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This is to certify that the

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AN EXPLORATION OF THE DETERMINANTS OF ORGANIZATIONAL-LEVEL TURNOVER

by

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ABSTRACT

AN EXPLORATION OF THE DETERMINANTS
OF ORGANIZATIONAL LEVEL-TURNOVER

By

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Turnover research has traditionally focused on the variables that have an effect on an individual's decision to leave an organization. The present study examines turnover at the organizational level of analysis, which focuses on the determinants of organizational turnover rates. A model of organizational-level turnover was proposed. The measures of the model components were obtained from principals and teachers in 188 schools who completed questionnaires in 1987. Turnover data was later obtained from the principals of the schools. The proposed model was subjected to a LISREL analysis. The results of the analysis suggested that the proposed model did not adequately represent the turnover process at the organizational level. However, the original analysis and a revised analysis indicated that the relationships between turnover and a measure of the labor market, average teacher salary, and the percentage of teachers that belonged to a union were significant and negative. Future research directions are suggested.

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INTRODUCTION

According to Steers and Mowday (1981), over 1000 empirical studies of turnover had been conducted prior to 1981, as well as thirteen review articles. Turnover research has focused on identifying the reasons why individuals choose to leave an organization. Recently, researchers have emphasized the importance of also examining turnover at the organizational level (Baysinger & Mobley, 1983; Bluedorn, 1982b; Terborg & Lee, 1984). The study of organizational turnover focuses on the determinants of turnover rates of organizations. The turnover rate of an organization is often defined as the percentage of workers who voluntarily leave the organization during a specified period of time. Although the concept of organizational level turnover has not received much attention in the literature, it is important to study because of the effect that the turnover rate of an organization has on many other aspects of the organization. According to Bluedorn (1982b), the consequences of turnover on the organization is one of the most salient issues in turnover research. While the consequences of turnover are important, the identification

of the determinants of organizational turnover is also critical if we are to understand and learn how to deal with organizational turnover.

This introduction is divided into four sections. The first section provides more detail on why organizational turnover is important to study. The next two sections focus on turnover at the individual and organizational levels, respectively. Within the organizational turnover section, the proposed model is presented, and levels of analysis issues are discussed. Also in this section, further support is presented for how the study of organizational level turnover may add to our understanding of the turnover construct. The final section of this introduction consists of the hypotheses associated with the proposed model.

Importance of Turnover

Consequences of Turnover

Several researchers have discussed the effect that turnover has on various organizational processes. Research suggests that organizational turnover has an impact on processes such as innovation, formalization, and communication (Bluedorn, 1982b; Muchinsky & Morrow, 1980; Price, 1977). The economic consequences of turnover have also been a concern in the literature. The effect of organizational level turnover on each of these processes

and the economic implications of turnover is briefly described.

Innovation. There is some evidence to suggest that a higher rate of turnover may result in a higher degree of innovation. It has been suggested that new employees bring fresh ideas into the organization which in turn helps an organization continue to grow (Grusky, 1959; Muchinsky & Morrow, 1980; Staw, 1980). This proposed effect of turnover on innovation is based on the results of a few empirical studies, so further work is needed (Muchinsky & Morrow, 1980; Price, 1977). Bluedorn (1982b) suggests that turnover may result in greater innovation when replacement employees are hired from outside of the organization, into top-level positions.

Formalization. Turnover may be related to the degree of formalization in an organization in that higher rates of turnover can result in a reliance on formal rules and norms. When turnover rates are high, the rules of the organization have to be more explicit so new workers or new management can begin to learn these rules, and be able to function within the organization (Muchinsky & Morrow, 1980; Price, 1977). For instance, Carlson (1962) states that newly-hired school superintendents focus on procedures and making rules early in their tenure. This was also found in a very different setting, a prison camp (Grusky, 1959). Grusky (1959) reported that one new

supervisor initiated 52 new rules for the prisoners. However, according to Bluedorn (1982b), the ability of the organization to enforce formal rules decreases when turnover is very high. Thus, Bluedorn (1982b) contends that the relationship between turnover and formalization is an inverted U-shaped one; thus when turnover rates are extremely high, formalization will decrease.

Communication. The communication networks in an organization may also be affected by the rate of turnover. It is suggested that when the amount of turnover is high the quantity of communication increases, but the quality of the communication decreases (Bluedorn, 1982b). The amount of communication increases because more socialization and training of new employees will have to take place. However, the quality declines because turnover interferes with the links in the communication networks. Higher amounts of turnover result in gaps in the networks because individuals who were previously part of the network have left the organization (Bluedorn, 1982b).

Economic Consequences. It also seems likely that turnover has an impact on various economic aspects of the organization. Several researchers argue that there are some positive effects of turnover, including a decrease in payroll and benefit costs, and an increase in the opportunities for movement or promotions in the

organization (Dalton & Todor, 1982; Muchinsky & Morrow, 1980; Staw, 1980).

However, negative consequences of turnover are also discussed in the literature. It is costly to recruit, hire, place, and train new employees. In fact, Macy and Mirvis (1976) found that it could cost the organization five times what that employee earns a month or more to hire and train his/her replacement (Lawler, 1981). Productivity may also decrease as new workers are adjusting to the job, although some researchers suggest that productivity may increase if the new employees have higher motivation levels or are more skilled than the previous employees (Muchinsky & Morrow, 1980; Staw, 1980).

Turnover as a Criterion of Effectiveness

The turnover rate of an organization is also one important aspect of organizational effectiveness models. The history of organizational effectiveness research has been complex in that a number of different models of organizational effectiveness have been proposed in the literature (Cameron & Whetton, 1983; Seaton, 1984). Turnover could serve as a criterion of effectiveness in most of these models depending on the type of problem under study (Goodman & Pennings, 1977b). Cameron and Whetton (1983) assert that no one model or approach to organizational effectiveness is better than another, because the approach selected should depend on the

situation and the factors involved. Furthermore, these researchers suggest that the different models of organizational effectiveness exist because of the variety of ways in which an organization can be conceptualized. For instance, some researchers look upon organizations as entities attempting to obtain goals (Goodman & Pennings, 1977b), while other individuals use a different framework to understand organizations (e.g., concept of social contracts, Keeley, 1980). Goodman, Atkin and Schoorman (1983) contend that one single theory will probably never be developed because researchers cannot agree on the definition of the effectiveness construct. However, many seem to agree that organizational effectiveness is an abstract construct that is defined by the researchers and by the situation (Cameron & Whetton, 1983; Goodman & Pennings, 1977b; Steers, 1977).

Summary of the Importance of Turnover

There are both practical and theoretical reasons to study organizational level turnover. From a practical standpoint, it would be useful for management to understand what causes organizational turnover. Turnover may be very costly to some organizations, and the identification of the determinants of turnover would be important to those who were interested in reducing the turnover rate in their organization.

The study of turnover also has theoretical implications. The concept of turnover is related to many other organizational constructs, several of which have been discussed previously. For instance, Bluedorn (1982b) considers turnover a disruption in the open systems perspective of input-throughput-output, because it has an effect on aspects of the organization such as communication networks and productivity. Moreover, Staw (1980) suggests that a high rate of turnover will be costly in an organization where the work of some employees is dependent upon that of other employees. Finally, some empirical evidence of the effect of turnover on other organizational constructs has been found in a recent study by Mueller and Price (1989). These researchers examined the effect of work unit turnover on integration, centralization promotion opportunities, instrumental communication, job satisfaction, and behavioral commitment (i.e., turnover intent). The results of the study indicated that turnover had a negative effect on instrumental communication and behavioral commitment.

Turnover can also be considered one criterion of organizational effectiveness, thus understanding the determinants of turnover may be useful to researchers of organizational effectiveness. This study is also theoretically important because it addresses several levels of analysis issues that have been of interest in

the literature recently, such as aggregation and composition modeling. These issues are discussed in a later section of this paper. In the next section, the results of individual-level turnover research will be reviewed briefly, followed by a discussion of organizational-level turnover.

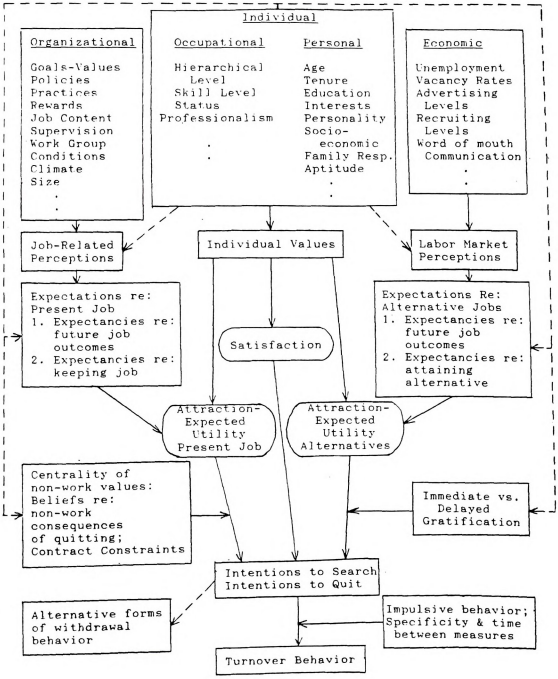
Individual Level Turnover

Individual-level turnover has been the primary focus of the turnover literature. An examination of organizational-level turnover therefore should begin with an understanding of what occurs at the individual level. One of the most recent reviews of individual-level turnover states that "... turnover is generally thought to be a function of negative job attitudes combined with an ability to secure employment elsewhere" (Steers & Mowday, 1981, p. 237). Steers and Mowday also state that factors other than job attitudes will affect turnover.

Research on individual-level turnover has often attempted to identify the specific determinants of turnover. A number of causal models have been proposed and examined in the literature (e.g., Bluedorn, 1982a; Mobley, Griffeth, Hand, & Meglino, 1979; Price, 1977; Steers & Mowday, 1981). The most widely used individual-level model of turnover has been a comprehensive one proposed by Mobley et al. (1979), and is presented in Figure 1. This model includes organizational, individual,

Figure 1

Mobley's Model of Individual Level Turnover



and economic variables, as well as individual perceptions, and nonwork variables. The model proposed by Mobley et al. (1979) is much too complex to be examined in any one study, but can be thought of as a general framework which includes the types of variables that may affect the turnover process. However, this model has stimulated the interest of researchers over the years, and as a result, a large number of studies have examined various aspects of the model. This model has also been used by researchers to further refine the turnover model, and to develop other related models. For example, subsequent revisions of the model added the concept of organizational commitment to the process, and Steers and Mowday (1981) later included job involvement, job performance, and efforts to change the present situation. While the Mobley model includes organizational level variables (such as organizational climate and organizational size), all tests of the model have been conducted at the individual level.

The following review focuses on the types of variables that are most often found in studies of turnover. Table 1 consists of a list of variables, which have been shown to have the strongest relationships with the turnover construct (Cotten & Tuttle, 1986). The variables in Table 1 have been categorized into four

Table 1

Correlates that are often found in Turnover Studies

Economic Correlates

Employment Perceptions

Labor Market Conditions

Organizational Correlates

Unionization

Work-related Correlates

Salary

Satisfaction

Organizational Commitment

Job Performance

Personal Correlates

Demographic

Met Expectations

Behavioral Intentions

groups: economic, organizational, work-related, and personal. Each of the variables listed will be reviewed in subsequent sections. However, before reviewing this research, a discussion of the measurement of the turnover construct would be appropriate because several measurement issues should be understood when conducting or reviewing turnover research.

Measurement of Turnover

The measurement issues that should be considered when doing research on turnover include: (1) the use of turnover intent as a proxy for actual turnover, (2) the type of turnover measure that will be used, and (3) whether individual-level turnover is thought to have positive or negative outcomes.

The Use of Turnover Intent. Several researchers have used turnover intent as a proxy for actual turnover (e.g., Martin, 1979; Werbel & Bedeian, 1989). In order to discuss this measurement issue, it is important to know that turnover intent and actual turnover are moderately to highly correlated. The correlation between turnover intent and turnover has ranged from .19 to .71 in a number of studies (e.g., Arnold & Feldman, 1982; Hom, Griffeth, & Sellaro, 1984; Lee & Mowday, 1987; Miller, Katerberg, & Hulin, 1979).

There are a number of potential reasons for the differences found in the correlations between turnover

intent and turnover. First, the items used to assess the turnover intention construct were very different in the various studies. Second, the amount of time between the initial questionnaire and obtaining the turnover data ranged from six months to one year. Finally, at least one study did not distinguish between voluntary and involuntary turnover (Arnold & Feldman, 1982). These differences could account for the range of correlations that have been reported. However, even when turnover intent and turnover are highly related (e.g., .71), these constructs are not identical, and researchers that attempt to predict turnover intent are studying only part of the turnover process, not turnover itself.

Voluntary vs. Involuntary Turnover. Another distinction in the literature is whether turnover is self-initiated or organizationally-initiated. Voluntary turnover is defined as "individual movement across the membership boundary of a social system which is initiated by the individual" (US Bureau of Labor Statistics 1966, p. 1, cited in Price, 1977). In contrast, involuntary turnover is initiated by the organization, and would include individuals who have been fired or laid off. Additionally, involuntary turnover includes those individuals who have retired or died. According to Price (1977), voluntary turnover is usually studied in turnover

research, and most of the studies that will be reviewed used voluntary turnover as their criterion.

Functional Turnover. One recent view in the turnover literature is that not all turnover is negative (Abelson & Baysinger, 1984; Dalton & Todor, 1982; Hollenbeck & Williams, 1986; Mobley, 1982b; Porter & Steers, 1973). Dalton, Todor, and Krackhardt (1982) contend that the negative consequences of turnover have been exaggerated. It is also argued that turnover can have positive consequences for the organization in that new individuals will increase innovation and cause technological change (Dalton & Todor, 1979).

A distinction has been made between turnover that is functional and turnover that is dysfunctional. Functional turnover includes those individuals who leave who are considered to be poor performers. In contrast, dysfunctional turnover occurs when an organization loses good performers. The importance of this distinction is that the effect of the turnover of the good performers on the organization is different from the effect of poor performers leaving. From the group of people that leave an organization each year, there will be some individuals that management does not want to lose, and others that will not be missed. Dalton et al. (1982) suggest that two subjective methods of classifying an individual as a functional leaver or a dysfunctional leaver might be

performance ratings or whether the organization would rehire the person if given the chance. Other more objective measures might be productivity or sales measures.

According to Mobley (1982b), most organizations do not consider the performance or ability level of those who leave. In addition, many researchers also do not make the distinction between good and poor performers (Mobley, 1982b). Staw and Oldham (1978) also suggest that a reconsideration of the dependent variables used so often in industrial organizational research is necessary. The three dependent variables mentioned were task performance, absenteeism, and turnover. The utility of these variables to different groups in the organization is one focus of Staw and Oldham's argument. For instance, while management might consider all turnover as dysfunctional, the workgroup losing a poor performer would regard the turnover of that individual as functional. Most of the studies that will be reviewed in the following sections do not distinguish between functional and dysfunctional turnover.

Economic Correlates

Two economic constructs that have often been found in studies on turnover are employment perceptions and labor market conditions. These constructs are theoretically

similar, but the first is subjective while the second is a more objective measure.

