	DF	P	PAR	C/DF	GFI	AGFI	NFI	TLI	CFI	RMSEA	RMSEALO	RMSEAHI
Null Model Mn	1123.5	300	0.00	51	3.75	0.79	0.75	0.74	0.78	0.79	0.087	0.082	0.093
Independence	4298.7	325	0.00	26	13.20	0.38	0.34	0.00	0.00	0.00	0.184	0.179	0.189
diff Mc-Mn	*-528.8*	*15*	*0.00*	*15*	*-1.66*	*-0.10*	*-0.11*	*-0.12*	*-0.14*	*-0.13*	*-0.032*	*-0.033*	*-0.032*
Constrained - no control effects Mc	594.7	285	0.00	66	2.09	0.89	0.86	0.86	0.91	0.92	0.055	0.049	0.061
diff Mt'-Mc	*-64.1*	*4*	*0.00*	*4*	*-0.20*	*-0.01*	*-0.02*	*-0.02*	*-0.02*	*-0.02*	*-0.005*	*-0.006*	*-0.005*
Respecified Theor. Model Mt	546.0	281	0.00	70	1.94	0.90	0.87	0.87	0.92	0.93	0.051	0.045	0.058
	not nested				*-0.06*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*-0.001*	*-0.002*	*-0.002*
Revised Theor. Model Mt'	530.6	281	0.00	70	1.89	0.90	0.88	0.88	0.93	0.94	0.050	0.043	0.056
diff Mu-Mt'	*-29.0*	*2*	*0.00*	*2*	*-0.09*	*-0.01*	*-0.01*	*-0.01*	*-0.01*	*-0.01*	*-0.003*	*-0.003*	*-0.002*
Unconstrained - Direct effects Mu	501.7	279	0.00	72	1.80	0.91	0.88	0.88	0.94	0.94	0.047	0.040	0.054
diff Ms-Mu	*-26.6*	*17*	*ns*	*17*	*0.01*	*-0.01*	*0.00*	*-0.01*	*0.00*	*0.00*	*0.001*	*0.001*	*0.000*
Saturated Model (df=MM) Ms	475.1	262	0.00	89	1.81	0.91	0.88	0.89	0.93	0.94	0.048	0.041	0.054

numbers may not tie due to rounding

Again, the Chi^2 difference test evaluates significance of improvement or decrement in fit as paths are added or deleted from a model. A non-significant difference between two nested models indicates that fit between two models is comparable and the less complex model is preferred for parsimony reasons (Garson, 2001; Kline, 1998). A significant difference in a "trimming" situation, i.e., moving from more complex to less complex, suggests that path deletion may have gone too far. A significant difference when building models, i.e., moving from less complex

to more complex, suggests that the path(s) be retained due to improved overall fit. Recall that Chi^2 is sensitive to sample size, i.e., a "significant difference" with a large sample might be interpreted as trivial from a substantive point of view. Anderson & Gerbing (1988) suggest that practical criteria, such as interpretation and context of the parameter change, also be included when judging differences in fit, especially in "borderline" cases.

Several of the alternative models, including the respecified (Mt) and revised (Mt') theoretical models, exhibit what might be described as at least "adequate" fit. In the case of the four most complex models (Mt, Mt', Mu and Ms), Chi^2 per degrees of freedom (represented as C/DF in the table) is less than 3.0, several indicators hit the .90 threshold, and the confidence interval around RMSEA in all cases includes .05. Only the constrained (Mc) and null (Mn) models show evidence of less than adequate fit. The constrained model is "hovering" on adequate fit based on Chi^2 per degrees of freedom (C/DF = 2.09), but other indicators are barely reaching the desired thresholds. For example, while the lower confidence boundary of RMSEA (RMSEALO) has crossed the .05 threshold at .049, GFI, AGFI and NFI are under .90 and TLI and CFI are over .90. The Mn model, i.e., the one that specifies no relationships among factors, poorly fits the observed matrix, as expected; i.e. we expect some level of relationship among these variables, otherwise we would not have pursued the study.

Since several models exhibit reasonable fit, we proceed to the comparison process (if none or only the most complex model fit the data, comparisons would not be relevant: we would tend not to prefer a poorly fitting model, no matter what

the Chi^2 difference). Moving from least to most complex beginning with the "borderline" adequate Mc model, we note that the difference between the Mt' and Mc models is highly significant at -64.1 with a difference of four degrees of freedom (the dropped directional paths from controls to the endogenous variables). This suggests that the addition of control effects is, indeed, warranted due to substantially improved fit; differences among other indicators, e.g., 0.02 for NFI, TLI and CFI add further evidence for the inclusion of some combination of control latents.

Compared to the more constrained revised hypothesized model (Mt'), the next most complex model, Mu, demonstrated improved fit with a very significant Chi^2 difference of 29.0 with 2 degrees of freedom. This provides evidence in support of the addition of direct pathways; i.e., evidence that there is partial, rather than complete, mediation within the causal chain. When Mu is compared to the most complex, saturated model, it appears that we have reached a threshold of "complex enough." That is, the Chi^2 difference between Ms and Mu just misses being statistically significant at .05 with a difference of 26.6 and 17 degrees of freedom (critical value = 27.6). Examination of other fit indicators reveals almost no differences between the two models, yet the Mu model is more parsimonious, allowing us to tell a causal "story" among the latents.

Incorporating direct paths in the causal chain substantially improved fit compared to the revised hypothetical model Mt' (even a conservative qualitative comparison with the initial Mt would conclude that the additional paths substantially improve fit), yet we appear to have reached a boundary of "complex enough without

too complex" as compared to a saturated model. Given that the balance of fit information suggests an improved fit over Mt', yet comparable model with Ms, Mu will be selected as the "preferred" model. Most importantly, the preferred model offers a basis to examine and test the mediational hypotheses set forth in the Introduction. The next section will present the preferred Mu model with associated parameter estimates for further explication of relationships in the model. At this point, it is worth noting that we are effectively rejecting the originally developed model; specifically, we are rejecting the hypothesis that mediation is complete throughout the chain. This conclusion will be amplified in the following sections.

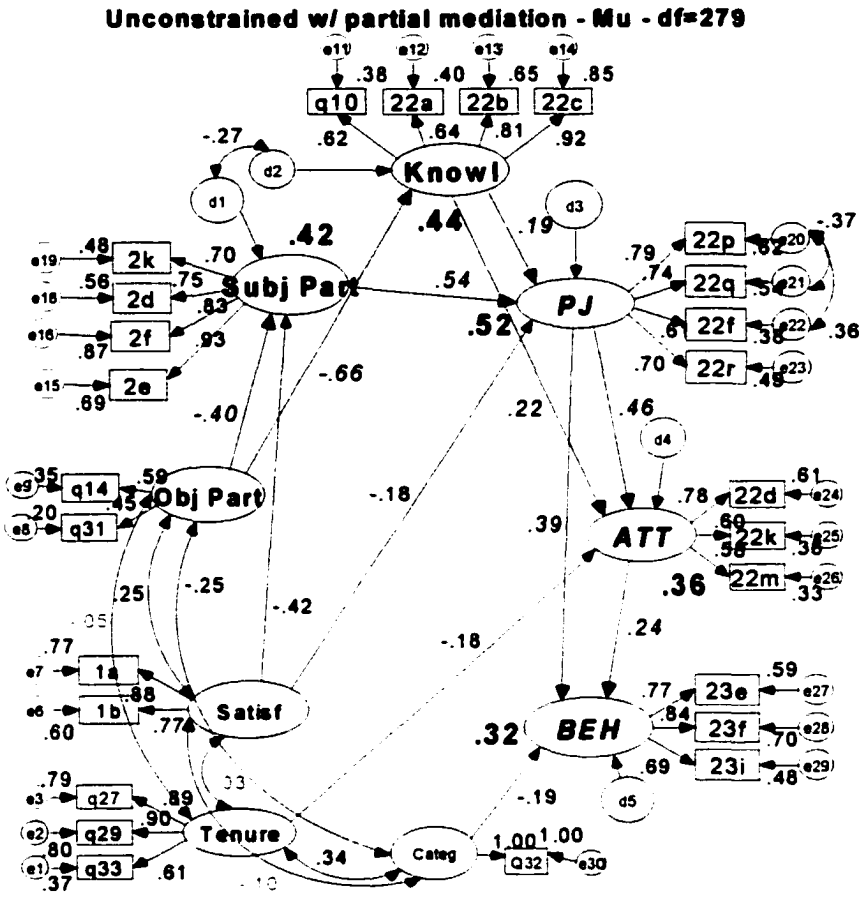
Preferred Model – Detailed Review

While model fit is an important first step in evaluating our hypotheses (e.g., it makes no sense to evaluate parameters in a model that has very poor fit), fit is a global, not specific form of analysis. Per MacCallum & Austin (2000), it is critical to pay attention to parameter estimates even when fit is good – are they consistent in size and sign with theory? with the stated hypothesis? In addition to examination of parameter estimates, squared multiple correlations will be reported to determine if our "good fitting model" accounts for miniscule or modest amounts of the variance in key endogenous variables. According to MacCallum & Austin (2000), an amazing number of published papers stop at the "goodness of fit" level and do not examine the explanatory power of the model (e.g., 50% of the approximately 500 studies reviewed did not report proportion of variance explained). Fit and meaning

are two different issues: we have established fit; this section deals with meaning and interpretation.

Below is the preferred structural model with parameter estimates (Figure 12). All coefficients are standardized (see Table 10 for unstandardized output and associated significance tests) and, to ease reading, squared multiple correlations associated with endogenous variables (representing variance explained via predictors) are in larger bold font, path coefficients associated with the causal chain are italicized, and coefficients associated with controls (and disturbances) are in "normal" font. Note that the non-significant coefficients associated with the required exogenous covariances are differentially shaded to identify them as methodologically required in SEM analyses, but meaningfully irrelevant.

Figure 12: Final Structural Model – Standardized Coefficients



For readers with a preference for tabular data, parameter estimates are also summarized, along with significance testing of unstandardized estimates in Table 10 below. Recall from the measurement section that Satisf and Obj Part are coded such that a more positive response, e.g., "yes, I was a team member" or "I am very satisfied with my job," is "1," whereas more negative responses are coded as a 2 or higher. Negative parameter estimates for these factors are indicative of a more favorable influence on the dependent variable. For example, the path coefficient from Satisf to Subj Part of -.42 suggests that the more satisfied the employee is with their work situation, the more positively they interpret their participation experience.

Similarly, the -.66 path from Obj Part to Knowl suggests that higher levels of participatory behavior reported by the employee are associated with higher levels of knowledge about CPP.

Table 10: Final Structural Model Standardized and Unstandardized Coefficients

Parameter estimates - "Preferred" Model - Mu

Path Coefficients

		Stand	Unstand	S.E.	C.R.	P
Subj Part	<-- Obj Part	-0.40	-2.64	0.66	-4.03	0.000
Knowl	<-- Obj Part	-0.66	-2.15	0.44	-4.94	0.000
Subj Part	<-- Satisf	-0.42	-0.94	0.14	-6.65	0.000
PJ	<-- Knowl	0.20	0.40	0.10	3.89	0.000
PJ	<-- Subj Part	0.54	0.54	0.06	8.45	0.000
PJ	<-- Satisf	-0.18	-0.40	0.14	-3.00	0.003
ATT	<-- Tenure	-0.18	-0.16	0.05	-3.10	0.002
ATT	<-- PJ	0.46	0.49	0.07	6.61	0.000
ATT	<-- Knowl	0.22	0.48	0.14	3.42	0.001
BEH	<-- ATT	0.24	0.23	0.08	3.01	0.003
BEH	<-- Categ	-0.19	-0.28	0.08	-3.55	0.000
BEH	<-- PJ	0.39	0.39	0.08	4.99	0.000

Correlations

Obj Part	<--> Satisf	0.249	0.02	0.01	2.94	0.003
Tenure	<--> Categ	0.34	0.29	0.05	5.37	0.000
Obj Part	<--> Categ	-0.25	-0.03	0.01	-3.34	0.001
Satisf	<--> Categ	-0.1	-0.03	0.02	-1.71	0.087
Satisf	<--> Tenure	0.026	0.02	0.03	0.43	0.669
Obj Part	<--> Tenure	-0.047	-0.01	0.01	-0.68	0.499
d1	<--> d2	-0.273	-0.08	0.03	-2.57	0.010
e20	<--> e21	-0.369	-0.22	0.05	-4.90	0.000
e20	<--> e22	0.358	0.29	0.07	4.09	0.000

Explanatory power of the model, as indicated by the squared multiple correlations, will be discussed first, followed by a review of parameters specifying direct and correlational relationships (i.e., the path coefficients displayed in the above model). Mediational and total effects will then be examined. To close out the Results section, findings from this structural analysis, as well as the measurement model, will be summarized relative to the hypotheses articulated in the Introduction.

Explanatory Power

Before discussing individual parameters or pathways, it is worth confirming that the model sufficiently explains variance in the key endogenous latents. The squared multiple correlation for each endogenous variable, or proportion of variance accounted for by its predictors (Arbuckle & Wothke, 1999), is shown in large bold type adjacent to each endogenous variable. In general, the model appears to do a good job in accounting for variance in these factors. The predictors for Subjective Participation (Subj Part) and Knowledge (Knowl) are accounting for over 40% of variance in these latents and over 50% of variance has been accounted for in the Procedural Justice (PJ) factor. As predicted by theory outlined in the Introduction, knowledge and perceptions of influence or voice (as captured by Subj Part) appear to help explain variance in perceptions of fairness or justice.