Employment Perceptions. Employment perceptions refer to the degree to which an employee perceives that other job opportunities are available, or the utility of searching for another job (Steers & Mowday, 1981). Empirical support for the relationship between employment perceptions and turnover has been mixed. A recent review listed twenty-one studies that had examined the relationship between employment perceptions and turnover; only eight of the studies reported a significant correlation (Steel & Griffeth, 1989). Additionally, the significant correlations that were reported were small, most below .20.

Even with the lack of support found for the effect of employment perceptions, researchers believe that this construct is an important variable in the turnover process, but its effect has been limited by the existence of other variables or methodological problems (Hulin, Roznowski & Hachiya, 1985; Steel & Griffith, 1989).

Hulin et al. (1985) provided three explanations for the lack of support for the relationship between employment perceptions and turnover. First, they suggest that the composition of the work force may be dependent on the existing economy. That is, individuals who voluntarily work part-time, or drift from one job to

another may be temporarily attracted to a full-time position during the times when there are many jobs to be filled. When these workers decide to leave their jobs, the decisions may not be based on the usual reasons (e.g., other opportunities, dissatisfaction with job), but their termination decision may be based on the desire to return to temporary work. A second suggestion is that the effect of employment perceptions on turnover intent is indirect, and mediated by job satisfaction. Most studies have examined the direct relationship between perceptions of job opportunities and turnover (e.g., Arnold & Feldman, 1982; Michaels & Spector, 1982; Miller, Katerberg & Hulin, 1979). The third suggestion is that employment perceptions may influence turnover directly, not indirectly through turnover intent.

Steel and Griffeth (1989) have also suggested three possible explanations for the lack of support for the employment perceptions - turnover relationship in the literature, but their focus is on methodological problems. The first issue is that researchers limit the potential of this relationship because they usually sample only one job in one organization in one region and at one point in time. Steel and Griffeth (1989) contend that if researchers would expand their samples to include more jobs or regions of the country, the variance in the employment perceptions would increase. A second issue is

that researchers often do not acknowledge the effect of the turnover base rate on their results. Thus, the results of turnover studies will be affected by the amount of variance in the turnover construct. Finally, Steel and Griffeth (1989) along with Griffeth and Hom (1988) show that the employment perceptions construct is operationalized differently across studies, and suggest that this lack of consistency may have an effect on the relationship between this construct and turnover. Steel and Griffeth (1989) also note that a number of studies use only one item to measure employment perceptions which could serve to decrease the reliability of this construct.

Labor Market Conditions. The condition of the labor market was a construct suggested by the Mobley et al. (1979) model. Individual-level research suggests that the effect of labor market conditions on turnover intentions is mediated by individuals' perceptions of the availability of other jobs (Lee & Mowday, 1987). In addition to the perceptual measure described above, a literature review by Muchinsky and Morrow (1980) supports the inclusion of an objective measure of labor market conditions. They suggest that economic conditions have a strong impact on turnover, and cite a number of studies to support this contention. For instance, Woodward (1975/76) has discussed a framework that could be used to understand how the labor market influences turnover. This framework,

called the push-pull approach, consists of two classes of factors. Push factors are those that originate within the organization that lead to problems (e.g., increased dissatisfaction and decreased commitment) which push the employees away from the organization. Pull factors occur outside the organization (e.g., demand for labor) and entice employees away from their present organizations.

Woodward (1975/76) asserts that one main cause of higher turnover rates during times of low unemployment is an increase in the variety of jobs that are available to workers. In addition to a variety of jobs, there is an increase in certain types of jobs that may be attractive to workers such as daywork or better working conditions.

Another potential cause of increased turnover rates when unemployment is low is that the standards used in selection are lowered (Woodward, 1975/76). As an example, Woodward (1975/76) examined scores from selection tests over a two-year period for one organization. The results indicated that the percentage of recruits who had obtained lower percentile scores on the selection tests increased during months of lower unemployment. However, the results reported were percentages and no significance tests were conducted, thus the results are only suggestive.

Research has suggested that labor market conditions may not have a direct effect on turnover, but may moderate the relationship between satisfaction and turnover.

Muchinsky and Morrow (1980) suggest that fewer people will leave their jobs during periods of high unemployment, thus the relationship between satisfaction and turnover will be deflated. However, when there are more jobs available in the work force, more individuals who are not satisfied with their present position will leave, and the correlation between satisfaction and turnover will be higher. Two meta-analytic studies have examined this relationship. The first, conducted by Shikiar and Freudenberg (1982), indicated that the satisfaction-turnover relationship was strongest when the unemployment rate was high, which is just the opposite of what Muchinsky and Morrow (1980) had proposed. However, Carsten and Spector (1987) found a number of methodological problems with the Shikiar and Freudenberg (1982) study, and after correcting for these problems, replicated the meta-analysis and found that their results did support the hypothesis of Muchinsky and Morrow (1980).

Organizational Correlates

Unionization. The only organizational correlate that has been examined consistently in the literature in relation to turnover is the presence of a union. This construct has been examined as both a direct and an indirect predictor. Researchers have hypothesized that unionization leads to longer tenure and more job security because of the system set up by unions to deal with

problems (Farber, 1980; Wales, 1970). For instance, Freeman (1980) noted that 99% of the major organizations that are unionized in the United States have collective bargaining contracts that include grievance procedures. However, only 30% of the non-unionized organizations that belong to the Bureau of National Affairs Personnel Policies Forum report having any formalized grievance procedures. Thus, the union system would directly affect turnover. Empirically, Farber (1980) showed that out of a sample of 944 people, non-unionized individuals were more likely to quit than were unionized workers. Farber (1980) did not indicate how many of the workers in the sample were unionized. A second study also resulted in unionized workers having lower quit rates (Wales, 1970).

Unionization has also been hypothesized to be an indirect predictor of turnover mediated by satisfaction. This hypothesis is called the "exit-voice tradeoff" which means that employees who are dissatisfied with working conditions do not have to leave the organization because they have a voice in their union, and can use their union to help them solve problems. The presence of a union is thought to have a negative affect on satisfaction, because unions often make workers more aware of company deficiencies, and union jobs may be more unpleasant than non-unionized jobs (Borajas, 1979; Farber, 1980). Borajas (1979) reported that the presence of a union did have a

direct negative effect on job satisfaction. Additionally, Freeman (1980) found that both satisfaction and the presence of a union were related to turnover rates. Workers who were highly satisfied were more likely to stay with their organization than were dissatisfied workers, and individuals who belonged to a union were more likely to stay than were non-unionized workers. However, Freeman's (1980) results were reported as percents, and are only suggestive.

Work-Related Correlates

Four work-related constructs that are often found in turnover research are salary, satisfaction, organizational commitment, and job performance. Each of these constructs are discussed below.

Salary. Salary is usually considered an indirect predictor of turnover intent, mediated by satisfaction, in models of turnover. According to Lawler (1981), employees are satisfied or dissatisfied with pay for several reasons. Satisfaction with pay is influenced by the amount received, as well as the amount that employees think they should receive. Satisfaction with pay is also affected by a comparison between one's job and salary with what other employees do in their jobs and the amount of salary that they receive. If employees become too dissatisfied with their salary, they will consider leaving their organization. Price (1977) cited a number of

studies that found a negative relationship between salary and turnover, and Steers and Mowday (1981) contend that salary should affect job attitudes which in turn will influence turnover intent.

Support for this relationship has been demonstrated. For instance, Motowidlo (1983) found that although amount of pay and pay satisfaction are highly related ($r = .51$, $p < .01$) and pay satisfaction and turnover intent are significantly correlated ($r = .48$, $p < .01$), amount of pay and turnover intent are not related ($r = .21$, ns). Another study examined this relationship somewhat differently. Hom, Griffeth, and Sellaro (1984) measured perceptions of inequity, job satisfaction, and thoughts of quitting. Thoughts of quitting precedes turnover intent in their model, but the two constructs are similar in content. Their analyses indicated that the inequity perceptions construct was predictive of job satisfaction, and job satisfaction was predictive of thoughts of quitting.

Satisfaction. In most models of turnover, satisfaction is thought to be related to turnover intent which in turn influences actual turnover. It is possible that satisfaction also has a direct effect on turnover decisions, but empirical evidence suggests that the relationship is an indirect one. Research has consistently shown that the relationship between

satisfaction and turnover intent is significant and negative (e.g., Arnold & Feldman, 1982; Jackofsky & Slocum, 1988; Michaels & Spector, 1982; Parasuraman, 1982). The measurement of satisfaction has varied across studies from general scales to facet scales to intrinsic and extrinsic scales of satisfaction, but a significant negative relationship between satisfaction and turnover intent is observed consistently.

Organizational Commitment. The effect of organizational commitment on turnover is also thought to be mediated by turnover intent (e.g., Lee & Mowday, 1987). The relationship between commitment and turnover intent is consistently significant and negative (e.g., Arnold & Feldman, 1982; Mowday, Koberg, & McArthur, 1984; Parasuraman, 1982).

One problem with the commitment construct is that some researchers include items that are similar to turnover intent items when measuring organizational commitment (e.g., Angle & Perry, 1981; Welsch & LaVan, 1981). An example of an item that is similar to both scales is "It would take very little change in my present circumstances to cause me to leave this organization" (Angle & Perry, 1981, p. 5). The inclusion of these items confuses the interpretation of observed relationships between commitment and turnover intent.

There has been some disagreement over whether commitment leads to satisfaction or satisfaction is predictive of commitment. Williams and Hazer (1986) conducted a series of path analyses to address this question. The results of their study indicated that for two different samples (community mental health center and insurance company employees), the model that included a causal link from satisfaction to commitment fit the data better than did a similar model that included a causal link from commitment to satisfaction. However, a later study also examined this relationship using path analysis and concluded that both models were supported (Farkas & Tetrick, 1989). Both Williams and Hazer (1986) and Farkas & Tetrick (1989) contend that commitment and satisfaction are related, but that the direction of any causal influence between the two constructs cannot be determined. Farkas and Tetrick (1989) suggest that another explanation for the strong relationship between these two constructs is that they are not completely distinct operationally. Further research designed to examine this relationship is required.

Job Performance. The role that this construct plays in the turnover process is unclear at the present time. It was initially proposed as a predictor of affective variables (Steers & Mowday, 1981), but has also been examined in the literature in several other ways. Lee and

Mowday (1987) did examine job performance as a predictor of affective constructs and found that job performance was predictive of organizational commitment and job involvement, but not of job satisfaction. In contrast, Jackofsky and Slocum (1988) showed that job performance was related to a measure of extrinsic satisfaction, but not intrinsic satisfaction. Performance is also seen as a direct precursor of turnover (Stumpf & Dawley, 1981). These researchers reported that two performance indices were significant predictors of turnover even after the variance due to demographics and an absenteeism measure was removed. One of these studies did address the issue of functional versus nonfunctional turnover, and found that performance was lower for those individuals that left the organization (Dreher, 1982). However, the other studies that examined the role of performance did not examine this issue.

Using a different conceptualization of the role of performance, Spencer and Steers (1981) examined performance as a moderator of the satisfaction-turnover relationship and found a significant interaction between performance and satisfaction. Finally, a recent study examined the relationship between performance and turnover intent, moderated by age (Werbel & Bedeian, 1989). These researchers found a significant main effect for performance as well as a significant interaction between

performance and age. One major problem with the research on the role of job performance in the turnover process is that researchers ignore the work conducted by others on the role of job performance. It would be useful if researchers would discuss how their results could be compared to other work in this area. The existence of job performance in the turnover process seems to be important, but the actual function of the construct is unclear.

Personal Variables

Personal variables that are often thought to influence turnover decisions include demographic variables, met expectations, and behavioral intentions. Research on each of these types of variables will be discussed in the next sections.

Demographic Variables. The demographic variables that are often found in turnover research are age, education, marital status, gender, number of dependents, and tenure. Each of these variables has been found to be significantly related to turnover or turnover intent in some studies, but the variables that are most consistently related are age, education, and tenure (Arnold & Feldman, 1982; Martin, 1979; Mitchell, 1981; Parasuraman, 1982; Spencer & Steers, 1981). The effect of age on turnover intent is sometimes mediated by satisfaction or commitment (e.g., Martin, 1979; Michaels & Spector, 1982; Williams & Hazer, 1986), but direct negative relationships with

turnover and turnover intent have also been observed (Martin, 1979; Parsuraman, 1982). Education is most often hypothesized to have a direct positive relationship with turnover and turnover intent, while tenure is reported to have a direct negative relationship (Mitchell, 1981; Parasuraman, 1982; Spencer & Steers, 1981).

Met Expectations. The expectations of employees are thought to influence affective responses in the turnover process (Bluedorn, 1982b; Lee & Mowday, 1987; Steers & Mowday, 1981). It has been suggested that when expectations are met, affective responses (e.g., satisfaction, commitment) are more positive and turnover decreases (Steers & Mowday, 1981). However, empirical support for this proposition has been mixed.

Dugoni and Ilgen (1981) examined the effect of realistic job previews (RJP's) on the expectations - satisfaction - turnover process. They found support for the relationship between satisfaction and turnover, but did not find a significant relationship between met expectations and satisfaction. Similarly, Reilly, Tenopyr, and Sperling (1979) reported in their study that the relationship between the use of RJP's and turnover was not significant.

In contrast, the results of several studies have supported the inclusion of met expectations in the turnover process. Lee and Mowday (1987) found that met

expectations were predictive of job satisfaction, commitment, and job involvement. Additionally, Hom, Griffeth, and Sellaro (1984) and McKemey and Sims (1977, 1980, cited in Bluedorn, 1982b) reported that expectancies were significant predictors of satisfaction.

Turnover Intent. Intent to leave an organization is another variable that has been found to be related to turnover in numerous studies (e.g., Arnold & Feldman, 1982; Hom, Griffeth, & Sellaro, 1984; Michaels & Spector, 1982; Williams & Hazer, 1986). In fact, Bluedorn (1982b) reported that in 23 studies that had collected data on both turnover intent and turnover behavior, all 23 of the studies found a significant positive relationship between the two variables. Moreover, in 19 out of 20 studies, the intent to turnover construct was more predictive of turnover behavior than any other predictor.

Summary and Critique

It should be recognized that one integrated theory of turnover does not really exist. A number of different models of turnover can be found in the literature, and the focus of some of these models differ (e.g., met expectations, organizational commitment). Most of the studies in the literature are testing one aspect of these more detailed models proposed by researchers such as Mobley et al. (1979) and Steers and Mowday (1981).

The above review has described the research found on the types of variables that are often studied in relation to individual-level turnover. Some of the constructs discussed are consistently related to turnover, while others are not. The variables that have been consistent correlates of turnover are salary, satisfaction, commitment, certain demographics, and turnover intent. Constructs that have been inconsistently related to turnover include employment perceptions, unemployment rate, presence of a union, job performance, and met expectations.

This review was not meant to suggest that these variables are the only ones related to turnover, but they are the constructs that are most frequently found in turnover studies and turnover models. Other potential correlates of turnover have been examined in a few studies. These include personal correlates such as job involvement, and various nonwork variables (e.g., family size) (e.g, Lee & Mowday, 1987). The constructs reviewed above appear to be most representative of the turnover literature. Two variables that have received recent attention in the literature and merit some consideration are climate and leader-subordinate relations.

Climate. Climate can be defined as the perceptions of individuals of their environment or work setting. The concept of climate was present in the original Mobley et

al. (1979) model, but attempts to test this model at the individual-level usually have not included climate as a direct or indirect predictor of turnover. One exception was a study conducted by Martin (1979). The results of this analysis indicated that the relationship between several climate dimensions (i.e., routinization, communication, distributive justice) and turnover intent was mediated by satisfaction.

In addition, an examination of the climate literature indicates that the suggested relationship between climate and turnover has also been virtually ignored. However, two studies were located. In one study, the researchers found a significant relationship between a measure of climate and turnover intentions (Schneider & Bowen, 1985). In a second recent study, Jackofsky and Slocum (1988) examined the relationship between seven climate dimensions (e.g., supervisory style) and turnover intentions. In this longitudinal study, significant relationships between the climate dimensions and turnover intent over two time periods were reported. The results of these studies indicate that the climate construct should be considered as an important part of the turnover process.

Leader-Subordinate Relations. This construct is often considered to be one of the many dimensions of climate. However, several researchers have focused their attention on this climate dimension, while not addressing

other dimensions. Early research indicated that leader behavior was related to turnover (Fleishman & Harris, 1962). The role of this construct in the turnover process was then ignored for a number of years. However, recent research has been particularly supportive of the notion that a subordinate's perception of a leader's consideration or supportiveness has an effect on whether or not the subordinate leaves the organization (Ferris, 1985; Graen, Liden, & Hoel, 1982). Furthermore, the results of one study showed that the relationship between leadership consideration and turnover was mediated by job satisfaction, organizational commitment and turnover intent (Michaels & Spector, 1982). These few studies lend support to the hypothesis that the relationship that subordinates have with their superiors may affect the turnover process.

The review of the individual-level research suggests that many different types of variables can influence an individual's decision to leave an organization. Some of these variables will also be important at the organizational-level of analysis, while others will be less important. For instance, Rousseau (1985) contends that research has shown that economic variables account for 70% of the variance in turnover at the unit level, while behavioral intentions and attitudes account for 70% of the variance at the individual level. Additionally,

some of the variables that will be important at the organizational level will be different from those that were discussed earlier. Now that research relating to turnover at the individual level has been discussed, the focus of this paper will turn to organizational-level turnover.

Organizational Level Turnover

Roberts, Hulin and Rousseau (1978) maintain that examining an area of research at only one level of analysis may be misleading. An example provided by these researchers illustrates their contention. When this book was published in 1978, the only variable that appeared to be consistently related to organizational turnover rates was economic conditions. Since then, researchers have not consistently identified many other predictors of organizational turnover, so the following example is still appropriate. Roberts et al. (1978) suggested that a manager may want to reduce the high rates of turnover within subunits of an organization. One of the only suggestions that could be given to this manager would be to change the economic rewards, which an individual manager cannot often control. Roberts et al. (1978) suggested that subunit turnover rates may also be related to several variables including management style and level of employee satisfaction. These authors contend that an area of research such as turnover is complex and should be

studied at different levels of analysis so that the constructs that are important at each level can be identified. Roberts, et al. (1978) conclude that "only in this way will we be able to determine the direct and indirect influences of environmental and organizational characteristics on individual behaviors" (p. 134). If the determinants of turnover at the organizational level are different than those at the individual level, then the identification of the variables important at the organizational level will broaden our understanding of the turnover construct.

This section of the paper first reviews research conducted previously on organizational-level turnover. Then a model of organizational-level turnover is introduced, and the components of the model are discussed. The model includes organizational-level constructs that may influence the turnover rate of an organization. Furthermore, an attempt is made to include constructs that were important at the individual-level of analysis, if these constructs also exist at the organizational level.

Previous Research

Early research on organizational turnover focused mainly on the rate of turnover in an organization. Price (1977) cited 53 studies that examined organizational turnover rates, defined as the percentage of employees that left an organization during a specified period of

time. Most of these researchers were interested in identifying turnover rates for various types of organizations (e.g., manufacturing, mining, government). Several studies did explore the determinants of organizational turnover. For instance, one early examination of nursing personnel turnover by Levine (1957) indicated that the turnover rate of hospitals was affected by the size of the hospital, ownership (i.e., government, church, other), and whether the hospital had a school of nursing. Other early studies of turnover rates that have examined the relationships between turnover rates and constructs such as labor market conditions and wage rates (e.g., Eagly, 1965; Wales, 1970) will be discussed in more detail in subsequent sections.

More recently, researchers have begun to focus on the determinants of organizational turnover. Baysinger and Mobley (1983) asserted that an aggregated measure of turnover is important to the development of personnel policies. They were interested in understanding the "quit propensity" or turnover intention of the average employee in an organization. Baysinger and Mobley (1983) presented a model that included the costs and benefits of staying or leaving an organization, as well as the degree of job dissatisfaction due to on-the-job experience. The model posits that individual factors, organizational factors,

and environmental factors each have an effect on the components of the model.

Other researchers have attempted to identify the determinants of turnover in empirical studies. In a longitudinal study, Terborg and Lee (1984) found that they could reliably predict turnover in a sample of sales personnel over two data collection periods. The predictors identified were local economic activity, average age, tenure, time in present position, and education. In contrast, they were not able to find reliable predictors for a management group. A second organizational-level study identified a relationship between organizational commitment, turnover intent, and turnover rate (Angle & Perry, 1981). However, there were some methodological problems with this study.

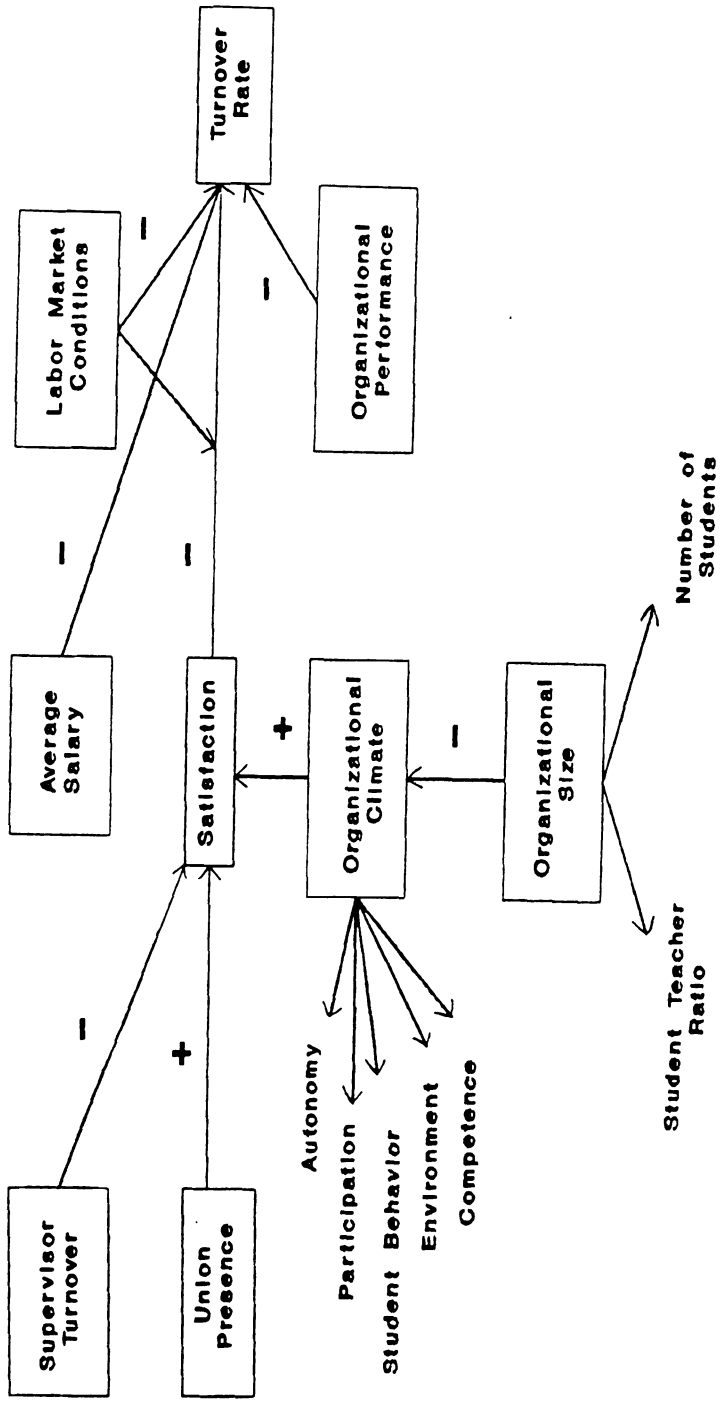
Pfeffer and his colleagues have concentrated on the study of turnover using group demography as a predictor (McCain, O'Reilly, & Pfeffer, 1983; Pfeffer, 1983; Wagner, Pfeffer, & O'Reilly, 1984). This line of research contends that demography, or more specifically, the degree of tenure similarity within a group, has an effect on the turnover rate of an organization. The results of their first study in this area indicated that turnover was higher in academic departments where either a large number of faculty members entered a department at the same time, or there were large tenure gaps between professors

(McCain, et al., 1983). Later research focused on tenure gaps within a department, contending that departments with small tenure gaps will have stronger social ties, and consequently lower rates of turnover. Wagner et al. (1984) tested this hypothesis, and found that turnover rate was positively related to the magnitude of the tenure gap. The research in this area to date indicates that the demographic characteristics of a group may be a useful predictor of turnover.

Studies that have examined individual level turnover, and the research at the organizational level led to the proposed model of organizational level turnover depicted in Figure 2. A number of organizational-level constructs can be found in Figure 2 including union presence, average teacher salary, organizational size, organizational performance, supervisor turnover, and turnover rate. Two constructs, organizational climate and satisfaction, are aggregates of individual-level responses, and arguments are made that both of these can also be considered organizational-level constructs. To demonstrate that these constructs can be considered at the organizational level, both theoretical support and statistical evidence are presented. Theoretical support for these constructs is discussed in the introduction. Statistical evidence such as obtaining perceptual agreement within an

Figure 2

Proposed Model of Organizational Level Turnover



organization and the use of composition modeling are discussed later in the method section. The final model component, labor market conditions, is included as an environmental or economic predictor. Arguments supporting the inclusion of each of these constructs in the model are presented in the following sections. The signs above the paths in Figure 2 indicate the hypothesized direction of the relationships in the model.

Economic Correlates

Labor Market Conditions. Several studies at the organizational level of analysis have examined the relationship between labor market conditions and turnover. Eagly (1965) reported a correlation of -.84 between the quit rate and unemployment over a period of 31 years (1931 to 1962). More recently, Terborg and Lee (1984) examined the relationship between objective measures of labor market conditions and turnover, and found that the labor market indicators (i.e., monthly local unemployment figures for nonfarm workers, help wanted index in the Conference Board periodical) were significant predictors of turnover (Terborg & Lee, 1984).

Although research at both the individual and organizational level of analysis have found that labor market conditions are correlated with subsequent turnover, Muchinsky and Morrow (1980) caution researchers against assuming that economic conditions will have the highest

correlations with turnover. They contend that differences have been found in turnover rates within industry and within location, suggesting that other factors also have an effect on turnover rates.

The research discussed above suggests that the labor market has a direct effect on turnover rate. Individual-level research has also suggested that labor market conditions may moderate the relationship between satisfaction and turnover rate (Carsten & Spector, 1987). However, this relationship has not been examined at the organizational level. In fact, none of the studies that examined the turnover construct at the organizational level included all three of these variables (i.e., labor market conditions, satisfaction, and turnover rate). Conceptually, it makes sense that the relationship between satisfaction and turnover rate would be stronger when unemployment is low, and jobs are more easily found. The literature supports a direct path from labor market conditions to turnover rate, and this is the link that is being hypothesized, but the use of labor market conditions as a moderator variable will also be investigated in this study.

One other link that could be proposed is one between labor market conditions and supervisor turnover. However, supervisor turnover is being conceptualized as a construct that takes place over a number of years. The condition of

the labor market has the potential to change over time; thus the link between labor market condition and supervisor turnover is not being hypothesized.

Organizational Correlates

Organizational Size. Findings concerning the relationship between organizational size and turnover at both the individual level and the organizational-level of analysis have been inconsistent. For instance, Terborg and Lee (1984) found that the relationship between organizational size and turnover rate approached significance for two samples over one time period. However, size was unrelated to turnover for the same two samples during another time period. Furthermore, Price (1977) stated that the relationship between organizational size and turnover has been found to be negative, positive, and nonsignificant. Because of the inconsistency of the relationship between size and turnover, a direct link between these variables is not being proposed.

However, an indirect relationship between organizational size and turnover, mediated by climate and satisfaction, will be examined in this study. Larger organizations have been characterized as more bureaucratic, compliant, alienated, suspicious, and as having employees who are less committed (March & Simon, 1958; Payne & Pugh, 1976). Furthermore, Joyce and Slocum (1979) suggest that size is one variable that can have a

potential effect on the way the climate of an organization is perceived. For instance, George and Bishop (1971) suggested that an increase in the size of schools results in lowered amounts of participatory decision making and authority. Empirically, the relationship between organizational size and climate was examined by Indik (1965). Indik (1965) examined four mediation models, three of which included a measure of organizational climate. The three measures of organizational climate were the perceived amount of communication with other workers, the perceived amount of higher-level interpersonal control, and the perceived degree of internal coordination of activities. Indik (1965) found that size had a negative effect on the amount of communication within the organization (which included items regarding freedom to discuss personal problems with superior and the amount of information provided and received by the employee). He also found that an increase in the size of the organization resulted in less coordination of activities within the organization. The relationship between size and amount of higher-level interpersonal control was not significant. Although size did not affect the interpersonal control climate measure, this study does provide support for the hypothesis that size may have a negative effect on climate perceptions.

One assumption being made in this proposal is that organizational size has an effect on some objective structural variables, while other structural variables, such as specialization, will be fairly similar across organizations because of the sample being used in this study (i.e., teachers in secondary schools). Although this study is not measuring objective structural variables, two perceptual variables that are usually labeled as structural are being studied. More specifically, it is hypothesized that two climate dimensions (participation in decision making and degree of authority) along with other climate dimensions will mediate the relationship between organizational size and affective constructs.

Supervisor Turnover. Research at the individual level suggests that the relationship an employee has with a supervisor is an important predictor of satisfaction in the turnover process (e.g., Williams & Hazer, 1986). A similar measure at the organizational-level of analysis might be obtained by averaging the perceptions of subordinates within an organization about their relationships with their supervisors. One assumption underlying this type of measure is that supervisors treat all of their subordinates alike (Graen & Cashman, 1975). However, research conducted on the vertical dyad linkage model has shown that a supervisor's relationship with

subordinates differs from one subordinate to another (Dansereau, Cashman, & Graen, 1973; Dansereau, Graen, & Haga, 1975). In other words, subordinates within the same work group report differential treatment from the work group supervisor (Dansereau, Cashman, & Graen, 1973; Dansereau, Graen, & Haga, 1975). Thus, the relationship between leaders and their subordinates appears to be a dyadic one (Ferris, 1985; Graen, Liden, & Hoel, 1982), and this research indicates that an averaged measure of leader-subordinate relations may not be the most appropriate measure to use at the organizational-level of analysis.