Variance explained for Attitudes (ATT) and Behaviors (BEH) is slightly lower (.36 and .32 respectively). Given that behaviors are multiply determined (i.e., situational factors that impinge on behavioral choices) and that attitudes toward merit-based pay in the public sector are likely to be based on other beliefs and values, the amount of variance explained by predictors in this model is satisfactory. The shift from a public sector to private enterprise model of compensation and performance management represents an enormous shift in culture, and arguably, work identity for employees (Sikora, 2001). The participatory process around CPP may help in the shift from "old" attitudes and behaviors to "new," but it is clearly not a "silver bullet" for organizational change.

Parameters for Direct Effects

Before discussing specific parameters, a brief review of the meaning of these parameters may be helpful. Direct path coefficients on endogenous variables can be interpreted much like beta weights in a multiple regression context (i.e., a multiple predictor equation). Specifically, in the case of standardized coefficients, we can talk about direct path coefficients as being the expected standard deviation change in the dependent variable (endogenous latent) given a one standard deviation change in the independent variable (endogenous or exogenous), controlling for all other variables (Kline, 1998). Standardized path coefficients, as in regression, allow us to compare direct effects on given endogenous or relative importance of the independent variables in predicting variation in that latent (Garson, 2001). There are also indirect and total effects as a result of mediation that do not appear as parameters in the diagram – these will be discussed after an overview of direct effects.

Given the number of parameters in the above model, it may be most straightforward to start at the beginning of the causal chain (i.e., with Obj Part) and discuss influence of predictors on the respective latents comprising the chain. Correlations among the controls will be discussed at the end of this section (double-headed arrows in the model are indicative of an unanalyzed relationship or correlation and are interpreted as a Pearson R coefficient).

Objective Participation (Obj Part)

Starting with Obj Part, there are two factors that appear to be associated with the level of participatory behaviors of employees (these are correlational, i.e., not

direct effects, as Obj Part is an exogenous variable in this model). Specifically, Categ or position in the hierarchy is related to Obj Part such that being higher in the hierarchy (managers and supervisors followed by professional staff, then administrative employee) is associated with tendency to engage in participatory behaviors (-.25, p = .001). Satisf or satisfaction in the workplace is related with Obj Part such that more satisfied employees appear to be more likely to be involved in participatory activities (.25, p = .003). These results are interesting, as it is often the "rank-and-file" or the more dissatisfied employees who are the overt target of participatory efforts. These results suggest that, at least in this situation, it is the higher level, more satisfied employee who is more likely to be involved in teams or feedback sessions.

Subjective Participation (Subj Part)

Perceptions or interpretations of the participatory opportunity (Subj Part) appear to be primarily and strongly driven by the participatory behavior itself (path coefficient from Obj Part = -.40, p = .000) and overall satisfaction with the workplace (path from Satisf = -.42, p = .000). These coefficients suggest that not only does the level of participation influence perceptions of influence or voice (Subj Part), but the baseline positive or negative orientation of the employee to the workplace serves as an important context for these perceptions. In other words, participatory opportunities within a context of employee satisfaction may have much more positive impact on the organization than the same opportunities within a context of employee *dis*satisfaction.

Note also that some of the variance explained in Subj Part can be attributed to Knowl (and vice versa) due to the correlated disturbances d1 and d2 (coefficient = -.27, p = .01). As noted earlier, this correlation between the residual variance suggests that there is some "common cause" shared between these two latents over and above the shared common cause of Obj Part. Again, because this residual variance is conceptually an unspecified exogeneous variable, the meaning of the correlation is not clear. In the measurement model, as we were "distilling down" the four originally proposed "subjective participation" factors to two, it was evident that there remained some level of relationship between the two remaining factors (i.e., they measure distinct constructs as confirmed via CFA, but are clearly not entirely independent). The nature and implications of this relationship is a fertile opportunity for future research.

Knowledge About CPP (Knowl)

Apart from the shared residual covariation captured in d1 and d2, knowledge about the organizational change is influenced primarily and powerfully by participatory experiences (path from Obj Part = -.66, p = .000) such that those who participate are more likely to know more about CPP. This implies a strong information function of participation. Note that while both direct effects from Obj Part to Knowl and Subj Part are relatively large, the coefficient from Obj Part to Knowl (-.66) is larger than the one from Obj Part to Subj Part (-.40). These coefficients suggest that participation, at least in this situation, has slightly more influence on the employees' knowledge base than on their subjective sense of involvement.

Procedural Justice (PJ)

Knowledge and satisfaction contribute modestly to perceptions of procedural justice or fairness (.19, p = .000 and -.18, p = .000 respectively), but perceptions of subjective participation (Subj Part) appear to be more influential (.54, p = .000) in predicting this factor. Note here, again, the impact of general work satisfaction within the causal chain: employees are more likely to have positive perceptions of justice or fairness if they are already feeling positive about the workplace. This is not as large an effect as the direct path from Satisf to Subj Part, but provides further evidence that the impact of a priori workplace satisfaction needs to be more actively accounted for in discussions around participation, fairness and organizational change. The differential direct effects on PJ of Subj Part (.54) and Knowl (.19) is a bit surprising as we anticipated that these intermediary variables would be a bit more similar in their impact in the model. These results suggest that while knowledge of situational facts certainly aids employees in forming positive perceptions of fairness regarding CPP, a sense of voice or influence is more likely to result in perceptions of procedural justice.

Attitudes About CPP (ATT)

Three factors appear to directly account for variance in ATT or attitudes about the merit-based pay plan. Procedural justice (PJ) perceptions positively and strongly impact these attitudes (path coefficient = .46, p = .000) such that more positive perceptions of fairness are strongly linked with more positive attitudes toward CPP. Knowledge, while having a modest direct impact on attitudes, will

ultimately exhibit additional impact due to mediation via procedural justice (discussed in the sections on indirect and total effects).

While highlighted later in the Discussion section, it is important to note here that the "causal chain" from Obj Part to ATT is different when traced through Knowl than when traced through Subj Part. Obj Part has a strong direct effect on Knowl, which has modest, but multiple effects on ATT, partly through PJ as well as its own direct effect on ATT. Subj Part, on the other hand, is driven a bit less strongly by Obj Part, but has a very strong effect on PJ; its impact on ATT, however, is entirely indirect through PJ. It is apparent that subjective participation and knowledge play important, but different roles in predicting organizational outcomes associated with participation.

Finally, length of service in the organization (Tenure), a control variable, also impacts attitudes (-.18); the impact is negative such that the longer an employee is in the organization, the more negative their attitude towards CPP. As discussed in the Introduction, it is possible that longer term employees have more experience with change in the organization, specifically negative or failed changes, and are more doubtful as to the benefits of proposed programs.

Behavior (BEH)

At the end of the causal chain are employee expectations regarding their compliance with the desired behaviors of the proposed compensation/performance management system. Attitudes toward the proposed system are significantly, but only modestly influencing these behavioral (path coefficient = .24, p = .003) such that more positive attitudes toward the merit-based pay plan lead to employees

reporting that they are more likely to engage in the desired behaviors. The voluminous social psychological literature on the tenuous linkage between attitudes and behaviors (e.g., Fazio, 1986; Fishbein & Azjen, 1975; LaPiere, 1934) tempered expectations that this path coefficient would be large. However, a statistically significant and modest direct effect suggests that efforts to create positive attitudes regarding the new program may pay off in behavioral compliance or at least may motivate workers in the desired behavioral direction.

Consistent with previous work (Konovsky, 2000; Robbins, et al., 2000), BEH is quite strongly influenced directly by procedural justice perceptions (path coefficient = .39, p = .000). This suggests that when employees believe a procedure or process will be fair, they are not only likely to have improved attitudes about the process, but are more willing to comply with new behaviors required of the system. Fairness, then, appears to have potential impact, albeit modest, on employee behaviors as well as attitudes regarding CPP.

Finally, we note that position in the organizational hierarchy (Categ) is modestly influencing behaviors such that those lower in the hierarchy claim to be more likely to comply with desired behaviors (path coefficient = -.19, p = .000). This relationship may be due to the higher level of autonomy perceived by those at higher levels in the organization. This is a finding that warrants further investigation, as it is not quite clear why compliance would be greater at lower levels of the organization.

Correlations Among Controls

Discussion of correlations among controls and the exogenous variable Obj Part occurred earlier in this section. Relationship among the control variables themselves is of tangential interest in this study; however, understanding the dynamics between control variables can clarify potential impacts of these variables in the model and in practice. For example, the significant correlation between Tenure and Categ (.34, p = .000) may not be particularly surprising given that promotion to supervisor or manager is likely to be linked to length of service in the organization. However, what makes this correlation more interesting within the context of this model is that the impact of tenure on attitudes (Tenure → ATT = -.18, p = .002), albeit relatively modest, suggests that the longer employees have been at the organization the less positive their attitudes and those higher in the hierarchy are less likely to comply with the desired behaviors. It appears that the "leaders" in the organization, i.e., those with seniority or management status, may be less positive about the proposed change *and* less likely to comply with the new system themselves. This less than supportive orientation to the proposed change might "trickle down" the ranks and perhaps act to inhibit behavior change at lower levels.

Lack of significant relationships between Satisf and both Tenure and Categ suggests that there are other factors in the organization, unaccounted for in this model, linked to employee satisfaction. It is, in fact, a bit surprising that these relationships did not emerge, positive or negative. One might think that being a manager would lead to perceptions of satisfaction, but, as noted by Drummond

(1993), managers, especially middle managers, have their own pressures and conflicts in the workplace that may balance the supposedly positive impacts of increased power and autonomy. Similarly, length of service in the organization might imply a positive relationship satisfaction (e.g., "I'm so happy here that I've stayed forever.") or, under other circumstances, negative relationship ("I'm tired of this place, but I've been here so long I can't afford to leave."). Of course, speculation regarding these benign relationships is less valuable in understanding the model and more productive effort would be directed at identifying factors that do enhance (or detract from) work satisfaction, as it has a strong positive influence in the structural model.

Evidence of Mediation

A critical piece of this analysis and an important set of hypotheses for this study are the indirect or mediational effects evident in the causal chain. Specifically, we set out to establish that the path from Obj Part to BEH was largely, if not entirely, mediated by the intervening variables. Evidence for this indirect influence is in the following paragraphs, but first it may be helpful to review the concept of indirect effects or mediation within the context of SEM.

Indirect Effects and Testing for Mediation

An indirect effect is the result of mediating variables that "transmit" a portion of the effect of a prior variable on a subsequent one (Kline, 1998). The indirect effect is the product of the two direct effects (the one entering the mediating variable and the one leaving to the dependent variable); i.e., only part of the original effect "makes it thru" the mediating variable. Baron and Kenny's (1986) often cited

paper on mediation outlines the steps necessary to: 1) establish mediation, and 2) calculate significance of indirect effects. Assuming three latent variables, X1 (exogenous), Y1 (the proposed endogenous), and Y2 (the outcome endogenous variable), four conditions must be met to establish mediation: a) the zero-order correlation of X1 and Y2 is significant, thereby establishing a relationship that might be mediated; b) the direct effect of X1 on Y1 is significant; c) the direct effect of Y1 on Y2 is significant (controlling for any joint effects of X1); and d) the effect of X1 on Y2 controlling for Y1 is zero (complete mediation) or significantly reduced (partial mediation).

In a regression context, significance of the indirect effect is established via a formula including path coefficients and their respective standard errors. Per Newsom (2001), structural modeling simplifies the effort as it is, by nature, a simultaneous examination of these relationships, i.e., a direct effect X1→ Y2 can be included in a more complex model and, if it is not significant, but parameters for the X1→ Y1 and Y1→ Y2 effects are significant, then full, statistically significant mediation is supported.

These steps are straightforward for models in which only three variables are hypothesized to comprise the causal chain. In our "preferred" model, however, the causal chain is composed of a minimum of five variables (e.g., Obj Part → Subj Part (or Knowl) → PJ → ATT→ BEH; as noted later, one could redefine the causal chain to also include "Satisf," as it appears to indirectly influence multiple levels in the chain). In this situation, not only are there several "trios" of mediational effects similar to those described above, but more complicated patterns of multi-variable

mediation, e.g., the significance of mediation between Knowl and BEH via both PJ and ATT.

AMOS does not currently provide statistical testing of the specific indirect effects (Brown,1997) that can be identified in a multi-variable mediational chain.[3] In lieu of these tests, relevant trios of variables will be examined and the "rule of thumb" offered by Kline (1998) will be used to assess significance of the entire chain: for multi-variables (e.g., four or more in path), if all path coefficients are significant, the entire mediational chain is significant. The core hypotheses for this study refer primarily to patterns among latent trios and the entire chain. Examination of more involved paths will be the target of future analysis efforts via different software packages such as EQS.

Mediation in the "Preferred" Structural Model

The primary goal in developing a parsimonious model with "good fit" is to arrive at the stage where we can test the questions raised in the Introduction. At this point, reacquaintance with the relevant hypotheses may be helpful:

H1: ***Procedural justice perceptions will directly influence attitudes toward the proposed change, which will, in turn, mediate behavioral expectations specific to the organizational change.***

H2: ***Procedural justice perceptions will mediate the relationship between subjective participation and attitudes.***

[3] AMOS provides less than adequate statistical apparatus for significance testing of specific indirect or mediational effects. We are therefore left with examining parameter significance and trios modeled within the context of a "good" structural model. Attempts were made to model these relationships in EQS in order to leverage its more powerful tools associated with effects testing. Unfortunately, for reasons yet undetermined, we were unable to obtain a converged solution in this system. Future analysis plans include the diagnosis of this problem and clarification of specific effects via EQS.

H3: Subjective participation perceptions will mediate the relationship between objective participation and procedural justice.

Hypothesis One

Evidence for ***H1*** is found by examining the parameters associated with PJ, ATT, and BEH: all three direct paths are significant, e.g., PJ→ATT (.46, p = .000), ATT→BEH (.24, p = .003), and PJ → BEH (.39, p = .000), suggesting that there is partial, but not complete mediation of the relationship between procedural justice and behaviors around CPP. In fact, these results suggest that the direct effect of PJ is quite strong relative to the indirect effect via ATT. Indirect effects can be calculated as the product of the two direct effects (Kenny, 2001; Kline, 1998; Newsom, 2001); the indirect effect between PJ and BEH, therefore, equal .46* .24 or .11. Hypothesis One is only partially supported, then, as the direct effect between PJ and BEH remains statistically significant and, in fact, relatively large compared to the indirect pathway.

Hypothesis Two

Recall that subjective participation was originally conceptualized as four unique factors and subsequently distilled to two factors via development of the measurement model. As a result, there are two latents, one of which is referred to as Subj Part and incorporates elements of voice and influence and a second latent, Knowl, which includes indicators germane to employee understanding of the facts and circumstances of CPP. In the structural model, there is evidence of two different mediational mechanisms relevant to ***H2***. First, there is evidence of complete mediation between Subj Part and ATT, as the direct path between Subj

Parti and ATT dropped out of the model and we have remaining only the two highly significant paths leading into and out of PJ (e.g., Subj Part → PJ at .54 and PJ → ATT at .46). The indirect effect of Subj Part on ATT is .25, suggesting that this trio/pathway plays a substantial role in the relationship between participation opportunity and organizational outcomes.

The mediational effect of Knowl on ATT, however, is partial as the direct path from Knowl to ATT remains statistically significant (.22, p = .001) in the presence of two statistically significant paths leading into (.19, p = .000) and out of (.46, p = .000) PJ. The indirect effect of Knowl on ATT is .09 (.19* .46); this relatively small effect is largely due to a fairly modest relationship between Knowl and PJ; as noted above, PJ appears to be influenced much more strongly by perceptions of voice and influence (Subj Part), as opposed to knowledge of facts and circumstances. In this model then, we see evidence that knowledge plays a role in the formation of attitudes, but this is more due to a direct effect on ATT than due to influence via PJ.

Hypothesis Three

Hypothesis Three focuses on the relationship at the beginning of the chain: is the effect of participation behaviors (Obj Part) mediated via subjective interpretations of those experiences (Subj Part), or is there evidence to support a more direct relationship between participation "opportunity" and organizational outcomes? Not only is there no evidence of a direct effect from Obj Part to PJ (e.g., the direct path from Obj Part to PJ dropped out during development and testing of the structural models), there is no evidence that Obj Part plays a direct role at any

point in the causal chain. Within the context of the preferred model, there are no statistically significant direct paths leading from Obj Part to any other endogenous variable, except for the proximal subjective experience latents of Subj Part and Knowl. Simply providing the setting or vehicle for participation may not guarantee that desired organizational outcomes (in the form of more positive attitudes or behavioral compliance) will follow. Employee interpretation of the participation opportunity appears to be essential to subsequent outcomes.

Additional Mediational Path

Note that, while not hypothesized, worker satisfaction has a strong direct effect (.42, p = .000) on perceptions of influence and voice (Subj Part), which, in turn, substantially impact perceptions of procedural justice (.54, p = .000); i.e., the influence of satisfaction on fairness is mediated via subjective participation. In addition, there is a modest but significant direct effect of Satisf on PJ (.18), suggesting that this mediational effect is partial, not complete. These results imply that, in the context of a satisfied workforce, the participation opportunity may not be entirely necessary for subsequent perceptions and outcomes. That is, a satisfied employee appears to be more likely to report feelings of influence or voice, as well as be predisposed to perceptions of fairness or justice, thereby setting the stage for positive outcomes of organizational change.

Direct, Indirect and Total Effects

Total effects are the sum of all direct and indirect effects of one variable on another; specifically, "standardized total effects of one variable on another approximate the part of their observed correlation due to presumed causal relations"

(Kline, 1998, p. 122). Similar to other effect estimates, the total effect is also interpreted as path coefficient or beta weight, but will not appear as a parameter in the diagram unless the only effect involved in the relationship is a direct effect; i.e., the total effect is equal to the direct effect. Note that because the total effect is the sum of all indirect and direct effects, one can use this information to assess the relative proportion of the direct versus indirect effects of one variable on another.

Below is the effects decomposition table for the "preferred" structural model described above (Table 11). Total effects are presented in the top part of the table. As an example of how to use this output, note that the total effect of Categ on BEH is reported as -.19 (top section, bottom of far left column). This is the same coefficient as the direct effect parameter in the path diagram where Categ is found to have only a direct effect on BEH; there are no indirect paths connecting the two variables. Note that reflecting this modeled relationship, an entry of -.19 appears in the column under Categ in the Standardized Direct Effects portion of the table (middle section) and .00 appears in the Indirect Effects list (bottom section). This table confirms, then, that the only effect Categ, or position in the hierarchy, has on the outcome variable BEH is via the direct path modeled in the path diagram.

Table 11: Effect Decomposition Table for the "Preferred" Structural Model

Standardized Total Effects - Estimates

	Categ	Tenure	Satisf	Obj Part	Subj Part	Knowl	PJ	ATT
Subj Part	0.00	0.00	-0.42	-0.40	0.00	0.00	0.00	0.00
Knowl	0.00	0.00	0.00	-0.66	0.00	0.00	0.00	0.00
PJ	0.00	0.00	-0.41	-0.34	0.54	0.20	0.00	0.00
ATT	0.00	-0.18	-0.19	-0.30	0.25	0.31	0.46	0.00
BEH	-0.19	-0.04	-0.20	-0.20	0.27	0.15	0.50	0.24

Standardized Direct Effects - Estimates

	Categ	Tenure	Satisf	Obj Part	Subj Part	Knowl	PJ	ATT
Subj Part	0.00	0.00	-0.42	-0.40	0.00	0.00	0.00	0.00
Knowl	0.00	0.00	0.00	-0.66	0.00	0.00	0.00	0.00
PJ	0.00	0.00	-0.18	0.00	0.54	0.20	0.00	0.00
ATT	0.00	-0.18	0.00	0.00	0.00	0.22	0.46	0.00
BEH	-0.19	0.00	0.00	0.00	0.00	0.00	0.39	0.24

Standardized Indirect Effects - Estimates

	Categ	Tenure	Satisf	Obj Part	Subj Part	Knowl	PJ	ATT
Subj Part	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Knowl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PJ	0.00	0.00	-0.23	-0.34	0.00	0.00	0.00	0.00
ATT	0.00	0.00	-0.19	-0.30	0.25	0.09	0.00	0.00
BEH	0.00	-0.04	-0.20	-0.20	0.27	0.15	0.11	0.00

Going across the table and examining the remainder of the entries, we can see that Tenure has a total effect of -.18 on ATT and this is entirely due to the direct pathway modeled in the diagram (note that the path coefficient for the direct path from Tenure to ATT = -.18). In addition, however, there is also indication of a -.04 total effect of Tenure on BEH. This influence is due entirely to the indirect path of Tenure through ATT; i.e., a portion, albeit a small one, of the variance explained in BEH is due to the bit of Tenure that is transmitted through Attitudes (Indirect effect = product of two direct effects = -.18* .24 = .0432). This suggests that length of service has potential to influence outcomes at two points in the model: directly impacting attitudes and indirectly, but very slightly, influencing behaviors.

The effects associated with Satisf are more complex and demonstrate again the pervasive impact of this variable in the model. Total effects of Satisf are evident for every endogenous variable, except Knowl and effect sizes range from modest to

relatively large (-.19 to -.42). The large effect on Subj Part (-.42) is entirely due to the direct pathway described in the above section on parameter estimates. Satisf's total effect on PJ is also quite large (-.41), but composed of both direct and indirect effects. Recall that a direct effect of Satisf on PJ is explicitly modeled in the diagram as a control relationship (path coefficient = -.18); in addition, there is an indirect effect of Satisf on PJ via Subj Part (effect = -.23). Just over half of Satisf's effect on PJ, then, is due to its relationship via Subj Part (23/41 = 56%). Finally, we see that satisfaction in the workplace moderately, but indirectly, influences attitudes (indirect effect Satisf on ATT = -.19) and behaviors (indirect effect Satisf on BEH = -.20) around CPP via mediation through the causal chain.

Objective participation (Obj Part), the starting point in the proposed causal chain, exhibits substantial influence on all endogenous variables; however, the effects on PJ, ATT, and BEH (-.34, -.30, and -.20 respectively) are all indirect. We can conclude, then, that the opportunity to participate (Obj Part) appears to influence employee attitudes (ATT) and behaviors (BEH) regarding CPP. However, the influence on these outcomes is primarily due to how employees perceive the participatory experience (Subj Part), what they learn from the experience (Knowl), and how those perceptions ultimately influence perceptions of fairness (PJ). The inconsistent findings in the literature and limited associations in the workplace between participation and positive outcomes may be due to inattention (empirically and pragmatically) to these intervening assessments.

Subjective participation, as noted in the previous section on indirect effects, has a strong direct effect on PJ (.54) but no further direct effects in the model. That

is, while Subj Part exhibits modest influence on ATT and BEH (.25 and .27), these influences are entirely mediated by PJ. Knowl has a more modest impact on PJ (.20 – different from the path diagram figure of .19, assumably due to rounding algorithms), but continues to influence subsequent points in the model due a direct (.22) and indirect effect (.09) on ATT (.31 total effect) as well as a smaller indirect on BEH (.15). These findings support the inclusion of more subjective assessments of participation in models predicting the influence of organizational participation efforts on organizational outcomes. The degree to which employees perceive they have voice, influence and knowledge regarding CPP has substantial direct and indirect effects on attitudes and behaviors.

Perceptions of fairness or procedural justice (PJ) also have substantial impact on outcomes. As noted above, PJ serves as mediator through which other variables influence attitudes and behaviors. It also exerts its own influence on outcomes via a strong direct effect on ATT (.46) as well as direct (.39) and indirect (.11) effects on BEH (total effect = .50). If we look across the total effects per endogenous variable, PJ appears to have a relatively large impact on BEH and ATT as compared to other variables; e.g., total effect of Obj Part on ATT = -.30 and on BEH =.-.20, as compared to .46 and .50 respectively for PJ. These results are entirely consistent with most findings in the literature that claim that the perception of procedural justice, or fairness of processes, is an important antecedent to favorable organizational outcomes. This study also confirms the role of procedural justice as a potential mediator for other psychological influences such as knowledge and subjective participation.

Finally, while more straightforward, the table confirms the significant direct effect of attitudes on behaviors (.24). Again, it appears that efforts to improve attitudes of employees regarding organizational change may pay off in compliance with new behaviors (or, at least, intentions to comply with desired behaviors). For any organization, the bottom line is output: the above model is only an academic exercise if there is not some evidence that employee behaviors (i.e., productivity, creativity, effort) will be favorably impacted by participation "opportunities" and subsequent assessment of those opportunities relative to authenticity, knowledge and fairness.

Summary of Hypotheses

> "All models are wrong to some degree, even in the population, and the best one can hope for is to identify a parsimonious, substantively meaningful model that fits the observed data adequately well." (MacCallum & Austin, 2000, page number unavailable, online article)

Much of this Results section is devoted to deriving a model that approaches the hope outlined in the above statement. As noted often through this analysis, talking about the substance of the model, i.e., testing direct and indirect effects, examining specific parameters and paths, etc., is ill-advised if the global model does not adequately fit the data. The process of establishing a "good" model, however, requires attention to many details that are of only tangential substantive interest. At this point, as we segue to the Discussion of more general issues, it is necessary to

bring the focus back up to the larger questions raised in the Introduction: what do the analysis and results have to say specifically regarding the hypotheses laid out earlier in this dissertation?

Evidence supporting or not supporting the hypotheses emerged at different phases of model specification; therefore, it may be helpful to pull these findings together in one place as a way to close out this Results section. For now, we will primarily state the hypothesis and the evidence that emerged in the analysis along with initial thoughts as to the implications of these findings. More in depth discussion regarding these findings will be left for the Discussion.

Measurement Hypothesis: The Construct of Subjective Participation

This hypothesis is reviewed first, as its assessment occurs early in the analysis process and the outcome of this assessment impacts subsequent modeling steps.

H4: There are four independent psychological processes comprising Subjective Participation - not supported.