A measure that might be used in place of averaged leader-subordinate relations responses is the frequency of supervisor turnover. This measure would not be isomorphic with the individual-level construct, but would most likely have an effect on the leader-subordinate relations within an organization. For instance, it would be difficult to form any type of stable relationship with a supervisor if the person in that position was constantly changing. In addition, Price (1977) asserts that a high degree of managerial turnover results in higher amounts of formalization, or making organizational norms (as the new manager perceives them) more explicit. A workplace in which the rules or procedures are often changing could become confusing which in turn could lead to decreased

satisfaction. Research discussed earlier provided support for the contention that supervisor turnover leads to an increase in new rules and procedures (Carlson, 1962; Grusky, 1959). It should be noted that some of the variables in Figure 2 may also have had a similar effect on supervisor turnover. However, these links are not being considered in this proposal.

Average Salary. The proposed model suggests that salary has a direct effect on turnover. Katzell, Barrett and Parker (1961) examined the relationship between turnover and wage rate for a group of 72 divisions within an organization. The authors of this group-level analysis found a significant negative correlation between wage rate and turnover (r=-.32). Additionally, these researchers looked at the relationship between wage rate and a number of satisfaction questionnaire items (n = 47 items) within division. They again found significant correlations between wage rate and 25 of the satisfaction items (mean r = -.32). Finally, the satisfaction items were not found to be related to turnover at the division level.

Wales (1970) examined the relationship between salary and turnover at the organizational-level of analysis. He used a model that combined cross-sectional and time-series data to examine the influence of different variables on turnover rates in a sample of eighteen industries. The results indicated that there was a significant negative

relationship between salary and turnover rates. Other significant correlates of turnover rates were unemployment rate, unionization, age, and gender. Wage rate was most highly related to turnover in this study.

The proposed model in Figure 2 started with the relationship between salary and turnover being mediated by satisfaction, because researchers have suggested that this relationship should be mediated by job attitudes (Lawler, 1981; Steers & Mowday, 1981). However, the empirical evidence at the division and organizational levels does not support this contention. In fact, both of the aforementioned studies provide support for a direct link between salary and actual turnover.

Union Presence. There has not been much research on the relationship between union presence and turnover rate to date in the literature, and the research that does exist has produced mixed results. Three studies have been conducted that examine this relationship, and each one has found different results. Wales (1970) reported that there was a relationship between the two constructs, but that the relationship was moderated by unemployment rate. Longest and Clawson (1974) found that unionization was a direct negative predictor, and accounted for a significant amount of variance in turnover rates, and finally, Newton, Betcherman, and Leckie (1981) reported a nonsignificant relationship between unionization and turnover rate.

One possible reason for these mixed findings is that a different measure of unionization was used in each study. Wales' (1970) measure of unionization was the percentage of individuals within an organization that were unionized. The measure used by Longest and Clawson (1974) was the existence of a grievance procedure, and Newton et al. (1981) used a dichotomous measure of unionized versus not unionized.

Results of research on the effect of union presence in the turnover process have been inconsistent, so it may be necessary to explore the role of this construct in the model. However, in the present study, I am hypothesizing that union presence will have an indirect effect on turnover, mediated by satisfaction. This relationship was supported by research at the individual level of analysis. As mentioned earlier, the individual-level research suggests that the effect of union presence on satisfaction is negative, because of the type of job involved, and the fact that unions heighten the employees' awareness of unsatisfactory working conditions. However, because of the sample being used in this study (i.e., secondary school teachers), it is hypothesized that the presence of a union will have a positive effect on satisfaction for the following three reasons. First, the type of job is unlikely to be a factor because the job is fairly similar across the sample. Additionally, it would

seem that teachers would be aware of unsatisfactory working conditions whether or not a union was present. This may also be true in other occupations, although Borajas (1979) and Farber (1980) predicted the presence of a union would result in workers becoming more aware of poor working conditions. Finally, the presence of a union may make the teachers feel that their jobs are more secure, their pay is more equitable, and that they have the ability to take action to improve working conditions.

Organizational Performance. Organizational performance is another exogenous variable that is proposed to have a direct effect on turnover. Organizational performance can be defined as the level of performance that the participants of the organization have achieved. Some empirical support for this contention was located in a study in which the researchers examined the relationship between turnover and organizational demography in a top management sample of 31 Fortune 500 companies (Wagner, Pfeffer, & O'Reilly, 1984). They included a measure of organizational performance as a control variable in this study. This measure was average return on investments (ROI) corrected so that industry type would not affect the ROI. When entered into a regression analysis, this measure of performance was found to be a significant predictor of turnover rate. It is possible that the relationship between performance and turnover may be

reversed; that turnover may predict organizational performance, but this hypothesis will not be considered in this research.

Organizational Climate. The history of the climate construct has been one fraught with debate. Two of the topics of debate include the definition of organizational climate, and whether climate and satisfaction represent the same construct. This section will attempt to address these topics, and then explains how organizational climate fits into the proposed model.

Individual climate is typically defined as a person's perceptions of a specified context, such as the work group or the organization, in which he/she is a participant (Rousseau, 1988). However, the definition of organizational climate has generated considerable controversy. James and his colleagues conceptualize organizational climate as an aggregate of individual-level climate perceptions (James, 1982; James, Joyce & Slocum, 1988). When perceptual agreement is demonstrated, the aggregate of these individual-level perceptions represents a "shared assignment of meaning" (James et al., 1988, p. 129), or organizational climate. In contrast, Glick (1985; 1988) conceptualizes organizational climate as an organizational-level construct (similar to structure), and not a perceptual construct (Rousseau, 1988). Glick (1985) contends that individuals may have inaccurate perceptions

of the organization's climate, and suggests that the organization should be the unit of analysis. Furthermore, Glick (1985) argues that instead of just aggregating individual responses, a sample should include different types of organizations, and researchers should use multiple sources of information to ensure that the measurement of climate is valid. Rousseau (1988) indicated in her review of the literature that Glick's understanding of organizational climate does not fit with other models that conceptualize organizational climate as a cognitive construct.

Climate conceptualized at the organizational level as a cognitive construct reflects the shared perceptions of the organizational members of the context or setting in which they work (Rousseau, 1988). According to Rousseau (1988), the assumption underlying the aggregation of individual-level climate responses is that units or organizations have different climates. Empirically, one can demonstrate that organizations have unique climates by examining the between-unit differences of aggregated climate responses (Rousseau, 1988).

Joyce and Slocum (1984) discuss a different method to use when aggregating climate perceptions. They refer to aggregated climate perceptions as "collective climate". They suggest clustering individuals on the basis of the similarity of their responses to the climate measure, or

profile similarity. This means that the criteria used to cluster individuals is agreement on climate perceptions. When using this method, employees do not have to be in the same work group or division to be clustered together; the main criterion is perceptual agreement. This conceptualization of climate is somewhat different from that of Schneider (1987) and Rousseau (1988) who suggest that because units within an organization (e.g., work groups or divisions) share common experiences, they will have similar climate perceptions. However, Rousseau (1988) also notes that employee interactions are thought to be important in collective climate formation. At least two studies have been conducted using this clustering technique, and the results of the studies provide support for this technique (Jackofsky & Slocum, 1988; Joyce & Slocum, 1984).

When defining the organizational climate construct, one also must consider whether the construct is a general summary measure of what occurs in the organization, or as a multi-dimensional construct. At the individual-level of analysis, some researchers have used summary measures of organizational climate (e.g., Drexler, 1977), but most have used a variety of climate scales (e.g., supervisor support) to measure the construct (e.g., Kozlowski & Doherty, 1989; Schneider & Snyder, 1975). Drexler (1977) noted that he used a summary measure of climate because of

the high intercorrelations between the various climate scales. A summary measure of climate was used in the only current organizational-level study that included climate as a predictor (Terborg & Lee, 1984). One current view is that the use of various scales is more informative because it provides the research with more precision (Rousseau, 1988).

Additionally, the definition of a construct should include a statement of how the construct differs from other similar constructs. Guion (1973) expressed concern that organizational climate and satisfaction were both measuring the same construct. Later individual-level studies suggested that climate and satisfaction are distinct concepts if they are conceptualized and measured as separate constructs (LaFollette & Sims, 1975; Schneider & Snyder, 1975; Woodman & King, 1978). Joyce and Slocum (1979) noted that although the measurement of these two constructs may at times be similar, the conceptualization of the two constructs are not the same. The climate of a work group or organization should be conceptualized as a description of the activities that occur within the work area. In contrast, satisfaction is the affective response to that work area.

One other question that might be asked is why we would expect organizations to have different climates. Schneider (1987) would argue that climates differ across

organizations because of the individuals within the organizations. In fact, Joyce and Slocum (1979) state that "organizations have climates in the same way that individuals have personalities" (p. 333). The contention of Schneider (Schneider, 1987; Schneider & Reichers, 1983) is that the climate within an organization forms through an attraction-selection-attrition (ASA) process. More specifically, individuals choose organizations or jobs to which they are attracted. In addition, organizations attempt to select individuals who seem to have goals and attitudes that are similar to those the organization expects. The ASA approach also suggests that when individuals are hired who do not have the same beliefs and views about the organization, or do not fit into the work group, they leave the organization. As Schneider (1987) stated "... people who don't fit an environment well will tend to leave it" (p. 442). Furthermore, Kozlowski and Hults (1987) assert that individuals within an organization will have similar climate perceptions because of the interaction and socialization processes that take place within the organization.

Now that the definition of organizational climate has been discussed, the next section will address how the construct fits into the proposed model. First the composition of the proposed climate construct will be discussed, followed by an attempt to justify the proposed

paths in the model as well as one path that is not being proposed.

As mentioned earlier, researchers have usually conceptualized the climate construct as consisting of a number of different dimensions. However, the dimensions used in research often differ from one study to another. There are a number of dimensions that could be of interest in the present study. The specific dimensions that are being used in the present study are coworker competence, degree of autonomy, participation in decision making, physical environment, and student behavior. Each of these dimensions will be briefly defined in terms of the sample being studied (secondary school teachers) before discussing the way in which they relate to other constructs. Coworker competence is defined as the degree to which teachers help students learn. The degree of autonomy consists of the teachers' perceptions of the degree to which a supervisor's approval is necessary in order for a decision to be made. The participation dimension assesses the degree to which teachers perceive that they participate in school decisions. The physical environment is defined as the safety and neatness of the school, and the final dimension, student behavior, assesses the way in which students behave and work.

Each of the climate dimensions are hypothesized to have an effect on satisfaction. Furthermore, three of the

dimensions (coworker competence, autonomy, and participation) have been studied in the climate literature, and have been shown to be related to affective variables (e.g., Pritchard & Karasick, 1973; Jackofsky & Slocum, 1988). The physical environment and student behavior dimensions are particularly important because of the sample under study (i.e., secondary schools). The environment and the student behavior would be important to teachers who interact with students on a regular basis. In fact, Newman (1977) did find a significant relationship between some physical environment dimensions and satisfaction at the individual-level of analysis. Student behavior as a climate dimension has not been specifically studied as a correlate of affective variables, but it is similar to other climate dimensions that have been studied (e.g., supportiveness, peer relations). In Figure 2, the five climate dimensions are represented as indicators of organizational climate.

As mentioned earlier, the inclusion of the climate construct in turnover research at the individual level has occurred only recently. The results of this research has suggested that climate is an important part of the turnover process. At the organizational level, it has been hypothesized that turnover will be influenced by different climate dimensions such as centralization and participation (Mobley, 1982a; Price, 1977; Terborg & Lee,

1984). One study was found in which the researchers did examine the relationship between organizational climate and turnover rate, but their findings were mixed. Their results were different for different samples (management and sales personnel), and the results also differed across time periods for the same samples (Terborg & Lee, 1984). Research at the individual-level of analysis, along with the inconclusive results reported by Terborg and Lee (1984) suggests that the proposed climate dimensions may also make a contribution at the organizational-level of analysis. Thus, it is hypothesized that organizational climate will have an indirect effect on turnover rate, mediated by satisfaction.

One other possible link that should be considered in this study is the path between organizational climate and organizational performance. Researchers have reported different levels of relationship between climate and performance at the individual and organizational levels. At the individual level, some researchers have found that climate was related to performance (e.g., LaFollette & Sims, 1975). However, Jackofsky and Slocum (1988) examined this relationship over two time periods and found no relationship between the two constructs at time 1. However, a significant relationship was reported during the second measurement period.

At the unit or organizational level, empirical evaluation of this relationship has also produced inconsistent results. Pritchard and Karasick (1973) found that climate was related to subunit performance. In contrast, Schneider and Snyder (1975) reported that climate was not strongly related to production data. The results of a third study indicated that the relationship between organizational performance data and climate was negative (Heller, Guastello & Aderman, 1982). Because of the generally discouraging results of studies of this relationship, no path between climate and organizational performance is being hypothesized.

Work-Related Correlates

Satisfaction. Although employee satisfaction is usually perceived to be an individual-level variable, the aggregation of satisfaction to the organizational level is based on the assumption that the affective reactions of employees in general to various aspects of their work place differ across organizations. For instance, employees as a group in one organization could report being more or less satisfied than employees in another organization.

James, et al. (1988) argue that an organization cannot have an attitude. This statement may be understood to mean that researchers should not aggregate affective constructs such as satisfaction, although other

researchers do discuss organizational-level affective constructs (e.g., Angle & Perry, 1981; Staw, 1980). However, aggregated affective variables are conceptualized in this paper, not as an organizational attitude, but as a description of the feelings that employees have in general in one organization as compared to employees' attitudes in general in another organization.

The relationship between job satisfaction and turnover has not yet been examined at the organizational-level of analysis, but has been studied at the group or division level. Two studies that have examined this relationship at the group level reported that the relationship was nonsignificant (Kerr, Koppelmeier, & Sullivan, 1951; Katzell, Barrett, & Parker, 1961). However, the literature clearly supports this relationship at the individual-level of analysis. Furthermore, the group-level findings are based on only two studies, neither of which attempted to evaluate statistically whether the constructs could be considered group-level constructs. Thus, this study includes a path from average satisfaction to turnover.

Dependent Variable

Turnover Rate. The only variable in the proposed model that has not been discussed is the turnover rate. Muchinsky and Tuttle (1979) stress the importance of reporting the type of turnover measure used in research

because of the large number of turnover measures available; Gaudet (1960) describes 25 turnover measures. There are measures which focus on length of service, voluntary turnover, dismissals, the number of new workers hired, and individuals who stay with the organization (Gaudet, 1960; Price, 1977). A description of the various types of turnover measures can be found elsewhere (Gaudet, 1960; Price, 1977). Muchinsky and Tuttle (1979) report that some form of a yearly percentage rate is usually found in turnover research.

The proposed research uses what Price (1977) labels the instability rate which is the number of workers who have voluntarily left the organization divided by the total number of individuals who were employed at the beginning of the measurement period. This measure will be used for two reasons. The focus of this research is to understand the determinants of organizational turnover, thus all individuals who have voluntarily left should be included in our measure, not the workers that were fired or just the newcomers. More importantly though, the use of this measure will make the results more readily comparable to others that have used this type of measure (e.g., Terborg & Lee, 1984).

Although researchers have made a distinction between functional and dysfunctional turnover, this distinction is still exploratory. This study will focus on turnover

frequency, and for the present, ignore the functional aspect of turnover. However, it would be interesting to evaluate the relationships proposed in Figure 2 and a measure of functional turnover in a later study.