This hypothesis is examined during the measurement model phase of the analysis in which the four proposed latent factors, Influence, Voice, Status, and Knowledge, along with other latents, are submitted to both PCA and CFA to determine unidimensionality, construct validity and discriminant validity of the measurement model. Initial zero-order correlation patterns show evidence of high "between factor" item correlations for three of the proposed latents, and principal components output show all indicators of the Influence, Voice and Status constructs loading on one, and only one, factor. Indicators of the Knowledge construct did not

highly correlate with other items and loaded strongly on a second, distinct PCA factor.

As a result of the PCA findings, we reject the hypothesis that there are four factors representing "Subjective Participation" and move forward with only two latent factors. One factor retained several items from the original Voice, Status and Influence constructs (pared down to only Voice and Influence after the CFA phase) and retains the label "Subjective Participation." The other remaining latent reflects the original Knowledge indicators and continues to be referred to as the Knowledge latent variable.

Mediational Hypotheses: Subjective Participation, Knowledge, Procedural Justice and Attitude

Three hypotheses were offered relative to mediational pathways in the model. Evidence supporting or not supporting these hypotheses emerged during the structural model comparison process, as the unconstrained (ultimately "preferred") model was tested against the revised theoretical model. In this process, direct paths were explicitly modeled and tested for significance. If the direct path was not statistically significant, but paths into and out of the mediational variable were significant, evidence for complete mediation is provided. If the direct path remains statistically significant (along with paths into and out of the mediational latent), evidence for partial mediation is provided. In this latter situation, the relative impact of the indirect or mediational path as compared to the direct path could be examined via an effects decomposition table.

H1: Procedural justice perceptions will directly influence attitudes toward the proposed change, which will, in turn, mediate behavioral expectations specific to the organizational change – partially supported.

Here we have evidence of partial mediation as the direct path from Procedural Justice to Behaviors remained statistically significant and quite strong (standardized path coefficient = .39, p = .000). The indirect effect via Attitudes was estimated to be .11, thereby suggesting that the direct effect of Procedural Justice on anticipated compliance with desired Behaviors is roughly three times stronger than its effect mediated through Attitudes. This is consistent with the relatively strong linkage observed in the literature (Greenberg, 2001; Konovsky, 2000; Robbins, et al., 2000) between procedural justice perceptions and both attitudes and performance (as opposed to the unreliable linkage seen between participation and performance, as discussed later).

The direct, albeit modest, link between Attitudes and Behavior (.24, p = .003) suggests that efforts to improve employee attitudes regarding organizational change may translate to improved organizational outcomes, as employees are more willing to comply with desired behaviors. As noted earlier, because behaviors in the work setting are multiply determined, often by factors outside the control of the employee as well as the company, it may be more reasonable to assess the willingness or inclination toward desired behaviors. That is, as suggested by Taylor, et al. (1995), the impact of attitudes on motivations to engage in desired behaviors may be the managerially and psychologically important issue in moving the organization toward a new culture or operating system. The relatively strong direct

effect of Procedural Justice on Behaviors, however, indicates that perceptions of fairness may be the critical factor in motivating the desired behaviors. These results suggest that if procedures are perceived to be fair, behavioral compliance may follow, even if attitudes toward the general concept of the proposed change are not highly favorable.

H2: Procedural justice perceptions will mediate the relationship between subjective participation and attitudes – partially supported.

Hypothesis Two is supported in that mediation occurs for both latents representing the subjective experience of employees, but it is apparent that the influence of Knowledge and Subjective Participation on Attitudes are not substantively equivalent. That is, *the influence of Subjective Participation on Attitudes is completely mediated via Procedural Justice* (i.e., the direct path from Subjective Participation to Attitudes drops out of the model as statistically insignificant), but Knowledge has dual influence on Attitudes via a small indirect effect through PJ (.09), as well as its own significant and modest direct effect (.22) on Attitudes. That is, *the influence of Knowledge on Attitudes is partially mediated via Procedural Justice*. Relative to Subjective Participation, Knowledge has a weaker (yet significant) relationship to Procedural Justice (standardized path coefficient = .19 compared to .54 for Subjective Participation). Subjective Participation's influence on outcomes is entirely mediated by its strong relationship with Procedural Justice, whereas the influence of Knowledge on outcomes (specifically Attitudes toward CPP) appears to be more direct.

These findings are consistent with those of Roberson, et al. (1999) and support their claim that the construct of procedural justice is an important mediator in explaining the relationship between participation and organizational outcomes. We have extended their findings, however, and observed that the mediational role of Procedural Justice is somewhat dependent on antecedent psychological factors; i.e., if participation only enhances knowledge, then the mediational role of procedural justice may be less influential than if participation is interpreted as meaningful by employees (i.e, subjective participation in the form of influence or voice).

H3: Subjective participation perceptions will mediate the relationship between objective participation and procedural justice – supported.

The strong relationship between Objective Participation and the proximal latents of Subjective Participation and Knowledge (-.40 and -.66 respectively, negatives due to coding of Objective Participation), combined with the significance and modest or large effect size of subsequent paths from Subjective Participation and Knowledge to other factors in the causal chain, as well as the lack of any other direct effects from Objective Participation to other endogenous factors supports Hypothesis Three. More so, the preferred model provides evidence to support the overarching hypothesis that the effects of participation "opportunities" on organizational outcomes are entirely mediated through these more subjective, psychological assessments of the meaningfulness of the participatory experience. That is, the inconsistent and small associations noted in practice and in the literature between overt participation and organizational outcomes may be due to lack of awareness and accounting for important mediating psychological factors.

Control Hypotheses: Tenure, Category and Satisfaction

Three hypotheses regarding control factors were advanced in the Introduction; evidence for these hypotheses emerged as we developed the "revised" theoretical model. The revised model was, in fact, necessary, as several of the initially hypothesized control relationships were quickly identified as insignificant. The final "preferred" model tested the above mediational hypotheses within a context of these more appropriately specified controls, as opposed to the originally hypothesized relationships.

H5a: Tenure or length of service will impact attitudes of organizational change over and above participation; however, participation and procedural justice effects will still be evident over and above tenure- supported.

H5b: Position in the hierarchy (Category) will impact perceptions of subjective participation over and above objective participation; however, participation effects will still be evident over and above hierarchy levels – not supported.

H5c: Overall satisfaction will impact attitudes of the organizational change over and above participation; however, participation and procedural justice effects will still be evident over and above satisfaction – not supported.

Only Hypothesis 5a was supported in that the path from Tenure to Attitudes was the only hypothesized direct control path that remained statistically significant throughout the modeling effort (standardized coefficient = -.18). The relationship suggests that length of service is inversely related to attitudes about CPP; that is, the longer employees have been in State Government, the less positive their attitudes

about CPP over and above other perceptions or evaluations of justice or participation.

The path coefficient from Category to Subjective Participation was statistically insignificant, therefore leading to rejection of Hypothesis 5b. It was found, in fact, that the path from Category to Behaviors (end point in the causal chain) was statistically significant, albeit modest in size (-.19). This relationship suggests that, rather than impacting perceptions of influence or voice, position in the hierarchy or Category more directly influences outcome behaviors such that the individuals in the lower levels of the hierarchy are more likely to comply with desired behaviors over and above their perceptions of participation, fairness or attitudes about the proposed change.

Finally, the path coefficient between Satisfaction and Attitudes was not statistically significant, therefore, we did not obtain support for Hypothesis 5c. However, this hypothesis underestimated the role of Satisfaction in the model in that satisfaction in the workplace was found to be strongly and directly associated with perceptions of subjective participation (path coefficient = -.42, negative due to coding of Satisfaction) as well as, more modestly, perceptions of procedural justice (-.18). These findings suggest that overall work satisfaction needs to play a more prominent role in both academic investigations and pragmatic applications of participation programs. A context of satisfied workers seems to go a long way in creating the positive attitudes and outcomes desired by management, over and above the impacts of participation opportunities.

Covariance Among Exogenous Variables

Two hypotheses were offered relative to relationships between exogenous factors. These are not central to the dissertation, but do provide additional insight into the dynamics of the overall causal model. Evidence in support of these hypotheses emerged as the revised theoretical model was specified (i.e., prior to testing direct pathways in the "unconstrained" alternative model). We will spend a bit more time here discussing the implications of these relationships, as the Discussion will focus primarily on the "big" issues of the causal chain and subjective participation.

H6a: Overall satisfaction will be correlated with objective participation – supported.

H6b: Overall satisfaction will be correlated with position in the hierarchy – not supported.

The correlation coefficient between Satisfaction and Objective Participation was statistically significant (.25, p = .003), thereby supporting H6a and suggesting that more satisfied workers are more likely to engage in participatory behaviors. This finding adds further support to the importance of including measures of worker satisfaction in assessments of impacts of participation: if the more satisfied workers are volunteering to be involved in organizational change efforts, it is less surprising that those who have participated are more positive regarding the proposed change or more likely to comply with requested behaviors.

The correlation between Satisfaction and Category (position in the hierarchy) was not significant, therefore leading us to reject the hypothesis that the

"upper echelon" is more content or satisfied with their work situation. This finding supports Drummond's (1993) assertion that there is a bit of a myth around the "happy manager." Middle managers in particular (which is more descriptive of managers in this sample) bear the burden of being "boundary spanner" between workers and senior management. They must implement the sometimes unrealistic directives of a top management group that may be quite out of touch with the day-to-day realities of the workplace. They most directly feel the tension of aggressive organizational goals and limited resources, including the sometimes limited enthusiasm of the rank-and-file employee.

While not hypothesized, it is not surprising that the correlation between Tenure and Category is statistically significant (.34, p = .000): management status is typically attained after several years of employment. Based on the relationships between Tenure and Attitudes (-.18) and Category and Behavior (-.19) described above, this correlation suggests a "double whammy" on organizational outcomes: those with the longest tenure and higher positions in the organization, i.e., the "leaders" in the group, may be the least positive about organizational change over and above participation, perceptions of influence or perceptions of fairness.

The unanticipated correlation between Category and Objective Participation (-.25 – recall that lower values for Obj Part indicate higher levels of participation) suggests that higher levels of workers are engaged in participatory efforts. In the context of relationships noted in the preceding paragraph, this correlation may also suggest that those who are predisposed to be a bit negative (i.e., managers with substantial length of service) are the ones "driving" the change in the organization.

That is, while we noted above that more satisfied workers tend to participate, the "higher ups" that are involved in the process may dampen the enthusiasm of other more positive employees.

The ultimate failure of the program may be attributed, perhaps in part, to a self-fulfilling prophecy: an "I knew it wouldn't work" mindset coming into the planning process. While most of the individuals on the Design Team and Task Forces were overtly positive in the meetings, the less guarded "water cooler" conversations suggested that several were not as supportive of the change as their "meeting self," claimed Sikora (1999). When questioned as to the "real" impact of CPP in the next five years, most participants reported that they ultimately didn't expect much to change, despite their claims in meetings that "this was the biggest thing to ever hit State Government." This type of ambivalence is unlikely to serve as the basis for "rallying the troops" around organizational change.

CHAPTER 4: DISCUSSION

The purpose of this study is to more carefully examine the apparent lack of connection between employee participation and organizational outcomes. The weak association between two constructs that should be so tightly connected is baffling to academics and frustrating to managers. In fact, the stimulus for this study was the relatively low ratings on attitudes and anticipated behaviors regarding CPP despite a fairly aggressive "push" by senior management for employee involvement and participation in the process of change.

On the surface, results of this research appear to confirm claims (Glew, et al., 1995; Roberson, et al., 1999; Wagner, 1994) that there is little, if any, evidence of a direct relationship between participation and organizational outcomes. That is, within the context of the preferred model, we did not find statistically significant direct effects between measures of participation behaviors (Objective Participation) and attitudes or behaviors regarding CPP. If we had paralleled the simple "if-then" frameworks offered in many studies, our story might end here: just one more study unable to establish a direct link between participation and outcomes. However, because the scope of study extended beyond overt behaviors and the immediate participatory event, we are able to refute the claim that there is no firm link between participation and organizational outcomes: the link is there, but additional links are required to understand the chain. A more complex model is needed to account for a more complex relationship than that reflected in a simple "if people participate, then they will be happy" formula.

Simply put, there is compelling evidence of mediation throughout the proposed model of organizational participation. Two psychological constructs of procedural justice and subjective participation appear to mediate between the relationship between overt participatory behaviors and subsequent attitudes and anticipated behaviors around CPP. The mediational role of procedural justice both replicates and extends work by Roberson, et al. (1999). Similar to their findings, procedural justice mediated relationships from participation to attitudes, but because our definition of participation was expanded to include both subjective and objective aspects, the mediational relationship is clarified. Results of this study suggest that mediation through procedural justice occurs less for overt behaviors (i.e., there were no direct links between Objective Participation and Procedural Justice) and is more a function of subjective evaluations of what the participation behaviors mean to the employee.

Subjective Participation as a New Variable

These subjective evaluations were initially conceptualized as four possible factors bridging the relationship between overt participation and procedural justice: 1) perceptions of *Influence* as suggested by the process control literature (Thibaut & Walker, 1975; Magner, et al., 1996); 2) perceptions of *Voice* as a normative ideal or value in democratic society (De Toqueville, 1835/1956; Folger, 1977; Pasmore & Fagen, 1992); 3) perceptions of *Status* associated with treatment consistent with "in-group" membership (Tyler & Lind, 1988; Tyler, 1989; Tyler & Smith, 1999); and 4) increased *Knowledge* and understanding of organizational, task and role demands

(Coch & French, 1948; Lewin, 1948, 1951; Locke, et al., 1988). These factors are often discussed in both participation and procedural justice literatures as fairly distinct theoretical constructs. Our empirical findings suggest, however, that in organizational settings these theoretical distinctions may dissolve. As the measurement model was developed, three of the four factors, Influence, Voice and Status, collapsed into a single factor; i.e., there was no evidence at all of three distinct constructs. Knowledge, however, remained in the model as a distinct latent variable.

The separation of Influence, Voice and Status in the literature may be helpful at a conceptual level, but at least in this sample, it is not clear that separation among these constructs is warranted in applied settings. For these employees, the opportunity to offer one's opinion, impact decisions, and feel "part of" or valued by the decision-making body appear to be intertwined. Feelings of trust or belonging are perhaps a necessary prerequisite to feeling that one can safely voice one's opinion without reprisal; similarly, if one does not feel valued or does not feel that an opinion is "safe," it is unlikely that a sense of influence will follow. Instead of theoretical work that looks to create further distinctions among these factors, perhaps it is useful to look at ways in which these constructs interact or relate to one another. Is sense of influence the "end goal"? If so, how do perceptions of voice and status create a sense of genuine influence over outcomes? If building a sense of "team" is important (i.e., "we're all in this together" or a "we" identity), how do voice and influence help support that perception?

Rather than using the concepts of instrumental and non-instrumental functions of voice (Lind, Kanfer, & Early, 1990) to further dissect theory around procedural justice or participation, these concepts may be very useful in integrating rather than dividing this theoretical arena. Lind, et al., (1990) suggest that voice can be extrinsically or instrumentally valued when the expression of opinion appears to result in indirect control or *influence* over outcomes. They further suggest that voice can serve a normative function, i.e., be valued for non-instrumental reasons, as it reflects one's *status* as a group member. They do not include the normative value of voice as an expression of a democratic or social ideal, but one could certainly posit this to be an additional non-instrumental function of voice. This latter function appears to be the most extreme non-instrumental role, in fact, as we earlier suggested that the expression of voice is valued as an end unto itself; i.e. as an expression of the normative/cultural ideal of democracy. Perhaps these functions of voice can be thought of less as discrete categories and more as a continuum from highly instrumental (means to my material ends), somewhat instrumental (means to social ends but also symbolic of my membership in "we"), to highly non-instrumental (expression of normative ideal).

Alternatively, it may be helpful to think of these factors as a system of relationships, i.e., a process-orientation versus a taxonomic analysis. Voice as an instrumental concept might be construed as an antecedent to influence: i.e., does expression of opinion consistently result in perception of influence? Is voice necessary? Is it sufficient? In the non-instrumental case, voice could be construed as a consequence of perceptions of status: I feel like an "in-group" member,

therefore I feel comfortable in voicing my true opinion. Of course, one could give the appearance of "voicing" to establish one's status as an in-group member, but the voice may be that of the in-group, not one's own (Sikora, 2001). Further, the expression of voice could be viewed as a consequence of the perception that that workplace is, indeed, a democracy, not a dictatorship; i.e., a measure of workplace democracy could be the degree to which workers offer opinions or ideas. One needs to be aware, however, that employees are likely to "voice on demand" if directed to by management. Again, voice may not reflect the true beliefs and opinions of employees, but may instead be dutiful parroting of preferred corporate slogans or messages.

For purposes of this study, we simply collapsed the three factors into one and moved on with the larger analysis; questions regarding the nature of "subjective participation" and dynamics among its components must be left for future research. Given the powerful linkage between Subjective Participation and Procedural Justice (.54) and mediational role played by Subjective Participation in the larger model, it is clear that future research on this construct would benefit theoretical as well as pragmatic efforts in organizational participation. That is, if participation is simply defined as a behavior such as "showing up to meetings," then the mediational role of procedural justice is likely to be weak or non-existent and desired organizational outcomes may or may not follow. Perhaps the most important implication of this study, in fact, is the importance of separating overt behavior from subjective interpretation: it is the employees' perception of the behavior or experience, not the participatory "opportunity" itself, that seems to matter most in subsequent outcomes.

Differential Pathways to Outcomes

Another major finding in this study is evidence of a differential pathway of participation as it is mediated through knowledge versus subjective participation. Interestingly, the mediational role of fairness or justice may be less influential if the primary psychological impact of participatory behaviors is increased knowledge. That is, unlike perceptions of voice and influence, which appear to have their influence primarily channeled via perceptions of procedural justice, employee knowledge as a result of participation has a modest, but significant, direct effect on attitudes regarding CPP and only a weak indirect effect via procedural justice. It appears that those who are more involved (i.e., have higher levels of Objective Participation) report higher levels of knowledge or understanding of the why's, what's and how's of CPP and this knowledge is directly, albeit modestly, linked to more positive attitudes about the proposed change. This finding suggests an informational influence of participation on attitudes somewhat independent of perceptions of subjective participation and justice.

There may, therefore, be two related, but substantively distinct, pathways from participation to outcomes: one that is more cognitive in nature via increased knowledge of facts and circumstances of the pending change and one that is more motivational in the form of perceptions of influence, voice and fairness. Or, perhaps the attitude change literature can be used to better understand these two paths: knowledge could be viewed as an example of informational influence (Deutsch & Gerard, 1955; Sherif, 1936) on attitudes regarding CPP; i.e., information shared during participatory events adds clarity and meaning to an often ambiguous

workplace. The information provided in these meetings would likely present more positive than negative insights into the pending change (assuming the information is authored by management or change agents); therefore, the information used by the employee to evaluate "what's going on" would lead to more positive attitudes about the organizational change.

This information function parallels the "sensegiving" role of management as described by Weick (1995) as opposed to the "sensemaking" function that "bottom-up" involvement is supposed to engender in the workplace. Meaning in this context is supplied by the authors of the program and participation is primarily a vehicle by which to provide (critical theorists might say impose) meaning to employees. Often participation is used as a mechanism to gain "buy-in" from employees as opposed to obtaining their unique point-of-view regarding the proposed change or program. This study suggests that information sharing can engender positive attitudes and compliance, but that more can be gained from providing employees an opportunity to feel truly involved or influential in the change process. In fact, as learned recently by Enron, the provision of meaning that is not in the best interests of employees can backfire in the most painful ways. At a minimum, employees need to be more actively involved in the interpretation of information, not simply "fed" information to gain their compliance.

Subjective participation, on the other hand, could be viewed as a form of normative influence (Asch, 1951, 1956; Deutsch & Gerard, 1955). This normative influence is more subtle than conforming simply because others do so or say so (although if Status was more integrated into the Subjective Participation measure,

normative influence in its more traditional sense would be strongly supported). Normative influence may occur here primarily due to the larger social context or culture supporting certain norms of behavior. That is, if the overt culture of the organization is participatory or democratic and one behaves in a democratic way, the outcomes should be viewed more favorably. That is, everyone has "followed the rules" of a democratic society, therefore the outcomes are more positive. The influential role of perceptions of fairness or justice as mediators between subjective participation and attitudes is entirely consistent with this normative "play by the rules" framework.

This study only suggests the possible existence of two complementary, but distinct, pathways from Objective Participation to subsequent Attitudes and Behaviors; further theoretical and empirical work on the nature and reliability of each path, as well as the dynamics between the paths, is clearly needed. From a practical standpoint, these results suggest that if both paths are leveraged, i.e., if participation programs are viewed as opportunities for real influence and voice, as well as vehicles for increasing knowledge around a proposed change, a manager might expect substantial positive impact on attitudes and behavioral compliance with desired behaviors. If only one path is stimulated, however, i.e., participation programs only provide information or simply provide "warm fuzzies" without needed information about the program, we would still anticipate positive impacts on attitudes and behaviors, but less so than if both pathways were utilized. Finally, if the participation programs are viewed as a "sham," i.e., no real influence and no

useful information, it is unlikely that employee attitudes and behaviors would improve around the proposed change.

Importance of Context

Up to now, this Discussion has focused on the causal chain itself. Another important finding in this study is that the causal chain, or link between participation to outcomes, needs to be complicated not simply from within the chain, but from the outside as well. That is, participation and organizational change do not occur in a vacuum, but are likely to be impacted by larger, contextual factors. Based on this study, a critical organizational factor appears to be overall level of worker satisfaction in the workplace. Over and above the participatory experience, perceptions of influence, knowledge about CPP, or perceptions of fairness of CPP processes, general employee satisfaction appears to play a significant role in setting the stage for positive (or negative) attitudes and desired behavior. Satisfaction is not only correlated with participatory behaviors (Objective Participation), but has significant direct effects on perceptions of subjective participation and direct and indirect effects on procedural justice. In general, the more satisfied the employee, the more likely they are to participate, the more likely they are to perceive that they have influence or voice, and the more likely they are to perceive that processes and procedures are fair. All these effects eventually cascade down to more positive attitudes toward CPP, as well as increased likelihood to comply with desired behaviors.

Given its substantial impacts on key variables early in the pathway, Satisfaction, more than being "just" a context or potential control variable, could be construed as part of the causal chain itself. The path to positive outcomes is, it seems, only partially dependent on participation opportunities (Objective Participation). In fact, the strong relationship of satisfaction to subjective participation and procedural justice suggests that participation programs may not even be necessary within a context of a highly satisfied workforce. Satisfied employees may be highly predisposed toward perceptions of voice, influence and fairness (and subsequent positive attitudes and behaviors toward organizational change) without the formality of an "official" participation program. Similarly, it appears that if the workforce is dissatisfied, participation programs may be relatively benign; in effect, the potential positives of participation are canceled out by the concerns and suspicions of a dissatisfied workforce. While one can claim, based on the above discussion, that participation "opportunities" open the door for subsequent evaluations of fairness and positive outcomes, within the context of a satisfied workforce, the door appears to open even wider and conversely, within the context of dissatisfied employees, the door may be only partially ajar or closed entirely.

Further contextual effects are evident in relationships between position in the hierarchy (Category) and length of service in the organization. These controls primarily influenced the model at the end of the chain (i.e., are less appropriately construed as part of the chain itself) with position in the hierarchy directly impacting anticipated behaviors and length of service influencing attitudes toward CPP. Again, while these relationships are not central to the purpose of this study, it is

important to note, if only from a practical perspective, that participation efforts may have differential impacts depending on the type of employee involved. In this situation, it appears that employees higher in the organization were less inclined to adopt desired behaviors and those with more years of experience had less positive attitudes toward the proposed change. As we did not test the moderating effects of these factors, these are only preliminary conclusions – a future study in which group differences are explicitly tested would offer more conclusive evidence of the impact of these control factors.

Participation may or may not impact these predispositions toward the proposed change. In fact, participation, if viewed as inauthentic, can solidify these perceptions, as it simply confirms the beliefs of the employees that this is "just one more way for management to tick off employees and reduce costs." If motives are suspect to begin with, an inauthentic participation process will entirely undermine change efforts. Authentic participation efforts may or may not counterbalance a legacy of distrust or cynicism, but can be a positive step in building better relationships with employees.

Contributions to Theory

This study contributes to the psychology and organizational literature in several ways. First, the demarcation of the four possible pathways bridging participation and procedural justice offers a means to integrate the two literatures. Discussions of voice, influence, status and knowledge abound in both literatures, but to-date, management theory regarding participation remains largely isolated from

psychological theories of procedural justice. Integration of these concepts appears to be beneficial in understanding organizational dynamics. In addition, the review of the subjective participation factors suggests that the literature looks for ways to integrate, rather than separate, concepts of voice, influence and status. The typical approach is to continue to delineate finer and finer categories of "types" or "functions" of procedural justice. These results suggest that such distinctions maintain a disjointed rather than holistic view of employee perceptions. In effect, the puzzle pieces for understanding a single puzzle of employee participation, influence, status and fairness are continually sorted into smaller, separate boxes; perhaps joining the pieces and discarding the boxes is a more productive strategy for understanding the complex dynamics of employee attitudes and behaviors.

The concept of "subjective" versus "objective" participation is, apparently, an important one and not often discussed in the management literature. Employees (and study respondents) are often assumed to share the same interpretation of events as managers and academic investigators: employees attended the task force meetings so, of course, they feel like they participated, so why in the world aren't they happy? This study suggests that objective behavior is not the same as subjective reality from the employee point of view. Employees are very adept at "going through the motions" (Hochschild, 1983; Kunda, 1992) to display the appropriate demeanor and behaviors that reap rewards (or at least avoid punishment). The fundamental question in participation research, then, is: is it "real" or are employees simply going through the motions? The inconsistent or weak relationships between participation and outcomes may be due, in part, to

academics unwittingly privileging the view of management and discounting the view of employees.

The role of context is also underemphasized, particularly in the psychological literature. The view of employees (or participants) as being "blank slates" dominates research in both experimental and non-experimental domains. It is as if the proposed change or new program exists in isolation from the day-to-day experience and work history of the employee. The significant effects of control variables, e.g., overall worker satisfaction, length of service and place in the hierarchy, suggest that looking at participation in isolation masks the influence that organizational context and worker history may have on outcomes. While an employee may show more positive attitudes within the context of a hypothetical experimental study, the same employee may not report positive attitudes within the context of their everyday work situation.