Hypotheses

The relationships suggested in Figure 2 represent the major hypotheses of this proposal. Each of the hypothesized relationships in Figure 2 will be presented beginning with the constructs that are shown to have direct effects on actual turnover.

H1: Labor market conditions, salary, performance, and satisfaction each will have a direct negative effect on turnover rate.

H2: Climate will have an indirect effect on turnover. Satisfaction will mediate the indirect relationship between climate and turnover. The relationship between climate and satisfaction will be positive.

H3: Satisfaction will mediate the relationship between union presence and turnover. The relationship between union presence and satisfaction will be positive.

H4: Satisfaction will mediate the relationship between supervisor turnover and turnover. The relationship between supervisor turnover and satisfaction will be negative.

H5: Organizational size will have an indirect effect on turnover mediated by organizational climate and satisfaction. The relationship between organizational size and climate will be negative.

H6: Labor market conditions may moderate the relationship between satisfaction and turnover rate. When labor market conditions are positive (unemployment rate is low), the relationship between satisfaction and turnover will be stronger than when labor market conditions are negative (unemployment rate is high).

METHOD

The data for this study were collected as part of a larger research project. In 1985, a conceptual model was developed to examine the determinants of school effectiveness by the National Association of Secondary School Principals (NASSP). An initial pilot study was conducted to examine the model (Schmitt & Ostroff, 1987), and the results from the pilot were used to revise the initial measures. The data for the present study along with other information were collected to examine how well the revised instruments measured the specific model components and to test the NASSP school effectiveness model. The results of the larger project can be found in Schmitt and Doherty (1988).

Sample

Three hundred and sixty four schools from 36 states and Canada were used in the Schmitt and Doherty (1988) study. These schools were contacted to provided further information for the present study. From that group of schools, 188 of the schools provided usable information, and were used in the present study. There were 41 schools (21.8%) that were junior-high schools, 126 (67.0%) that were at the senior-high level, and 21 schools (11.2%) that

reported having both junior and senior-high students. The school principal and teacher samples as well as the questionnaires used are described in the following sections.

Principals. The principal from each of the 188 schools was asked to respond to a two-part questionnaire. The first part of the questionnaire was in multiple-choice format, and the second part of the questionnaire consisted of open-ended questions. The information that was obtained from the principal questionnaires is the size of the organization, organizational performance, supervisor turnover, and average teacher salary. These items can be found in Appendix A. Demographic information on the principals can be found in Table 2.

Teachers. The teacher sample consisted of 7,691 teachers from the 188 schools. The number of teacher respondents per school ranged from 12 to 86 with a mean number of teachers being 51.08 (standard deviation = 26.14). Teachers were not asked to provide demographic information, but were asked to respond to questions regarding school climate and satisfaction. Each of these items grouped by scale can be found in Appendix B.

Table 2

Demographic Characteristics of Principal Sample[1]

Gender	
Male	92.0%
Female	8.0%
Ethnic Status	
Asian American	1.1%
Black	3.7%
Hispanic	.5%
White	94.7%
Tenure	
Less than 1 year	9.0%
More than 1 year, but less than 2	11.2%
More than 2 years, but less than 3	13.8%
More than 3 years, but less than 4	6.9%
More than 4 years, but less than 5	6.4%
More than 5 years, but less than 8	16.5%
8 or more years	36.2%

[1] Sample Size = 188

Measures

Organizational Size. Principals provided this information by responding to an open-ended question which asked the principals to report the number of students enrolled in their school. A second measure of organizational size was computed by dividing the number of students in the school by the number of full-time equivalent teachers to get a measure of the student-teacher ratio in the school.

Organizational Performance. This variable was operationalized by using student achievement measures on standardized tests. The principal was asked to report test information by grade on reading comprehension, arithmetic, and science for grades 6 through 12. For each grade level in the school, the principal was asked to provide the type of test used (e.g., California Achievement Test), the actual score for the grade, and whether the score reported was an average percentile or an average normalized curve equivalent score (NCES). When the data were received, all of the NCES scores were converted into percentile scores. The three achievement variables were combined into a composite measure of performance since the intercorrelations between the variables were relatively substantial ($r > .78$).

Additionally, research has shown that student achievement is affected by social economic status (SES). Thus, a measure of SES was first partialled out of the relationships with the student achievement measure. The SES variable used was the percentage of students in the school that received free or reduced-price lunches. After lunch was partialled out of the relationships between the three achievement measures, the intercorrelations between these variables was still greater than .74.

Supervisor Turnover. This measure was obtained by asking the principal to report the number of principals or headmasters that have served in the school in the past decade.

Average Teacher Salary. This was obtained with an open-ended question that asked the principal to report the average teacher salary in the school for the year that the data were collected. Average teacher salaries ranged from 18,800 to 44,000 by state across the country, so this measure was corrected by area of the country. This was done by assigning the average state salary to each school in the sample. The average state salary was then partialled out of the relationships between salary and other constructs. Appendix C contains the average teacher salaries by state.

Union Presence. This measure was obtained by asking the principal to report the percentage of the teachers in the school that were unionized. This percentage was used as the measure of union presence.

School Climate. Teachers reported their perceptions of five dimensions of school climate. The dimensions used were coworker competence, physical environment, student behavior, participation in decision making, and degree of autonomy. If these climate dimensions are highly correlated, they will be combined into one measure of organizational climate. The items in the first three dimensions were taken from a larger group of items used in the Schmitt and Ostroff (1987) pilot study. Most of the items in this larger group of climate items were obtained from the NASSP Climate Survey (Kelly, Glover, Keefe, Halderson, Sorenson & Speth, 1986). As mentioned earlier, the results of the Schmitt and Ostroff (1987) study were used to revise the measures used in the survey in this study. Schmitt and Ostroff (1987) had used ten climate dimensions to assess school climate, and found that the climate dimensions were highly intercorrelated. In an attempt to reduce the number of items in the survey, they selected the climate item from each dimension that had the highest item-total correlation with its dimension. These items were used in the present study to measure school

climate. However, upon examination of the items chosen by Schmitt and Ostroff (1987), I felt the items could be grouped into three dimensions by item content (i.e., coworker competence, physical environment, and student behavior). The competence dimension consists of four items regarding how teachers help students learn. The physical environment dimension consists of two items regarding the safety and neatness of the school. The third dimension, student behavior, includes three items which asked about the way students behave and work. Teachers were asked to respond to these items by stating the degree to which most individuals in the school or community would agree with the items. The possible responses ranged from strongly disagree (1) to strongly agree (5).

The last two climate dimensions were also used in the Schmitt and Ostroff (1987) study. The participation in decision-making dimension included four items which assessed the frequency of teacher participation in four types of school decisions (Hage & Aiken, 1967). The coefficient alpha for this scale was .76 in the pilot study (Schmitt & Ostroff, 1987). The possible responses for the scale ranged from never (0) to always (4).

The final climate dimension, degree of autonomy, consisted of five items used to determine the teachers'

perceptions of the degree to which a supervisor's approval is necessary in order for a decision to be made (Hage & Aiken, 1967). Schmitt and Ostroff (1987) reported finding a coefficient alpha of .91 for this scale. Possible responses ranged from definitely false (0) to definitely true (4).

Satisfaction. The satisfaction items were chosen by Schmitt and Ostroff (1987) in the same way they selected the climate items. In the pilot study, nine scales were used to assess various satisfaction dimensions. In an attempt to be more parsimonious, the best items from these scales were chosen. The result was a nine-item scale that assessed the teachers' satisfaction with different aspects of the school. The scale responses ranged from very dissatisfied (1) to very satisfied (5).

Labor Market Conditions. There are a variety of ways that labor market conditions can be operationalized for this sample. The best measure would be teacher unemployment by state, but attempts to locate this type of measure were unsuccessful. Instead, two other measures were selected. The first was a measure that was obtained from a publication entitled "Geographic Profile of Employment and Unemployment, 1987" (U. S. Bureau of Labor Statistics, 1988). In this table, employment and unemployment statistics were provided for different

occupational groups. The group that was appropriate for teachers was the professional specialty group. The numbers reported in Appendix D are unemployment rates (in thousands) for the professional specialty group.

A second measure that was used is an annual report written by James N. Akin (1989) which provided supply/demand ratings for both secondary and elementary school teachers by region of the country. This measure was obtained by sending surveys to 502 teacher placement officers in December of 1987. The placement officers were asked to indicate their perceptions of current and future teacher employment opportunities. Out of the 502 surveys, 247 (49%) were returned. The continental United States were divided into nine areas, and Hawaii and Alaska were considered separate areas. The responses of the placement officers were collapsed within an area of the country. No information was provided on the number of placement officers responding in each of the areas of the country. Additionally, interrater reliability analyses were not reported. Thus, there is no indication of the degree of agreement between placement officers within the areas of the country. The supply/demand ratings can be found in Appendix E. If the school was a junior high school, the secondary elementary school ratings were used. However, if the school was a senior high school or a combined

junior-senior high school, the average ratings at the bottom of the table were used. Thus, the school was assigned one of ten ratings depending on the level of the school and the area of the country in which the school was located.

Turnover Rate. As mentioned in the introduction, there are a number of different measures of turnover. The measure chosen in the proposed research for reasons discussed earlier is the number of workers who had left the organization divided by the total number of individuals who were employed at the beginning of the measurement period.

In the fall of 1987, principals provided information on the number of teacher full-time equivalents (FTEs) employed at their schools. The measure of actual turnover was obtained from principals. In early 1990, principals were asked to provide information on the number of teacher FTEs who were employed in the fall of 1987, and who had subsequently left the school (during the 1988-89 school year). The principals were asked to include only those teachers who voluntarily left the school. Because it is being suggested that the various constructs be used to predict turnover rates, there should be a period of time that intervenes between the collection of the predictor data and the collection of the criterion. This measure

can be found in Appendix F. The measure also asked principals to provide ratings of their teachers' skills and abilities, but these ratings were not used in this research.

Measurement Issues

Three major issues that need to be addressed in a study such as this are levels of analysis, potential method bias, and the effect of unmeasured variables on the evaluation of the proposed model. Each of these issues is discussed.

Levels of Analysis Issues

Levels of analysis research often includes variables that have been aggregated to represent a higher-level construct. When researchers do aggregate variables to a higher level, they should provide support for the conceptualization of a variable as a higher-level construct.

Composition Modeling. One method that provides evidence that constructs can be considered higher level variables is the use of composition modeling. A composition model must include constructs that exist at more than one organizational level. In other words, constructs that can be measured at one level seem to exist in a similar form at another level. Ostroff and Kozlowski (1986) contend that when developing a composition model,

adjacent levels in the organizational hierarchy should be used (e.g., individual and group) in the model. In other words, levels should not be omitted from the hierarchy. However, organizations do exist (e.g., small businesses, pre-college schools) in which the individuals at the group level and those at the organizational level are the same persons.

When describing the degree of similarity between a construct at one level and the construct at another level, researchers use the term isomorphic. It is necessary to satisfy three criteria in order to demonstrate the isomorphism of different forms of a construct. First, a construct that exists at more than one level may be considered the same construct if the definitions are similar (James, 1982). Second, the relationships between potential isomorphic constructs at one level must be similar to the relationships between the same constructs at another level (Rousseau, 1984). For example, if the relationship between climate and satisfaction at the individual level is a moderate, positive correlation, then the relationship between climate and satisfaction at the unit level must also be moderate and positive in order for both climate and satisfaction to be considered isomorphic constructs. The final criterion is only important when aggregation is necessary. According to James (1982),

perceptual agreement must be demonstrated before a higher level construct may be considered to be equivalent to a lower level construct. Aggregation and perceptual agreement are integral issues in levels of analysis research so each of these is discussed in further detail.

Aggregation. One potential problem when attempting to develop a composition model is that often lower level variables must be aggregated to form higher level variables because of the nature of the constructs. For instance, the usual method used to find out the satisfaction level of a group of people is to aggregate individual satisfaction responses. However, researchers have argued that "global (indivisible) data" are more appropriate to use than aggregate data (Roberts, et al., 1978; Rousseau, 1985). An example of a global satisfaction variable may be an item that requires a unit supervisor to report his or her perception of the satisfaction of the unit. Researchers suggest that aggregate data may be ambiguous and misleading because it is not obtained directly from the level to which it is attached (Roberts, et al., 1978; Rousseau, 1985). However, because of the nature of some variables, the most representative and practical method to use when examining a higher-level variable (e.g., satisfaction) is aggregation. Asking a supervisor for his/her perception

of the satisfaction level in the group can be very misleading if the supervisor's perception is incorrect, or if there is reason for them to distort their responses. To illustrate, Kerr (1947) obtained a departmental morale rating from the personnel manager and another joint rating of departmental morale from a vice president and the union president of a company. Kerr (1947) then correlated these ratings with the turnover rate of the department. The results of his analysis indicated that the correlation between the personnel manager's rating and turnover was -.02, while the correlation between the joint rating and turnover was -.44. These results show that different individuals in a company can have different perceptions of departmental morale. Even though some variables, such as satisfaction, may be best examined by aggregating individual responses, care must be taken to ensure that perceptual agreement exists, and that the data is not contaminated by problems such as method bias. In this study, the variables that are aggregates of individual-level constructs are climate and satisfaction.

Rousseau (1985) also contends that when constructs will be aggregated to a higher level, the items used to measure those constructs should be worded at the level to which they will be aggregated. For instance, when aggregating climate to the group level, respondents should

be asked about group perceptions of climate. In the present study, the climate items were asked at the organizational level, but the satisfaction items were asked at the individual level.

Perceptual Agreement. According to James, et al. (1988), if employees within an organization have similar perceptions of a construct (e.g., climate), aggregation is possible because this agreement "implies a shared assignment of meaning" (p. 129). An aggregated construct is a measure of the responses of the employees in general. The aggregation of these individual-level variables also indicates that the researcher is contending that various units or organizations can have differing amounts or levels of these constructs. In essence, organizations as a whole have employees with different degrees or perceptions of climate and satisfaction that range along a continuum. Researchers that examine levels of analysis issues argue that before a construct is aggregated, agreement within the organization must be demonstrated (James, 1982). This agreement within an organization is an indication that employees share similar perceptions regarding the construct for which agreement has been demonstrated. One way to assess agreement within an organization is to compute eta squared which compares the within-organizational variance to the

between-organizational variance of the construct. For example, Zohar (1980) compared the variance of climate scores within factories to the variance of scores between factories to determine if the climate scores within the factories were homogeneous. The results of his analysis of variance were significant, and he concluded that the climate perceptions of workers within each factory were similar. While researchers have not specified an acceptable level of eta squared, James (1982) stated that the median eta squared reported in the literature is .12. For each aggregated variable in the model, an eta squared was calculated to assess agreement.

Specification of Levels of Measurement and Analysis. There are two types of levels that should be specified in any study in which level is an issue. The level of measurement refers to the level from which the data were obtained. The level of analysis refers to the level to which the data are assigned for analysis (Roberts et al., 1978; Rousseau, 1985). In this study, the unit of analysis is the school. However, the unit of measurement for the teacher scales is the individual. It was argued earlier that the teacher scales could be aggregated to the organizational level because hypotheses about the effect of these variables on organizational-level turnover rates are conceptually meaningful. Additionally, these scales

an be aggregated if individuals within an organization have similar perceptions or feelings (James, et al., 1988). The teacher scales that were aggregated were the climate dimensions and satisfaction.

Method Bias

When measuring more than one construct that is perceptual, method bias is one potential problem. There are three steps that can be used to increase the possibility that method bias has not inflated the relationship between the perceptual constructs. The first two steps occurred during the construction of the measures. The third step took place during the construction and analysis of the data set. The first step used was to ensure that the instructions and responses were clear so that the teachers understood how they should think about each question when responding. For instance, three of the climate scales stated that a description of the school from the standpoint of most individuals in the school or community was the desired response. In contrast, the directions to the satisfaction scale asked the respondents to report their feelings about various aspects of the school.

The second step that was used to attempt to control method bias is that several of the variables are quasi-objective in that the data was collected from several

sources. Specifically, the principals provided information on supervisor turnover, average salary, organizational performance, organizational size, and actual turnover, while teachers provided information on climate and satisfaction. Furthermore, one variable (labor market conditions) was obtained from a third source (e.g., library sources).

Finally, the items in all of the scales were subjected to a principal-axis factor analysis. This analysis provided information on the possibility that method bias exists. The factor analysis should yield several factors, one for each scale. If the factor analysis should result in one global factor, this will provide evidence that the subjects did not distinguish between the various constructs (Harman, 1967; Podsakoff & Organ, 1986; Kozlowski & Doherty, 1989). Method bias could be cited as one cause for subjects not being able to differentiate between constructs.

Unmeasured Variables.

Another problem with testing a model such as the one proposed is that of unmeasured variables (Billings & Wroten, 1978; James, 1980). Billings and Wroten (1978) assert that in studies they have reviewed, missing variables often may have been responsible for relationships found between other constructs. James

(1980) contends that a missing variable is not the problem, but rather that the degree to which the missing variable biases the estimates of the existing path coefficients is problematic. A missing variable need not seriously bias the existing paths. According to James (1980), a missing variable will not bias the results of a path model if the variable meets certain criteria. First, if the missing variable is highly correlated with a measured variable, the results will not be affected. Second, bias will not occur if a missing variable does account for variance in the dependent variable, but is unrelated to the other predictors in the model. This type of missing variable problem will result in the model explaining less variance in the dependent variable, but the other existing path coefficients will not be affected.

The development of causal models of turnover at the organizational level is a fairly recent addition to the turnover literature. Therefore, it is difficult to be sure that all of the important variables have been included in the model. However, one variable missing from the proposed model that has been found to be related to turnover in the literature is tenure or tenure gap. The fact that this variable is missing should not bias the other path coefficients because the relationship between tenure and turnover would have been a direct relationship.

Additionally, the correlations between tenure and the other predictors should be low or nonsignificant. Thus, the existing paths in the model will not be affected by this missing variable, but the amount of variance explained in the dependent variable will be lower than if tenure had been included.

Analysis

A number of basic statistics, such as means, standard deviations, intercorrelations between variables, and reliabilities, were computed to ensure that there are no coding or data definition problems and that the scales measure the intended constructs. Two other preliminary analyses are necessary before the hypotheses can be tested. Three of the climate dimensions were formed on a conceptual basis. A factor analysis was conducted to determine if the climate items loaded on their respective scales. The second set of analyses that were needed were the computation of eta squares for the various teacher scales to assess agreement and the appropriateness of computing aggregate statistics.

Before testing the full model in Figure 2, moderated regression was used to find out if the condition of the labor market moderates the relationship between turnover intent and turnover rate. If the results indicate that the labor market does moderate this relationship, then a

series of regressions will be used to test the model in Figure 2. If the moderated regression results are not significant, then the SPSSX program, LISREL (Joreskog & Sorbom, 1986), will be used to test the model. LISREL is a program that can be used to estimate the path coefficients in a group of linear structural equations (Joreskog & Sorbom, 1986). In order to illustrate how the proposed model was evaluated, the model is presented using matrix equations (see Table 3). Table 3 includes both the structural equation and the measurement equations. Figure 3 provides a graphic representation of the matrix equations. However, the proposed model consists of constructs that are represented by single indicators. With the exception of organizational climate and organizational performance, each construct in Figure 3 is being measured by one item or one scale. Thus, the measurement model cannot be tested by LISREL, but the measurement model equations are included for completeness. The reliability of the measures was assessed prior to testing the structural components of the model.

The first matrix equation in Table 3 represents the structural equation model, which provides information about the causal relationships between the latent variables and describes the unexplained variance. The first part of the equation represents the paths between

Table 3

Structural and Measurement Equations for the Proposed Model

Structural Model Equation - 1st Equation

$$\begin{array}{c} \\ \sum = \\ \\ \\ \end{array} \begin{array}{c} \begin{array}{cccc} & \text{CLM} & \text{SAT} & \text{AT} \end{array} \\ \begin{bmatrix} \text{CLM} \\ \text{SAT} \\ \text{AT} \end{bmatrix} \begin{bmatrix} 0 & 0 & 0 \\ \beta_1 & 0 & 0 \\ 0 & \beta_2 & 0 \end{bmatrix} \end{array} \begin{bmatrix} \text{CLM} \\ \text{SAT} \\ \text{AT} \end{bmatrix}$$

$$\begin{array}{c} \begin{array}{cccccc} & \text{SZ} & \text{SAL} & \text{PRF} & \text{STO} & \text{UP} & \text{LMC} \end{array} \\ \begin{bmatrix} \text{CLM} \\ \text{SAT} \\ \text{AT} \end{bmatrix} \begin{bmatrix} \gamma_1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \gamma_4 & \gamma_5 & 0 \\ 0 & \gamma_2 & \gamma_3 & 0 & 0 & \gamma_6 \end{bmatrix} \end{array} \begin{bmatrix} \text{SZ} \\ \text{SAL} \\ \text{PRF} \\ \text{STO} \\ \text{UP} \\ \text{LMC} \end{bmatrix} + \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \end{bmatrix}$$

[1] CLM = Climate, SAT = Satisfaction, AT = Actual Turnover, SZ = Organizational Size, SAL = Salary, PRF = Organizational Performance, STO = Supervisor Turnover, UP = Union Presence, LMC = Labor Market Conditions.

Table 3 (cont'd)

Structural and Measurement Equations for the Proposed Model

Measurement Model Equations

(Endogenous Variables - 2nd Equation)

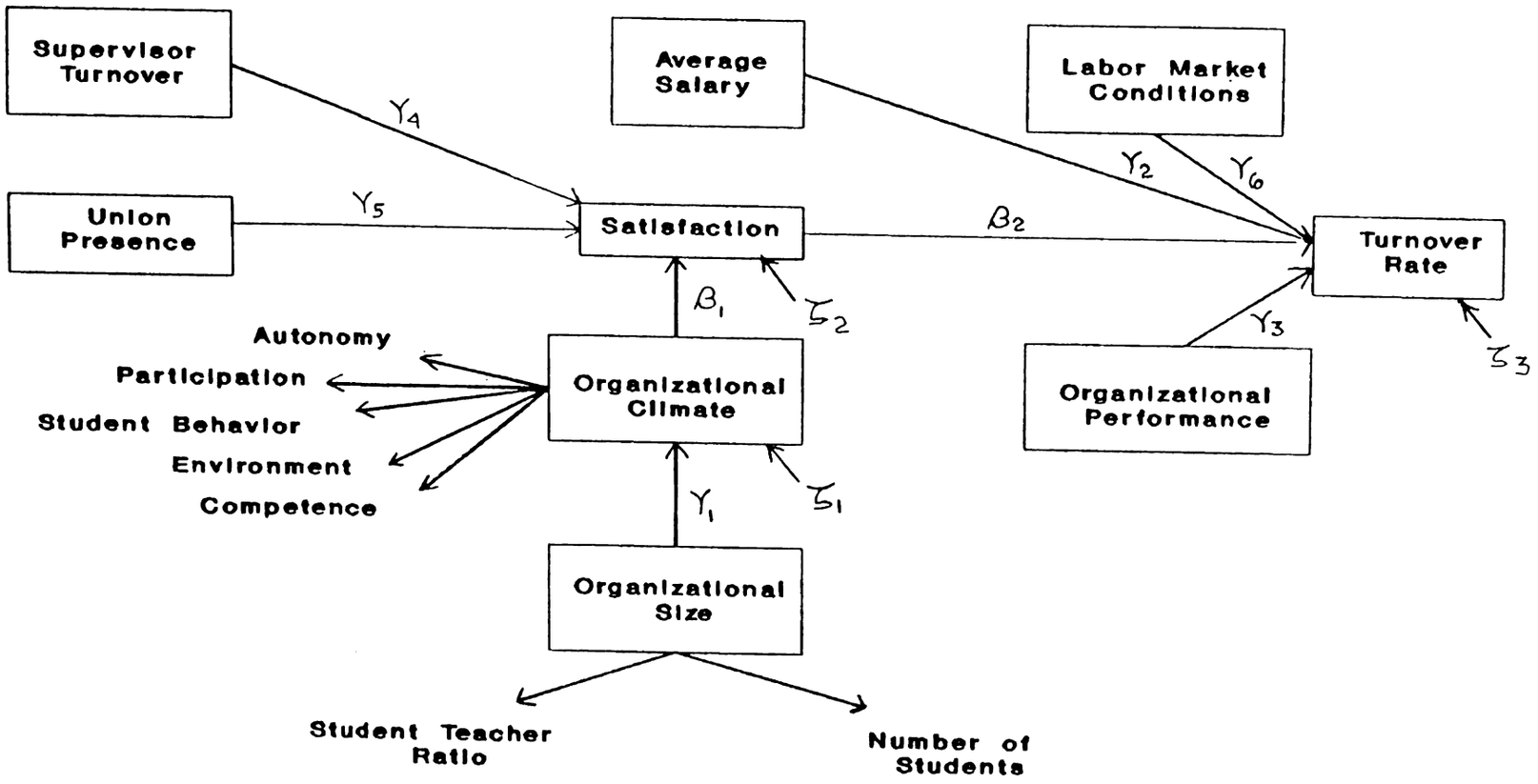
$$\begin{bmatrix} Y1 \\ Y2 \\ Y3 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \end{bmatrix}$$

(Exogenous Variables - 3rd Equation)

$$\begin{bmatrix} X1 \\ X2 \\ X3 \\ X4 \\ X5 \\ X6 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \\ \xi_4 \\ \xi_5 \\ \xi_6 \end{bmatrix} + \begin{bmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_4 \\ \delta_5 \\ \delta_6 \end{bmatrix}$$

Figure 3

Graphic Representation of the Proposed Path Model



the endogenous variables in the model (e.g., β 1 is a path coefficient between climate and satisfaction). The relationship between the exogenous and the endogenous variables is represented in the second part of the equation (e.g., γ 1 is a path coefficient between size and climate), and the last part is the error associated with this equation (e.g., ζ 1).

The second and third equations in Table 3 represent the measurement equation model, and link the latent constructs to the variables that are being used to measure the constructs. The second equation represents the relationship between the endogenous latent constructs (η_1 to η_3) and their observed indicators (Y_1 to Y_3), and the error (ε_1 to ε_3) associated with the relationship. The last equation in this Table is similar to the second, but represents the relationship between the exogenous constructs (ξ_1 to ξ_6) and their observed indicators (X_1 to X_6) plus error (δ_1 to δ_6). The LISREL program was used to evaluate the structural equation model (Hayduk, 1987; Schmitt & Bedeian, 1982; Williams & Hazer, 1986).

Several parts of the LISREL output were used to evaluate the proposed model. The fit indices and the chi-square statistic were examined to find out how well the model fits the data. Low values for these indices indicate that the data is well represented by the model.

The residual matrix was also be used to evaluate the fit of the model. The residual matrix should consist of low values indicating that the original correlation matrix, and the correlation matrix reproduced by the LISREL program were not very different.

RESULTS

Development of the Teacher Self-Report Measures

Climate. The climate items were combined to create the five climate dimensions which are worker competence, environment, student behavior, participation, and autonomy. The reliabilities of the dimensions are reported in the diagonal of Table 4. These reliabilities are high, with the exception of the environment dimension (.58).

As mentioned earlier, these dimensions would be combined into one summary climate measure if the dimension intercorrelations were high. An examination of the correlations in Table 4 indicates that the five dimensions cannot be combined into one measure. The correlations between some of the dimensions are very low. For instance, the correlation between the environment and participation dimensions is .06, and the correlation between the autonomy and student behavior dimensions is .16. However, the correlations do suggest that the dimensions can be combined into two climate measures. The first measure could be labeled environmental climate, and

Table 4

Climate Construct Intercorrelations[1]

	Wrkcmp[2]	Envron	Stdbeh	Partic	Autonm
Wrkcmp	(.87)[3]				
Envron	.41	(.58)			
Stdbeh	.59	.48	(.86)		
Partic	.42	.06	.35	(.78)	
Autonm	.22	.08	.16	.53	(.95)

[1] Sample size for all variables is 188

[2] Wrkcmp = worker competence; Envron = environment; Stdbeh = student behavior; Partic = participation; Autonm = autonomy.

[3] Reliability coefficients are presented in parentheses in the diagonal.

consists of dimensions that assessed the teachers' perceptions of their surroundings. The dimensions included in this measure were worker competence, environment, and student behavior (mean r = .49). The second measure of climate could be called degree of latitude climate which included the participation and autonomy dimensions (r = .53). These dimensions assessed the degree to which teachers could participate in policy decisions or make their own decisions without consulting their supervisors. The reliabilities of these two summary climate measures were computed, resulting in reliability coefficients of .85 for the first measure, and .90 for the second measure. The intercorrelation between the two climate measures was .30.

Satisfaction. The nine teacher satisfaction items were combined to form a summary measure of satisfaction. The reliability of this measure was .78.

Descriptive Statistics of the Model Components

Table 5 presents the means, standard deviations, and the ranges for the variables that are included in the organizational-level turnover model. The construct intercorrelations and reliabilities can be found in Table 6. Many of the correlations between the predictors and turnover are very low. The only significant correlations found in the table are between turnover and the number of

Table 5

Descriptive Information for Model Variables[1]

Variable[2]	Mean	SD	Range
Clim1	3.67	0.287	2.54 - 4.61
Clim2	1.30	0.227	0.84 - 1.99
Satis	3.26	0.293	2.48 - 4.17
Trate	0.03	0.045	0.00 - 0.24
Ratio	16.74	4.129	5.77 - 29.13
Studs	876.64	525.863	117 - 2541
Prins	1.10	1.025	0 - 6
Tcsal	27226.57	5719.312	15,250 - 42,000
Union	0.77	0.330	0.00 - 1.00
Dmand	3.17	0.300	2.40 - 3.56
Unemp	2.07	0.570	0.60 - 2.80
Perfm	66.38	14.406	6.0 - 96.8

[1] Sample size for all variables is 188

[2] Clim1 = Environmental climate measure, Clim2 = Degree of Latitude Climate measure, Satis = Satisfaction, Trate = Turnover Rate, Ratio = Student - Teacher Ratio, Studs = Number of Students, Prins = Principal Turnover, Tcsal = Average Teacher Salary, Union = Union Presence, Dmand = Teacher Demand Ratings, Unemp = Unemployment Ratings, Perfm = Organizational Performance

Table 6

Zero-Order Correlations[1] between Model Variables[2]

	Clim1	Clim2	Satis	Trate	Ratio	Studs
Clim1	(.85)[3]					
Clim2	.298	(.90)				
Satis	.654	.331	(.78)			
Trate	-.058	-.118	-.074	---		
Ratio	-.115	-.029	-.054	-.136	---	
Studs	-.127	-.130	.012	-.237	.557	---
Prins	-.118	-.026	-.154	.109	.073	-.006
Tcsal	.009	.021	.131	-.298	.137	.328
Union	-.115	.138	-.040	-.271	.033	-.008
Dmand	-.135	-.133	-.181	.052	.100	.234
Unemp	-.038	-.029	.067	-.167	.445	.199
Perfm	.509	.099	.287	-.020	-.110	-.045

$r = .127$, $p < .10$

$r = .154$, $p < .05$

[1] Sample size for all correlations is 188

[2] Clim1 = Environmental climate measure, Clim2 = Degree of Latitude Climate measure, Satis = Satisfaction, Trate = Turnover Rate, Ratio = Student - Teacher Ratio, Studs = Number of Students, Prins = Principal Turnover, Tcsal = Average Teacher Salary, Union = Union Presence, Dmand = Teacher Demand Ratings, Unemp = Unemployment Ratings, Perfm = Organizational Performance

[3] Reliability coefficients are presented in parentheses in the diagonal. The variables with dashes in the diagonal are one-item variables.