For example, in the focus groups preceding the survey, we did tend to hear more cynicism and doubt coming from long-term employees than from newer hires. In an in-depth interview later in the planning process, one task force member, a supervisor with over 10 years of experience in State government, likened organizational change to "tornado drills:" "everyone hides in their offices until the 'program of the year' blows through the office and things just go back to where they were before" (Sikora, 1999). If the organization has a history of failed attempts at change, or if, as one employee put it "employees always lose," we would expect tenure to be negatively related to attitudes about almost any proposed change. Conversely, if the organization has successfully implemented changes, we might see

more positive direct paths to attitudes and behaviors. Context does matter if we ultimately want to subject our theories to the acid test of "real world" application.

Finally, this study suggests that looking at "traditional" variables in new ways can help clarify puzzling relationships. For example, employee satisfaction is almost always used as a dependent or outcome variable in studies regarding participation or procedural justice (Robbins, et al., 2000). While one can visualize many scenarios where satisfaction levels are a meaningful outcome of participation or fairness interventions, it is also effectively conceptualized as an antecedent to these very perceptions. This speaks again to the usefulness of thinking about the context of our studies or interventions: respondents come into these events with a history and set of a priori beliefs and attitudes (albeit perhaps only loosely formed). These beliefs and attitudes are themselves a result of previous experiences and exposures to information (i.e., an outcome or dependent variable in some other context) that now become antecedent to the next set of experiences (Glew, 1995; Robbins, et al., 2000).

Our studies often assume linear relationships in which our interventions or designs are viewed as a distinct, isolated starting point in the lives of our respondents – perhaps a better conceptualization is circular or spiral in which our interventions or inquiries are merely part of a larger, longer, social psychological journey. Isolating individual experiences in this journey is important for deeply analyzing their features and functions, but simultaneously robs them of some of the qualities that make them dynamic and whole. Hopefully, this study offers a broader

view of employee experience and identifies new ways in which to think about the relationships between participation, justice, attitudes and behaviors.

Limitations

There are, of course, limitations to any research endeavor and some of the strengths of this study become, simultaneously, the source of its weaknesses. First, while attempts were made to generate plausible alternative models and avoid confirmation bias, it is always the case that other, equivalent models exist that might better explain the covariation in this data and, more largely, offer better insights into the dynamics of participation and organizational outcomes. In order to focus the study, a theoretical model was proposed and used to frame most of the analysis. The analysis appears to support this model, or at least a variation of it, reasonably well; however, there is no claim here that this is the "best" or "true" model.

The measures used are based largely on focus group work predating the survey. This appears to strengthen the validity and interpretability of the findings. That is, because so many of the measures reflect: a) important issues from the point of view of the employee, and b) are phrased in their words, the model may fit the data reasonably well simply because it fundamentally captures the meaning systems of the participants. However, as a result of this "bottom-up" questionnaire design, as well as mandates by the sponsors to keep the data "useful," the limitations of the measures are several fold: 1) findings are less generalizable because the measures may be too locally specific; 2) scales in some of the key measures (Objective Participation, Satisfaction) are very truncated, reducing variation in the analysis; 3)

most measures are ordinal, thereby potentially violating assumptions of a maximum likelihood statistical tool; and 4) measures were designed primarily to meet the needs of the sponsoring organization, therefore their suitability (or lack thereof) as measures of theoretical constructs such as fairness or voice may increase error in the model. Clearly, additional work is required to create more generalizable factors with better measurement properties while simultaneously maintaining the orientation toward employee meaning systems.

In addition to the limited generalizability of the measures, there are additional limits associated with a single, cross-sectional study. Per MacCallum and Austin (2000), these limits include limits of sample (who is being studied), limits of variables (what indicators are or, importantly are not, included), and limits of time (what is occasion or context of measurement). The findings and implications of this study would be strengthened by replication in other contexts (e.g., a for-profit organization, entrepreneurial start-up, high tech, industrial, etc.) with other events (changes that are not as directly associated with compensation, mergers, etc.), using more generic measures with better measurement properties. The data also presents a potential problem with error due to common method variance. That is, all data is based on a single, self-report data collection process and relationships among latent factors could be an artifact of this systematic error. The SEM/CFA approach is helpful in explicating potential sources of error, but we cannot be entirely sure that the results are not reflective of the model without using a more rigorous measurement approach such as a multi-trait/multi-method matrix (Kenny & Kashy, 1992; Judd & McClelland, 1998).

Finally, longitudinal studies would enhance our understanding of the role of context and the dynamics of the "causal chain." The notion of true causality or "causal chain" is not appropriate within a cross-sectional design (MacCallum & Austin, 2000), and in this study we can only make claims of apparent association, not true causality.

Future Research

This dissertation raises perhaps more issues than it resolves. Apart from need to replicate the findings across other samples and contexts, other more substantive questions were generated from this work. First, what is the nature of "subjective participation"? Is the construct best thought of as "influence" or is there a qualitatively distinct construct that needs to be conceptualized and tested to capture the interpretations of participation events by employees? In what way(s) do influence, voice and status combine to generate perceptions of justice or fairness? The mediational variables used in this study need to be dissected in terms of content as well as process or functional features. This would likely require qualitative work specifically targeted at the responses of employees to participation activities, measurement studies to establish reliability and validity of a coherent measure (or set of measures), and experimental work to better understand the conditions under which specific interpretations emerge and are applied to subsequent impressions of fairness.

The differential paths through knowledge and subjective participation also need to be confirmed and clarified. Are different types of participation activities

associated with a "knowledge" versus a "subjective participation" path? Are there types of attitudes or behaviors that are more or less impacted by an informational versus normative approach to organizational change? What is the nature of the shared unaccounted for variance between these factors? Are the paths better thought of as independent or is there some unifying construct that can account for their mutual influence on attitudes? The role of satisfaction in this causal chain was a bit of a surprise and also needs to be further explicated. Why does this primarily affect attitudes via subjective participation and procedural justice and not via knowledge?

Finally, studies that allow us to compare groups within the organization would clarify the role of some of the exogenous variables. For example, a study in which comparisons are made across managers versus clerical staff or, more relevant to the participation focus, a comparison between those who overtly participated in the organizational change and those who did not. Theoretically these comparisons were possible in this study, but sample size was already stretched given the complexity of the model and we could not subdivide further into subgroups without undermining the stability of the models.

In general, the findings from this broad model suggest a series of more specific questions regarding its components. It appears that the global framework is potentially helpful in understanding and identifying where the disconnects between participation and outcomes may be occurring. Next steps will emphasize replication and refinement of the global model along with a deeper understanding of the nature and dynamics within and among its component parts.

CHAPTER 5: CONCLUSION

"Authentic: being what it purports to be, genuine, true" Websters (1979)

This research offers new insight into the role of participation and procedural justice in a context of organizational change. The vast majority, if not all, studies of participation as well as procedural justice appear to be "post-hoc" or looking at perceptions and attitudes after the fact. This study provides insight into the early phases of organizational change: how do experiences and evaluations of the participation process contemporaneously impact expectations and intentions around compliance with desired new behaviors? The authors and architects of the new compensation system envisioned, at least on paper, a new culture for State government that hinged on highly engaged, intrinsically motivated, private-sector-like employees (Sikora, 1998, 1999, 2000). Colorado Peak Performance (CPP) was hailed as the catalyst for the behaviors and attitudes that were desired by management in this "new era in State government." Participation by employees was an explicit strategy used by senior management to fuel the fire of change.

In the desire to stimulate new behaviors, however, there may have been a fundamental oversight in the implementation of the participatory process: inattention to the employee's interpretation of "what's going on around here." This study suggests that if "what's going on around here" is interpreted as authentic participation, it is likely that management will succeed in transforming the organization. If, however, employees view the participatory process as not meaningful or truly informative, the efforts invested in teams, communication plans,

and planning sessions may be for naught. The outcomes of change may be at risk before the change is even implemented.

In the CPP context, numerous "opportunities" to participate were provided and active involvement of employees was overtly encouraged. Despite the availability of these opportunities, however, perceptions of fairness, attitudes toward the proposed change, and expectations regarding future behaviors were somewhat negative (as summarized in Tables 2 and 3, Descriptive Summaries of Measures). Based on subsequent ethnographic and qualitative research in this department, perceptions of subjective participation or psychological meaningfulness of these opportunities appeared to deteriorate over time. As reported elsewhere (Sikora, 2000), team members' decisions and recommendations were consistently overriden or "guided" by the desires of senior management. By the end of the planning process, most team and task force members were eager to disengage from the participation "opportunities" rather than remain engaged in the change process. One team member expressed the widening gap between overt process and authentic involvement quite well:

> Actually what [my perspective was when I started the process] was that this was a paradigm shift from regular State government. It was basically a monumental change in the way State government functioned. How it thinks, how it holds itself accountable to the taxpayers, all of those ideological kind of things.... What it is now? As one division director said, let's just put the steps in place they want in place and move on. I mean let's just dot our i's and cross our t's and it's the same old process and move on. You know, let's just give them on paper what they want and go for it... I think there will not be any new depth or employee planning processes because they don't want to build that into the system either. So I think we're just going to have status quo. We're just going to put a new label on it and call it CPP. (Sikora, 1999)

Fundamentally, management needs to think not only about "opportunities" they create for participation, but about the reality that exists in the minds of their employees. The above model holds great promise for participation programs as it implies that these programs can, indeed, stimulate positive attitudes and behaviors. However, the model simultaneously suggests that participation programs that are shallow or placed within a context of dissatisfied employees may result in more negative attitudes and greater resistance to change. In the end, it is the authenticity of the opportunity as it exists in the minds of employees that matters, not the accouterments of the latest management techniques or tactics.

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APPENDIX A: OVERVIEW OF STRUCTURAL EQUATION MODELING

Benefits and Limits of Structural Equation Modeling

While overtly exotic, Structural Equation Modeling (SEM) or covariance structure modeling (Bentler & Bonnett, 1980; MacCallum, 1986; MacCallum, et al. 1992; Silvia & MacCallum, 1988) is simply an adaptation or extension of the family of general linear models using a system of equations rather than a singular equation to estimate linear relationships among variables (Tanaka, et al., 1990). In the case of SEM, models may include either measured or latent variables, the latter being hypothetical constructs that are not directly measured. Measurement models using multiple observed indicators are first constructed to specify these latent constructs or variables. A structural model then explicitly models directional or non-directional (correlational) linear relationships among these variables (MacCallum & Austin, 2000).

Per Tanaka, et al. (1990), much of the theorizing in psychology revolves around mediational or process-oriented models, but much of the design and statistical apparatus used empirically continues to focus on moderation and interactions. Along with others (e.g., Garson, 2001; Kline, 1998), they claim that a key advantage of SEM versus traditional tools such as ANOVA and multiple regression is that it takes into account *simultaneous* effects of mediation, multicollinearity, measurement error, and multiple independent and dependent latent variables. In addition, modeling forces investigators to clearly articulate assumptions and biases about the psychological processes of interest: associations

among variables, sources of variability, and meanings of core concepts are explicitly and visibly laid out prior to analysis (Tanaka, et al., 1990).

The Downside

The above advantages are, of course, accompanied by disadvantages, many of which can be linked to "willy-nilly" application of tools and interpretation of results. While mathematically very complex, contemporary software packages allow less mathematically sophisticated users access to SEM tools via user-friendly graphical interfaces. The overt simplicity frequently leads to misapplication and misuse of the technique (MacCallum & Austin, 2000; Tanaka, 2000). The following are common problems often associated with studies using SEM and, by highlighting them as potential concerns, we hope to avoid these pitfalls in the dissertation analysis.

Inferences of Causality

While SEM is often described as "causal modeling" it is important remember that research designs, i.e., experimental, controlled studies, not statistical tools form the basis of causal inferences. SEM allows for development of a rich set of hypotheses around relationships and, with longitudinal designs, inferences regarding cause and effect can be more confidently drawn. However, particularly in the case of cross-sectional field designs, the term "causal" cannot legitimately be applied. This study will offer insights regarding complex relationships, but the "arrows" imply directional influence only, not literal causality.

Claims of "True" Models

A fundamental step in a SEM analysis is the designation of model "fit." Good "fit" is sometimes confused with "matching reality" or identification of "true" relationships in the natural world. However, as eloquently stated by MacCallum & Austin (2000, online version, page number unavailable): "With respect to model fit, researchers do not seem adequately sensitive to the reality that there is no true model, that all models are wrong to some degree...and that the best one can hope for is to identify a parsimonious, substantively meaningful model that fits the observed data adequately well." Through the course of this analysis, we hope to identify a plausible model of organizational participation while remaining sensitive to the fact that this model in no way captures reality or cross-situational experiences of all employees.

PHHP

Tanaka, et al. (2000) note that SEM is often criticized as being overly empirical or atheoretical. This criticism has its basis in what could be termed PHHP or "Post-Hoc-Hunt-and-Peck" model specification approaches. Again, contemporary software makes it fairly easy to identify spots in a specified model that are problematic or leading to poor fit. It is also very easy to simply delete or draw arrows until fit indices hit acceptable levels. However, the resulting (and intermediary) models are often entirely nonsensical and/or devoid of any theoretical, much less logical, interpretation. As noted often in this dissertation, the focus of analysis must reflect a balance between model complexity (i.e., "fit"), parsimony, and, most importantly, meaningfulness. Analysis will be biased toward comparison

of a priori models that are theoretically meaningful; empirical model "tweaking" will be limited to adjustments that can be theoretically or, at a minimum, logically justified.