Table 6 (Cont'd)

Zero-Order Correlations[1] between Model Variables[2]

	Prins	Tcsal	Union	Dmand	Unemp	Perfm
Prins	---[3]					
Tcsal	-.028	---				
Union	-.146	.405	---			
Dmand	.167	-.190	-.276	---		
Unemp	.127	.300	.144	.071	---	
Perfm	-.112	.101	.019	-.061	-.110	---

r = .127, p < .10

r = .154, p < .05

[1] Sample size for all correlations is 188

[2] Clim1 = Environmental climate measure, Clim2 = Degree of Latitude Climate measure, Satis = Satisfaction, Trate = Turnover Rate, Ratio = Student - Teacher Ratio, Studs = Number of Students, Prins = Principal Turnover, Tcsal = Average Teacher Salary, Union = Union Presence, Dmand = Teacher Demand Ratings, Unemp = Unemployment Ratings, Perfm = Organizational Performance

[3] Reliability coefficients are presented in parentheses in the diagonal. The variables with dashes in the diagonal are one-item variables.

students, average teacher salary, unionization, and the unemployment measure. Similarly, there also high correlations between some of the predictors. For instance, most of the relationships between the climate, satisfaction, and performance measures are significant. Additionally, teacher salary is related to the number of students, unionization, and both of the labor market variables. The low zero-order correlations indicate that some of the paths proposed in the model will not be supported.

It also was necessary to compute partial correlations for the relationships between two of the variables with the other constructs. First, the percentage of students receiving free or reduced-price lunches was partialled out of the relationships between organizational performance (achievement) and the other constructs to control for social economic status. Additionally, the variance attributable to average state salary was partialled out of the relationships between average teacher salary and the other variables. These partial correlations are presented in Table 7. A comparison of the numbers in Tables 6 and 7 indicate that the partial correlations are not very different from the zero-order correlations. The one exception is between the unemployment measure and teacher salary. When the variance due to average state salary is

Table 7[1]

Partial Correlations between Model Variables

	Perfm[2]	Tcsal[3]
Clim1	.427	-.028
Clim2	.101	.018
Satis	.223	.113
Trate	.019	-.199
Ratio	-.180	.007
Studs	-.176	.325
Prins	-.086	-.077
Tcsal	.104	---
Union	.044	.287
Dmand	-.096	-.175
Unemp	-.236	-.159
Perfm	---	.104

r = . 15, p < .05

[1] Clim1 = Environmental climate measure, Clim2 = Degree of Latitude Climate measure, Satis = Satisfaction, Trate = Turnover Rate, Ratio = Student - Teacher Ratio, Studs = Number of Students, Prins = Principal Turnover, Tcsal = Average Teacher Salary, Union = Union Presence, Dmand = Teacher Demand Ratings, Unemp = Unemployment Ratings, Perfm = Organizational Performance

[2] These correlations represent the relationships between organizational performance (Achievement) and the other variables controlling for lunch (SES).

[3] These correlations represent the relationships between teacher salary and the other variables controlling for average state salary. Lunch and average state salary have both been partialled out of the relationship between organizational performance and teacher salary.

partialled out of this relationship, the correlation changes from .30 to -.159. Before describing the analysis of the model, two measurement issues will be discussed.

Measurement Issues

Common Method Variance. The relationship between climate and satisfaction was examined to determine if common method variance (CMV) was a possible explanation for the relationship. As mentioned earlier, the questionnaire was constructed so that the instructions and item responses were clearly written so that subjects could differentiate between the two constructs in an attempt to avoid this problem. After collecting the data, factor analyses were used to look for evidence of CMV.

There are no standard rules that can be used to examine a data set for CMV. Podsakoff and Organ (1986) suggest that the unrotated factor solution should be examined to determine if CMV exists. According to these authors, if only one factor is present in the unrotated solution or if a general factor is responsible for a majority of the variance in the results, this suggests that CMV is present. However, the rotated solution should also be examined for CMV. For instance, if the factor analysis resulted in climate items loading on one scale, and the satisfaction items loading on another scale, this would indicate that subjects were able to differentiate

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between the climate and satisfaction constructs. A series of factor analyses were conducted, and will be described in the following sections.

In the first analysis, the items that made up the climate and satisfaction constructs were factor analyzed. This analysis resulted in six factors with an eigenvalue over one. Table 8 presents the results of the unrotated factor matrix. The variance percentages at the bottom of Table 8 suggest that one general factor does account for a large amount of variance, but the other factors also account for variance. Examination of the rotated factor analysis indicates that most of the items in the matrix loaded on factors that could be interpreted as a satisfaction construct, or one or more of the climate dimensions (see Table 9). The items that loaded on factor 1 are the autonomy dimension items. Factor 2 represents the environment and student behavior climate dimensions. The items from the worker competence dimension load on factor 3, and satisfaction items load on factor 4. The fifth factor can be interpreted as the participation dimension, and although two of the satisfaction items load on the final factor, this sixth factor does not represent any of the dimensions.

There is another way to examine the data for CMV. In this second analysis, the computed climate and

Unrotated

	FAC
SAT1	.5
SAT2	.1
SAT3	.4
SAT4	.6
SAT5	.5
SAT6	.5
SAT7	.6
SAT8	.4
SAT9	.5
PART1	.4
PART2	.3
PART3	.6
PART4	.6
AUTO1	.5
AUTO2	.6
AUTO3	.6
AUTO4	.
AUTO5	.
ENV1	.
ENV2	.
SBEH1	.
SBEH2	.
SBEH3	.
WCMP1	.
WCMP2	.
WCMP3	.
WCMP4	.
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Table 8

tated Factor Matrix of Climate and Satisfaction Items[1]

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6
	.52	-.15	.50	-.06	.39	-.16
	.15	.26	.11	.69	-.09	.44
	.41	.03	.17	.58	.16	.26
	.60	.26	.23	-.35	.39	.10
	.53	.10	.31	.16	.33	-.26
	.54	.16	.05	.10	.22	-.51
	.62	.39	-.04	.18	.06	-.06
	.46	.36	.46	.13	-.29	.17
	.56	.10	.34	.29	.20	-.07
1	.42	-.19	-.56	.10	.34	.13
2	.30	-.28	-.41	.25	.36	.25
3	.63	-.38	-.26	-.07	.10	.14
4	.66	-.27	-.30	.02	.01	.16
1	.57	-.64	.11	-.08	-.09	.02
2	.60	-.65	.12	-.08	-.13	-.01
3	.61	-.66	.17	.00	-.15	.04
4	.58	-.68	.13	-.03	-.22	-.01
5	.53	-.69	.14	-.05	-.19	-.05
	.53	.35	.13	-.14	-.26	.30
	.44	.46	.46	-.11	-.20	.07
1	.67	.36	-.24	-.22	.06	.05
2	.58	.41	-.06	-.46	.03	.32
3	.60	.31	-.13	-.42	.05	.19
1	.64	.29	-.33	.26	-.30	-.27
2	.66	.35	-.34	.13	-.22	-.24
3	.59	.16	-.34	.12	-.29	-.22
4	.64	.31	-.14	-.07	-.03	-.19
r^2	30.9	15.1	8.1	6.7	5.0	4.6

AT1 to SAT9 are satisfaction items; PART1 to PART4 are
articipation items; AUTO1 to AUTO5 are autonomy
tems; ENV1 and ENV2 are environment items; SBEH1 to
BEH3 are student behavior items; WCMP1 to WCMP4 are
orker competence items.

Var = Percent of variance accounted for by each
factor.

Rotated Fa

	FACT 1
SAT1	.36
SAT2	-.12
SAT3	.13
SAT4	.07
SAT5	.1
SAT6	.0
SAT7	-.0
SAT8	.1
SAT9	.1
PART1	.1
PART2	.1
PART3	.5
PART4	.5
AUTO1	.8
AUTO2	.8
AUTO3	.9
AUTO4	.9
AUTO5	.8
ENV1	.
ENV2	.
SBEH1	.
SBEH2	.
SBEH3	.
WCMP1	.
WCMP2	.
WCMP3	.
WCMP4	.

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Table 9

otated Factor Matrix of Climate and Satisfaction Items[1]

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6
T1	.36	.19	-.10	.74 *	-.03	.03
T2	-.12	-.01	.10	-.03 *	.05	.87
T3	.13	.01	.09	.30 *	.20	.69
T4	.07	.69	.00	.53 *	.08	-.03
T5	.13	.11	.18	.71 *	.01	.14
T6	.07	.05	.48	.63 *	.04	-.08
T7	-.02	.34	.50	.35 *	.09	.27
T8	.12	.39	.21	.20 *	-.43	.50
T9	.18	.14	.18	.59 *	-.01	.38
RT1	.17	.12	.23	.04	.76 *	.01
RT2	.19	.00	.04	.04	.72 *	.18
RT3	.56	.26	.20	.08	.47 *	.00
RT4	.51	.27	.30	.03	.45 *	.10
TO1	.84 *	.07	.04	.13	.13	-.01
TO2	.88 *	.06	.07	.14	.10	-.01
TO3	.90 *	.04	.05	.14	.08	.09
TO4	.92 *	.01	.09	.09	.05	.02
TO5	.89 *	-.03	.06	.10	.04	-.03
V1	.13	.63 *	.25	-.01	-.19	.29
V2	.03	.53 *	.18	.27	-.47	.27
EH1	.04	.64 *	.46	.17	.21	-.01
EH2	.02	.88 *	.19	.05	.07	.00
EH3	.08	.77 *	.26	.10	.13	-.08
MP1	.10	.14	.88 *	.08	.06	.18
MP2	.06	.27	.83 *	.11	.09	.10
MP3	.18	.16	.75 *	.01	.09	.06
MP4	.07	.40	.58 *	.27	.05	-.01

SAT1 to SAT9 are satisfaction items; PART1 to PART4 are participation items; AUTO1 to AUTO5 are autonomy items; ENV1 and ENV2 are environment items; SBEH1 to SBEH3 are student behavior items; WCMP1 to WCMP4 are worker competence items.

These items were part of the scale that loaded on each of the factors.

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atisfaction scale scores were factor analyzed. The esults of the rotated factor matrix (see Table 10) ndicate that satisfaction, and three of the climate imensions (worker competence, environment, and student ehavior) load on one factor, while the other two climate imensions (participation and autonomy) load on a second actor. Finally, one last analysis examined the factor tructure of the two summary climate measures and atisfaction, and resulted in only one global factor.

Another method can also be used to determine if ethod variance may account for the relationships between limate and satisfaction. The correlations between these onstructs and other variables can be examined to find out f the pattern of correlations are similar. More pecifically, if the correlations between one climate easure and other variables are similar to the orrelations between satisfaction and the other variables, his is further evidence that a method variance problem as present. As an example, consider the correlations etween the organizational performance, climate, and atisfaction measures in Table 6. The correlation between rganizational performance and the first climate measure similar to the relationship between satisfaction and rganizational performance (i.e., .509 vs. .287). owever, the correlation between the second climate

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Table 10

Rotated Factor Matrix of Climate and Satisfaction Scales

	FACTOR 1	FACTOR 2
Satisfaction	.80	.21
Autonomy	.07	.84
Participation	.21	.86
Worker Competence	.72	.34
Student Behavior	.76	.21
Environment	.84	-.14

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measure and organizational performance was not similar to the other two correlations (i.e., .099 vs. .509 and .287). This pattern of correlation similarity (or lack of similarity) exists throughout Table 6.

To summarize, method bias probably accounted for some of the variance between the first climate measure and satisfaction. In contrast, the relationships between the two climate measures, and the second climate measure and satisfaction were most likely not affected by method bias.

Levels of Analysis Issues. Two statistical methods were used to examine whether the two climate constructs and the satisfaction construct could be considered organizational-level constructs. Eta squares were computed by conducting analyses of variance at the individual-level of analyses for each of these constructs by school. To derive the eta squares, the between-group sums of squares were divided by the total sums of squares to determine the amount of variance attributable to the school. These analyses resulted in eta squares of .27 for the environmental climate construct, .15 for the degree of latitude climate construct, and .19 for satisfaction. As mentioned earlier, James (1982) reports that the median eta square reported in research is .12, so the magnitude of these eta squares was high. The data are consistent

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ith the notion that the three constructs are meaningful
t the organizational level.

A second way to determine if these constructs could
e considered organizational-level variables is to examine
he correlations between the constructs at both levels of
nalysis. As can be seen, in Table 11, the patterns of
orrelations at the individual-level of analysis are
imilar to those found at the organizational level. At
he individual level of analysis, the correlations were
omputed using only those teachers in the 188 schools in
he sample. According to Rousseau (1984), the
orrelations at one level must be similar in direction and
agnitude for the constructs to be considered isomorphic.
he results of these analyses suggest that the climate and
atisfaction constructs can be considered isomorphic to
he individual-level variables.

Analysis of Potential Moderators. Earlier, it was
ypothesized that the labor market variables might
oderate the relationship between satisfaction and
urnover. Moderated multiple regression was used to
xamine these relationships. The results of the analyses
re presented in Tables 12 and 13, and indicate that the
nemployment measures do not moderate the satisfaction -
urnover relationship. In fact, these analyses show that

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Table 11

Comparison of Individual-Level and Organizational-Level Zero-Order Correlations[1]

Variables[2]	Ind. Level	Org. Level
Climate1 & Climate2	.232 (n=7513)	.298 (n=188)
Climate1 & Satisfaction	.527 (n=7527)	.654 (n=188)
Climate2 & Satisfaction	.398 (n=7653)	.331 (n=188)

[1] The data used for the individual-level correlations were the teachers in the 188 schools in the sample.

[2] Climate1 = Environmental Climate; Climate2 = Degree of Latitude Climate

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Table 12

Regression Analysis with Teacher Demand Ratings as the Moderator Variable

Variables in regression equation	Multiple R	B-weight	R^2 Change	F of Change
Step 1:				
Demand Ratings		-.14[1]		
Satisfaction	.08	-.15	.007	.65
Step 2:				
Demand X Satis	.12	.04	.006	1.19

[1] B-weights are those reported after all variables have been entered into the equation.