Identification

This is a critical issue in SEM applications and one that is often overlooked or minimally addressed in published studies. Identification is the ability to calculate a unique estimate for every parameter explicated in the model (Judd & McClelland, 1998; Kenny, Kashy, & Bolger, 1998; Kline, 1998); that is, are there adequate numbers of variances and covariances (termed *observations* in SEM applications) contained in the model to calculate unique estimates of free parameters? A model is under-identified if the model has more parameters than observations (an infinite number of solutions); just-identified or saturated if number of parameters equals number of observations (one unique solution); and over-identified if the number of parameters is less than number of observations (no unique solution possible).

The latter situation may initially appear problematic, but actually serves as the basis for model evaluation (Judd & McClelland, 1998; Kline, 1998); i.e., one finds values of parameters that fit some statistical criterion (i.e., minimize the squared differences between the predicted and observed variances and covariances), thereby providing a measure of model "fit." While the details of identification are beyond the scope this proposal (see Bollen, 1989 and Kenny, et al., 1998 for more detailed information), it is essential to assess models prior to analysis to ascertain if there are adequate numbers of variances and covariances to support parameter estimation.

Assumptions of Normality

As in most GLM applications, SEM rests on the assumptions of normality in the data. Again, the ease, and frankly, fun, of SEM statistical software can lead investigators to skip basic data quality checks and "dive in" to modeling too quickly. Nonsensical or, worse, "overtly-correct-but-flawed" output can be prevented by careful examination of raw data as well as univariate and bivariate output prior to application of SEM tools. This step is obviously essential in any application, but seems to be overlooked more often in SEM applications as analysts are seduced by the glamour of the analysis and overt simplicity of the software. While SEM is found to be robust enough to accommodate minor violations of normality (Garson, 2001; Tanaka, et al., 1990), checks and corrections for substantial skewness and kurtosis need to occur prior to any model specification.

Dichotomous and Ordinal-Level Data

Along with assumptions of normality, SEM also assumes interval-level or greater data. However, like other GLM applications, it is often used with ordinal, even dichotomous data. Studies (Tanaka, et al., 1990) have shown that it is primarily statistical inference that suffers under these conditions, not substantive interpretation of output. This assumes, however, that ordinal scales are five points or greater and that dichotomous indicators are used only for exogenous (variables that are not modeled as "effects" of any other latent variable) not endogenous variables. Dichotomous indicators form an exogenous variable (Participation), three point categorical indicators are utilized for two other exogenous variables (Category and Satisfaction) and, for one endogenous factor (Knowledge), one of several

indicators is based on a four-point, rather than five-point, ordinal scale. In general, SEM techniques appear to be robust enough to handle this level of scale violation; however, these scale limitations will need to be accounted for in interpretations of fit, significance tests, and parameter estimates.

Summary of Caveats

In general, SEM is a powerful analysis tool that, when appropriately applied, offers great insight into psychological phenomenon and processes. Like any other tool, however, it is inherently benign – it is in the application and interpretation by the analyst that problems can arise. Following the recommendations of MacCallum & Austin (2000), the issues that may undermine the analysis have been explicated.

Measures and Measurement Model

Indicator Specification

A latent variable and its respective indicators represents an explicit hypothesis about the relationship between a construct and the observed world. Latent variables are central to psychology: constructs that are inferred from observed behavior: attitudes, motivation, cognitive structures, etc. (Tanaka, et al., 1990). Latent variables are not only richer in meaning, but allows one to minimize (and quantify) measurement error. Single measures assume one-to-one correspondence to underlying construct, confounding construct with measure. Multiple measures allow triangulation around "true" score and maximize variance around the construct. It is important to keep in mind, however, that conclusions are

dependent on what we measure; i.e., a different set of indicators may lead to different conclusions (i.e., different meanings and errors around latent variable).

Latent Factor Reliability

Reliability is the precision by which a test score measures an attribute or latent construct (McDonald, 1999). Referring to the true score model of classical test theory: $Y = T + E$

reliability is the degree to which our observed value "Y" reflects "T" or the true score versus error of measurement "E." Put another way, we want the variance in our observed score Y to reflect variance in the true score as much as possible and to be "uncluttered" by extraneous noise or error variance. The goal of reliability assessment for the latent factors is to determine the degree to which measurement error (E) is impacting variance in the observed scores, thereby clouding assessment of "T" or the true latent construct.

Coefficient alpha, a commonly used reliability measure, standardizes all variables, thereby forcing equal variance among indicators (accommodating the rigid assumption of equal variance for parallel forms). An alternative approach which allows the relaxation of the "equal variance" assumption is described in Judd & McClelland (1998): a principal components approach where a set of items is selected that appear to measure the latent construct of interest. A PCA is conducted on the set of indicators and reliability assessed via the following formula:

$$\alpha = (k/k-1) * (1-1/\lambda)$$

where k is number of items and lambda (λ) is the eigenvalue of the first unrotated principal component (or the sum of the squared factor loadings on the first unrotated

principal component). Per Judd & McClelland (1998) this coefficient "has been shown to be the maximum possible alpha for any weighted linear combination of the component items" (p. 204). While there are no hard and fast rules of thumb, we will be looking for factors that show alpha at .70 or better. Conceptually, alpha represents the ratio of true score to total score variance (e.g., T/(T+E)), so a threshold of .70 suggests that roughly 70% of my observed score variance can be attributed to true score variance.

Model Fit, GFIs, and Modification Indices

A small diversion will be taken here to discuss issues around fit and fit indices. This discussion will then cover all subsequent "model fit" applications in this proposal, whether the fit of a single latent construct to a single-factor model, the fit of the entire measurement model relative to expectations around validity, or the various structural models outlined later in the proposal.

Maximum likelihood estimation (MLE) is typically used in CFA/SEM as the focus is on minimizing the discrepancy between the predicted variance/covariance matrix and the one observed in the sample. This discrepancy is distributed as a Chi^2 and we can therefore test whether the predicted and observed models differ from each other. If Chi^2 is not significant the model is described as consistent with the data. Unlike most inferential tests, we want to confirm rather than reject the null hypothesis that the model and data are different from each other. Large samples can be problematic because they can lead to false rejections of the null hypothesis:

statistical power increases the probability of small differences being evaluated as significant.

Goodness of Fit Indicators (GFIs)

Other goodness of fit indicators are less sensitive to sample size and also provide the opportunity to compare the fitted model with other alternative models (i.e., a null model in which there are hypothesized to be no relationships among factors). There are numerous goodness-of-fit indices used in the literature and considerable debate regarding the relative utility and/or stability of various indices (Bollen, 1989; Hu & Bentler, 1995; Kline, 1998; Tanaka, 1993). Consensus is forming around the notion of a "suite" of indices, acknowledging that no single index is superior and that each index offers distinctive information regarding proposed model. Several goodness-of-fit indices (GFI) that will be used in this analysis are outlined below as well as their basis of comparison, benefits, drawbacks, and interpretation.

Chi^2/df

This indicator is sometimes used as a means of reducing the influence of sample size (Kline, 1998) and, while not cast in stone, a value of three or less can be viewed as acceptable. Kline (1998) and Bollen (1989) both note that this measure is not standardized and may be too ad hoc for use in rigorous evaluation, but it seems to provide a subjective sense of the "badness of fit" relative to degrees of freedom.

AGFI

The Adjusted Goodness of Fit Index or AGFI has two advantages. First, it can be interpreted much like an adjusted R^2 in a regression context; i.e., an

indication of the proportion of the observed covariation explained by the model. Secondly, the "A" part of the AGFI adjusts for model complexity – that is, more complex models are penalized for moving away from the criterion of parsimony.

NFI, TLI, CFI

These are classified as "incremental" (Kline, 1998) or "relative" (Tanaka, 1993) fit indices as they provide a measure of improvement of fit of the proposed model over another. The primary difference among these indices is the basis of comparison. For the NFI, or Bentler-Bonett Normed Fit Index, the baseline of comparison is a null model or one in which all observed variable are assumed to be uncorrelated (an independence model). As noted by Kline (1998), an NFI of .80 can be interpreted as the proposed model is 80% better than a null model. The TLI (Tucker-Lewis Index) is another name for the NNFI (Non-Normed Fit Index), which incorporates a correction factor for complexity (as in the AGFI). The CFI or Comparative Fit Index is a modified version of the NFI that accounts for sample size (Kline, 1998).

RMSEA

The Root Mean Square Error of Approximation is a standardized root-mean-square residual, or the degree to which a model over- or under-predicts the covariances among variables, corrected for model complexity (Bollen, 1989; MacCallum, Rosnowski, Necowitz, 1992). Unlike the previous measures (except for Chi^2), this is a "badness of fit measure" where low values (e.g., the closer to 0 the better) indicate few gaps between predicted and observed covariances (residuals).

GFI's are best thought of very crude thresholds or hurdles to further analyses. Just as there is little consensus regarding which index is "best," there is little consensus about what constitutes "adequate" vs. "good" vs. "excellent" fit. For the AGFI, NFI, TLI, and CFI, rules of thumb suggest that values greater than .90 can be interpreted as "adequate." For "badness of fit" indices, numbers approaching 0 are preferred. For Chi^2 and Chi^2/df, values less than three are typically desired; for the RMSEA, values of .08 or less are adequate whereas values less than .05 can be classified as good or very good (obviously, a .02 is excellent whereas a .20 implies substantial gaps between the proposed model and the observed covariations).

If the "fit" of a given model exceeds the threshold for set of indices, one can feel comfortable moving ahead to further assessments based on the model. A "high" GFI, however, does not mean that the proposed model is "the best" or only model that fits the data. It simply means that the data conforms well to a single-factor (or whatever) model. Examining the discrepancies (i.e. residuals) between specific fitted and observed covariances provides more diagnostic information regarding the degree to which the model does or does not fit the data; i.e., a pattern of large discrepancies among a certain cluster of items suggests that these items may not be appropriately collapsed into the proposed model.

While there are rules of thumb for what constitutes "good" fit for most of these measures, it is important to keep in mind that good statistical fit and theoretically meaningful models are not synonymous. In addition, a balance needs to be maintained between good fit, which usually means a more complex model

(e.g., more "free" parameters to estimate) and parsimony. An overly complex model that has outstanding fit is not necessarily superior to a simpler, more theoretically meaningful model with less spectacular fit measures.

Modification Indices

One statistical tool used to assist the analyst in determining where the model may or may not "fit" is the modification index (MI) offered in the output of most SEM software packages. When faced with a less than adequate CFI, RMSEA, or NNFI, the MI is often used as a diagnostic tool to help identify problem areas in the model. Every parameter that is fixed in the proposed model (e.g., a factor, indicator or error is not free to covary with other factors, indicators, or errors) is associated with an MI that indicates the "minimum magnitude by which the overall likelihood ratio Chi^2 value for the model would decrease if the corresponding parameter were freed" (MacCallum, et al., 1992, p. 492).

This is a seductively straightforward tool for respecifying poorly fitting models. For example, if $Chi^2 = 20$ for my proposed model and a parameter has MI = 16, an overtly simple way to get my model to "fit better" is to free up the associated parameter – then, voila, a Chi^2 of 4.00 which is approaching respectability for publication. The seduction occurs due to the "quick fix" aura of the MI. Freeing a parameter (or two, or three, or 15) can result in nonsensical models or, as noted by MacCallum, et al. (1992), lead to "capitalization on chance" models that are unstable, erratic, or invalid.

In some cases, MI's may indeed point to reasonable candidates for respecification; e.g., the errors of two indicators could covary due to their shared

linkage to an unspecified factor or an indicator had, in retrospect, been misassigned to a factor. There may also be instances, however, where large MI's are associated with parameters that, if freed, would not add any interpretation value to the model. In fact, freeing these parameters would greatly "muddy the conceptual waters" and not provide any theoretical insights into the phenomenon.

Measurement Model Convergent/Divergent Validity

Once individual latent measurement models have been established, it is important to examine the convergent and divergent validity of the entire set via a "pure" measurement model or one in which all latent variables are considered to be correlated (double-headed arrow, not single) with all others. This is a step recommended, but often ignored by investigators (Garson, 2001; Kline, 1998).

In the social sciences, we know that have we always imperfect indicators of constructs that contain some amount of each of these three things: 1) the construct of interest or that we want to measure; 2) constructs of disinterest or things we don't want to measure; and 3) measurement error (Judd & McClelland, 1998). These map on to concepts of convergent validity, discriminant validity, and reliability respectively. Per Judd and McClelland (1998), "the central question in measurement concerns the construct validity of the measured variables" (p. 202) and "validity is established ...by the observed pattern of variances and covariances" of measures. For the overall measurement model, we will confirm that the indicators are loading on the constructs they are hypothesized to measure and not on those that are unrelated (i.e., other latent constructs in the model). While some covariance

among indicators is expected, covariance within a factor should be higher than those between factors.

We now must distinguish between two types of latent variables in the structural model: exogenous and endogenous. Exogenous variables can be thought of as independent variables or latents with that are not linked causally/directionally (single-headed arrow[4]) with any other latent variable; these variables can, however, be correlated with each other (i.e., double-headed arrow). Endogenous latents can be thought of as dependent or mediating variables in the structural model; i.e., these are variables that are "effects" of other exogenous or endogenous variables in the model.

Again, a primary advantage of SEM over multiple regression is the ability, in fact, requirement of modeling error explicitly. Error appears in two places in the SEM model and is conceptually different depending on its location. Error of measurement is associated with a given indicator (e.g., in the measurement model, every indicator is "loaded" with the construct at hand as well as measurement error, i.e., the Y = T+E model) and this type of error is always associated with an indicator of a latent factor. Unexplained variance in an endogenous variable or residual error unaccounted for in the model is termed a disturbance and is designated by a D appearing in a circle with an arrow directed to the endogenous construct. It is important to keep these two sources of error distinct as one is related to

[4] A note about notation: arrows are used in model specification to explicate specific hypotheses regarding specific relationships: no arrow is the equivalent of a hypothesis that there is no or a null relationship between factors or variables. Arrow can also be "fixed" at a constant (i.e., 1.0 to set metric for latent variable, see below), or "free" to vary.

measurement and the other related to the variance explained via the structural model.

Modeling Strategy: Plausible Alternative Models

There are three strategies often described for the development and assessment of structural models (Garson, 2001; MacCallum & Austin, 2000): 1) a strictly confirmatory approach where only one model is tested (this model can only be not disconfirmed and cannot be assessed in terms of relative fit); 2) a model generation/modification approach where a proposed model is adjusted post-hoc based on modification indices or other empirical criteria (this is the "PHHP" method noted above that is criticized as empirically driven and atheoretical); and 3) an alternative models approach where more than one a priori model is proposed based on substantive logic or theory and one is ultimately identified as most consistent with the data.

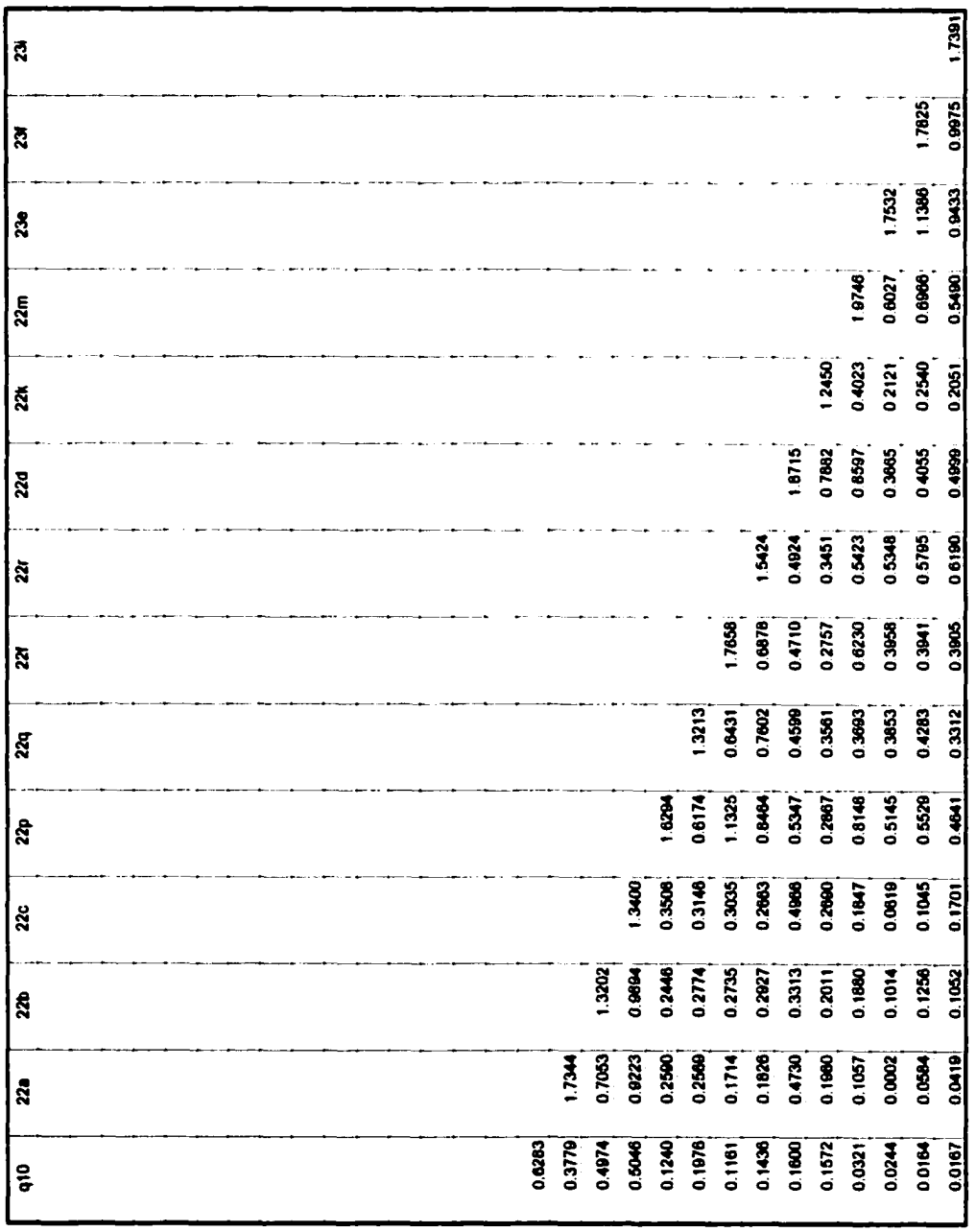
The model generation/modification approach is often found in the literature and is compelling because it is "efficient." MacCallum & Austin (2000) urge investigators to move more toward the "plausible alternative models" approach, with empirical adjustments made only when grounded in theory or defensible logic. The alternative models approach is used for this study and, along with the proposed model and associated hypotheses described above, we will test several other models that could account for the data. These are nested or hierarchically related models (i.e., one model is a subset of the other in that the only difference is in which parameters are freed or constrained) that allow comparison of fit (Kline, 1998). The

key question is if the proposed model appears to fit the data better than more complex or more parsimonious alternative models.

APPENDIX B – COVARIANCE MATRIX

varname_	q32	1a	1b	1d	q27	q29	q33	q13	q14	q31	2e	2f	2n	2d	2k
q32	0.4678														
1a	-0.0314	0.3094													
1b	-0.0337	0.2206	0.3421												
1d	-0.0326	0.2713	0.2255	0.5742											
q27	1.3726	0.1589	-0.0895	0.6239	56.5394										
q29	1.6513	0.0686	-0.3065	0.6227	42.5069	50.5116									
q33	0.3024	0.1041	0.0335	0.2160	8.4520	7.8642	4.2221								
q13	-0.0489	0.0079	0.0169	0.0047	-0.1348	-0.0040	-0.0533	0.2501							
q14	-0.0478	0.0405	0.0211	0.0616	-0.3062	-0.0973	-0.0560	0.0541	0.2503						
q31	-0.0310	0.0157	0.0116	0.0358	-0.1642	-0.0704	-0.0233	0.0461	0.0449	0.1116					
2e	0.0611	-0.2498	-0.2384	-0.4316	-0.5914	-0.4381	-0.2922	-0.0390	-0.1848	-0.0539	1.4577				
2f	0.1359	-0.2817	-0.2654	-0.4868	-0.3261	-0.1922	-0.1998	-0.0469	-0.1936	-0.0445	1.1848	1.5703			
2n	0.1069	-0.3444	-0.2785	-0.5757	-0.6776	-0.8782	-0.2316	-0.0037	-0.1738	-0.0419	0.8385	1.0638	1.5984		
2d	0.0780	-0.2823	-0.2626	-0.4466	-0.6366	-0.2392	-0.2836	0.0126	-0.1659	-0.0538	0.8500	1.0629	0.8788	1.5473	
2k	0.1148	-0.2484	-0.2244	-0.4327	-0.0834	-0.0464	-0.2490	0.0082	-0.1284	-0.0470	0.8048	1.0852	0.9622	0.9516	1.7342
q10	0.1072	-0.0848	-0.0526	-0.0717	0.6060	0.0636	0.0530	-0.1857	-0.0897	-0.0904	0.1254	0.1127	0.0542	0.0668	0.0445
22a	0.1249	-0.0793	-0.0633	-0.0622	0.4378	0.6610	0.2364	-0.1786	-0.1650	-0.0662	0.2486	0.1613	0.1821	0.1203	0.1508
22b	0.0561	-0.0912	-0.0665	-0.0849	0.7194	0.0797	-0.0248	-0.2412	-0.1675	-0.1059	0.2117	0.1602	0.1286	0.1940	0.1414
22c	0.1006	-0.0806	-0.0770	-0.1145	0.3754	-0.0339	-0.0211	-0.2283	-0.1816	-0.1196	0.2466	0.2057	0.1860	0.1797	0.1764
22p	0.0699	-0.2215	-0.1852	-0.3783	-0.9135	-1.2054	-0.5166	-0.0516	-0.1732	-0.0568	0.7427	0.8550	0.7204	0.5756	0.6734
22q	0.0872	-0.2210	-0.2182	-0.2974	-0.1222	0.0348	-0.2439	-0.0642	-0.1837	-0.0573	0.5363	0.6813	0.6389	0.5406	0.5541
22f	0.0753	-0.1798	-0.1953	-0.3236	-0.8981	-1.2804	-0.3643	-0.0328	-0.1233	-0.0363	0.7041	0.7484	0.5646	0.5220	0.5763
22r	0.0062	-0.2515	-0.2238	-0.3318	-0.2834	-0.4324	-0.2666	0.0051	-0.1399	-0.0326	0.5110	0.5675	0.5726	0.4195	0.5331
22d	0.1111	-0.0592	-0.0578	-0.1608	-1.3677	-0.7899	-0.2864	-0.0774	-0.1026	-0.0644	0.4127	0.3116	0.1599	0.0326	0.1231
22k	0.0656	-0.1234	-0.1157	-0.1902	-1.3733	-0.9155	-0.3213	-0.0922	-0.0869	-0.0474	0.3014	0.2856	0.2173	0.0940	0.1377
22m	-0.0164	-0.1020	-0.0745	-0.1368	-1.9415	-1.6245	-0.5648	-0.0379	-0.0378	-0.0192	0.3169	0.3266	0.1102	0.2557	0.2707
23e	-0.0387	-0.0966	-0.0866	-0.1803	-1.4342	-0.8040	-0.3340	-0.0127	-0.0653	-0.0338	0.3542	0.3440	0.1696	0.2236	0.2929
23f	-0.1372	-0.1284	-0.1151	-0.1649	-1.2194	-0.9745	-0.4802	-0.0098	-0.0569	-0.0318	0.3900	0.4138	0.1790	0.2270	0.2020
23r	-0.0304	-0.1005	-0.1284	-0.1779	-1.5611	-0.5873	-0.2861	0.0183	-0.0650	0.0081	0.2962	0.2586	0.1445	0.1122	0.2404

APPENDIX B – COVARIANCE MATRIX



	q10	22a	22b	22c	22p	22q	22f	22r	22d	22k	22m	23e	23f	23i
q10	0.6283													
22a	0.3779	1.7344												
22b	0.4974	0.7053	1.3202											
22c	0.5046	0.9223	0.9884	1.3400										
22p	0.1240	0.2560	0.2446	0.3508	1.6294									
22q	0.1978	0.2569	0.2774	0.3146	0.6174	1.3213								
22f	0.1161	0.1714	0.2735	0.3035	1.1325	0.6431	1.7658							
22r	0.1436	0.1826	0.2927	0.2663	0.8484	0.7602	0.6878	1.5424						
22d	0.1600	0.4730	0.3313	0.4986	0.5347	0.4599	0.4710	0.4924	1.8715					
22k	0.1572	0.1980	0.2011	0.2660	0.2667	0.3561	0.2757	0.3451	0.7882	1.2450				
22m	0.0321	0.1057	0.1880	0.1647	0.8148	0.3693	0.6230	0.5423	0.8597	0.4023	1.9746			
23e	0.0244	0.0002	0.1014	0.0619	0.5145	0.3853	0.3958	0.5348	0.3865	0.2121	0.6027	1.7532		
23f	0.0164	0.0584	0.1256	0.1045	0.5529	0.4283	0.3941	0.5795	0.4055	0.2540	0.6966	1.1386	1.7825	
23i	0.0167	0.0419	0.1052	0.1701	0.4641	0.3312	0.3905	0.6190	0.4939	0.2051	0.5490	0.9433	0.9975	1.7391

APPENDIX C: CORRELATION COEFFICIENTS FOR LATENT VARIABLES IN FINAL MEASUREMENT MODEL

	Tenure	Categ	Satis	Obj P	Subj P	Knowl	PJ	ATT	BEH
Tenure	1.00								
Categ	.34**	1.00							
Satisf	.01	-.10	1.00						
Obj Part	-.11	-.25**	.22**	1.00					
Subj Part	-.05	.16**	-.52**	-.48**	1.00				
Knowl	.04	.15**	-.18**	-.64**	.18**	1.00			
PJ	-.11	.12*	-.51**	-.55**	.68**	.33**	1.00		
ATT	-.22**	.12*	-.19**	-.35**	.28**	.36**	.57**	1.00	
Beg	-.17**	-.12*	-.23**	-.18**	.29**	.09	.51**	.43**	1.00

* = sign at .05

** = sign at .01