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Variables in regres equation	
Step 1:	
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Step 2:	
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Table 13

Regression Analysis with Professional Unemployment as the Moderator Variable

Variables in regression equation	Multiple R	B-weight	R^2 Change	F of Change
Step 1:				
Professional Unemployment		.05[1]		
Satisfaction	.18	.03	.03	.05
Step 2:				
Pemp X Satis	.19	-.02	.005	.32

[1] B-weights are those reported after all variables have been entered into the equation.

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none of the predictors included in these analyses account for a significant amount of variance in turnover rates.

LISREL Analysis of the Model

The computer program LISREL was used to test the hypothesized structural model and the hypotheses. This program is used to evaluate the relationships that are hypothesized to exist between the latent variables in the specified model.

Several different types of data can be used as input to the LISREL analysis, such as a covariance matrix, a correlation matrix, or raw data. A covariance matrix is typically used as input (Bentler, 1980). Cudeck (1989) asserts that the results of a LISREL analysis when a correlation matrix is used may be different than when a covariance matrix is used as input. The use of a correlation matrix instead of a covariance matrix may affect the standard errors and the tests of significance. However, the use of a covariance matrix in this model resulted in an error, which stopped the computer from completing the analysis. The program was unable to converge to reach a solution because of various indeterminancies in the data matrix. The data or parts of it are such that various matrix operations cannot be performed.

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The statistical package used to examine this model as SPSSX LISREL VI (Joreskog & Sorbom, 1986) fourth dition. The program that was written to analyze the odel can be found on the first three pages of Appendix H. correlation matrix was used as input to the analysis. s mentioned, some partial correlations which controlled or state salary and socioeconomic status were included in his matrix instead of the zero-order correlations.

odel Specification

There were seven exogenous variables in the model, ncluding organizational performance, principal turnover, nion presence, teacher salary, two labor market ariables, and organizational size. The two indicators of ize, number of students and student - teacher ratio, were oderately correlated (r = .56), and were considered to be ndicators of the same underlying construct. Although eacher demand ratings and professional unemployment were oth intended to be measures of the labor market, the two easures were uncorrelated (r = .07). Thus, the measures re considered as separate labor market constructs.

Also included in the model were four latent ndogenous variables which included the two measures of limate, along with measures of satisfaction, and turnover ate. The correlation between the two climate measures

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vas low (r = .30), so these measures were considered as separate measures of climate.

Description of the Paths in the Model.

Each of the matrices used in the LISREL program will be briefly described. Specifically, these matrices describe the model presented earlier in Figure 3. Pattern matrices and matrices of start values must be specified in a LISREL analysis. The pattern matrices described the causal paths in the model, while the matrices of start values provide the computer with values with which the analyses are started. Appendix G provides the construct labels that correspond to the etas and ksis found in these matrices. The program used to evaluate Figure 3 is provided in Appendix H, but only the pattern matrices will be described here. These matrices can be found on pages 169 and 170 of Appendix H. The pattern matrices consist of zeroes and numbers. The zeroes are used to indicate that relationships between certain variables were not estimated by the program. These values were usually fixed at 1.00 or .00. The non-zero numbers in the matrix are used to indicate that a factor loading or a path between two variables was to be estimated. The pattern matrices reflect the hypotheses implicit in Figure 3.

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Some modifications to the original model were made in rder to achieve an estimable model. These modifications nvolved aspects of the measurement model. None of the odifications involved any of the structural coefficients ypothesized earlier. Modifications will be described in ne following sections.

Lambda Y (LY). This matrix specifies which variables ere considered to be measures of the same underlying onstructs. Each of the measures were considered to be ingle indicators of the underlying constructs.

Lambda X (LX). This matrix also specifies the ariables that were considered to be measures of the same nderlying constructs. The value of one in this matrix is factor loading of number of students on the size onstruct. The factor loadings of the other size ndicator, student-teacher ratio, were fixed at 1.00 as a caling factor. The other six exogenous variables are eparate indicators of the six latent constructs.

Beta (BE). This matrix specifies paths between the ndogenous variables. In this case, the program estimated aths from the climate measures to satisfaction, and from atisfaction to turnover rate.

Gamma (GA). The paths from the exogenous constructs o the endogenous variables are specified in this matrix. even paths are specified. These paths include one from

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ize to climate, two from union presence and principal urnover to satisfaction, and four from organizational erformance, salary, and the two labor market measures to urnover rate.

Phi (PH). The PH matrix specifies the relationships etween the residuals of the exogenous variables. In this odel, the residuals associated with organizational size nd salary were assumed to be correlated as were those ssociated with organizational size and professional nemployment, union presence and salary, and union resence and teacher demand ratings. Modification indices n preliminary analyses suggested that the residuals of hese constructs were related. While some other residuals ere interrelated, these interrelationships were not ubstantively meaningful.

Psi (PS). This matrix specifies the correlations etween the residuals of the endogenous variables. The esiduals of the two climate measures were assumed to be orrelated. Additionally, the climate and satisfaction esiduals should be correlated, because these constructs ere both measured with self-report instruments. However, he relationship between the second climate measure and atisfaction was not estimated in order to achieve an stimable model.

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Theta Epsilon (TE). The errors associated with the erved endogenous variables are found in this matrix. e errors associated with the endogenous variables were t estimated, and were fixed at zero in order to achieve estimable model.

Theta Delta (TD). This last matrix includes the rors associated with the observed exogenous variables. e only variables for which error was not estimated were udent-teacher ratio and union presence. Again, these o errors were fixed at zero to achieve an estimable del, and because errors of measurement in these two riables were thought to be minimal or zero.

Results of the LISREL Analysis

The results of this analysis can be found in Appendix starting on page 173. Several sections of these results re used to evaluate the hypothesized model.

t Indices

Chi Square. When evaluating a model with LISREL, a nsignificant chi square indicates that the model is a od fit, whereas a significant chi square suggests that e model does not fit the data well. This analysis sulted in a chi square of 199.87 with 50 degrees of eedom (see page 175 in Appendix H). The chi square was gnificant ($p < .000$), which by itself, indicates that e model does not fit the data. However,

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archers recognize that the chi square statistic is
ndent on sample size, and will often be significant
the sample size is large (Bentler, 1980). Bentler
0) suggests that other methods should be used to
uate a model, such as an index that is not affected by
ple size, (e.g., the residual matrix).

Goodness of Fit and Adjusted Goodness of Fit Indices. goodness of fit index (GFI) is a measure of the degree which the model accounts for the observed variance-ariance matrix. This measure is independent of sample e. The adjusted goodness of fit index (AGFI) adjusts GFI for degrees of freedom (Joreskog & Sorbom, 1986). se measures can range from zero to one, with a value r one indicating a good fit of the model. While any e-of-thumb is arbitrary, a value above .90 is usually sidered evidence of relatively good fit. The results this analysis showed that the GFI was .865 and the AGFI .789 (see page 175 of Appendix H), indicating that the el did not fit the data as well as might be desired.

Root Mean Square Residual (RMSR). This fit index is easure of the mean residual variances and covariances reskog & Sorbom, 1986). A value near zero (i.e., less n .05) would suggest a good fit of the model. The RMSR ociated with this model was .112, again indicating that model did not fit the data well.

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These fit indices provide information on the overall
of the model, but do not indicate why the model does
fit, or which parts of the model do not fit (Joreskog
Sorbom, 1986). These questions were answered by
amining other sections of the results, such as the
uared multiple correlation values, the residual matrix,
d the paths in the model.

uared Multiple Correlation Values

Table 14 presents the structural equations and
uared multiple correlation values associated with the
ree endogenous variables. The R^2 values indicate that
e proportion of variance shared by the endogenous
riables and their predictors is low. These low values
ggest that variance in none of the endogenous variables
s very well explained.

sidual Matrix

The fitted residual matrix presents the difference
tween the original correlation matrix, and one
produced by the LISREL analysis (see page 182). The
lues in this matrix would be near zero had the model
en a good fit. The normalized residuals, found on page
3 of Appendix H, corrects these residuals for sample
ze and scaling differences (Bollen, 1989). If the model
d a good fit, almost all of the values in this matrix
uld be below 2.0; any value above 2.0 is an indication

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Table 14[1]

ructural Equations and Multiple Squared Correlations of the Endogenous Variables

	Structural Equations	Multiple R^2
ironmental mate	-.11 (Size)	.012
ree of itude Climate	-.03 (Size)	.001
isfaction	.342 (Clim1) + .226 (Clim2) - .077 (Prins) - .010 (Union)	.382
rnover	-.236[2] (Tcsal) + .021 (Dmand) -.208[2] (Unemp) + .001 (Perfm) -.027 (Satis)	.099

Clim1 = Environmental climate measure, Clim2 = Degree of Latitude Climate measure, Satis = Satisfaction, Trate = Turnover Rate, Ratio = Student - Teacher Ratio, Studs = Number of Students, Prins = Principal Turnover, Tcsal = Average Teacher Salary, Union = Union Presence, Dmand = Teacher Demand Ratings, Unemp = Unemployment Ratings, Perfm = Organizational Performance

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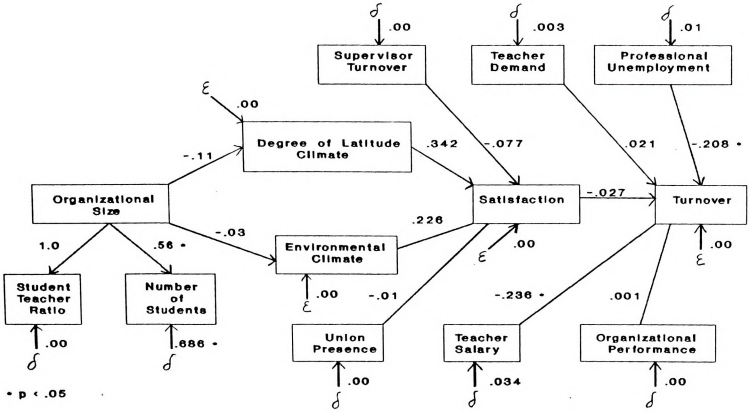
a problem with the model. The matrix on page 183 shows
at fourteen of the values were above 2.0, which is
rther evidence that the model is not completely
propriate. These values can also be used to suggest
ditional paths in the model, but this will be discussed
ter in a section on possible alterations to the model.

The path diagram resulting from the analysis was
amined to understand what aspects of the model
re confirmed, as well as the hypotheses that were not
pported. The path coefficients can also be found on
ges 173 and 174 of Appendix H. T-values (pages 180 and
1 of Appendix H) were used to determine which paths in
ne model were significant. Figure 4 presents the
ypothesized model including the path coefficients
btained from the LISREL output in Appendix H. The path
iagram in Figure 4 shows that the only paths that were
ignificant were from teacher salary to turnover and from
rofessional unemployment to turnover. The other paths
hat were hypothesized to have a direct or indirect
nfluence on turnover rates were nonsignificant. The
ndicator of organizational size that was estimated was
ignificant. However, the magnitude of the error
ssociated with this measure was high, and significant.
he errors that were associated with the other constructs
n the model were low and nonsignificant. The number of

Figure 4

Figure 4
Results of the Analysis of the Proposed Model



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onsignificant hypothesized structural coefficients in the igure along with the other results that have been iscussed indicate that the model did not fit the data ell.

Summary of the Results of the Hypotheses

The first hypothesis suggested that five constructs ould have a direct, negative effect on turnover. These onstructs were the teacher demand ratings, professional nemployment, organizational performance, salary, and atisfaction. The only two of these variables that were ound to be significant predictors were salary and rofessional unemployment.

The second hypothesis suggested that satisfaction ould mediate the relationships between the climate easures and turnover. The structural coefficients rovide no support for this hypothesis.

Satisfaction was also hypothesized to mediate the elationships between union presence and turnover, and upervisor turnover and turnover in hypotheses three and our. These hypotheses were not confirmed by the LISREL nalysis.

The fifth hypothesis suggested that climate and atisfaction would mediate the relationship between size nd turnover. Again, these relationships were not ignificant.

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Finally, the two labor market variables were hypothesized to moderate the satisfaction - turnover relationship. The results of moderated multiple regression reported earlier indicated that these two variables did not moderate this relationship.

Alterations to the Model

After examining the fit of the hypothesized model, modification indices, residuals and t-values were used to modify the model to attempt to increase the fit of the model. These additional analyses were considered exploratory, not confirmatory analyses. The t-values indicate which of the paths in the model were significant. However, the t-values can also be used to determine which paths can be deleted. The two structural coefficients in Figure 4 that were significant were from salary to turnover, and from professional unemployment to turnover, suggesting that all other paths could be deleted from the model.

The modification indices, found on pages 176 and 177 in Appendix H, provide information about other paths that could be included in the model. If a path suggested by the modification indices is added to the model, the chi square statistic will be reduced by an amount equal to the value of the modification index. Thus, high values indicate places in the model where paths could be added if

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the paths are conceptually meaningful. Many of the modification indices were moderate to high values, but most of the paths suggested by these indices were not substantively meaningful. However, the modification indices did suggest two additional paths that were logical. The first modification was a direct path from union presence to turnover rate, deleting satisfaction as a mediator. This relationship was suggested in the literature at the individual level. The second change suggested by the modification indices was that organizational performance might be a direct antecedent of the first measure of climate, not turnover. This path was also logical because the achievement test data that was collected was administered during the 1986-87 school year while the climate measure was obtained during the fall of 1987. Thus, the teachers should have known the results of the achievement tests by the fall of 1987, and this knowledge could have influenced their perceptions of climate.

The normalized residuals can also be used to identify other paths that could improve the fit of the model. Both of the paths suggested by the modification indices that were discussed above also had normalized residual values above 2.0. In fact, the relationship between environmental climate and organizational performance had

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the highest value in the matrix. Other paths suggested by these indices did not seem meaningful.

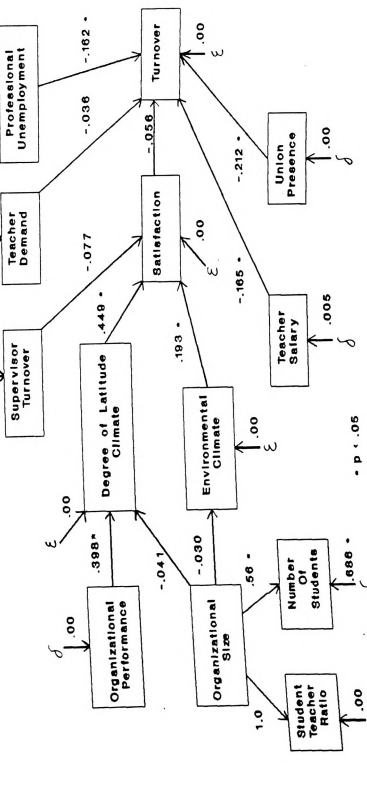
Description of the Revised Model

Two additional paths that were suggested by the modification indices are included in this revised model. The new paths are from organizational performance to environmental climate and from union presence to turnover. The two paths that were deleted were from organizational performance to turnover, and from union presence to satisfaction. The significance of the error term size indicator suggest that the two size indicators should be separate constructs. Conceptually though, the two size measures should be related; thus this change was not included in the revised model.

The fit indices of the model indicated that the revised model had a better fit with the data. The chi square decreased from 199.87 to 156.51. The GFI and the AGFI increased slightly from .865 to .890 and from .789 to .829 respectively. The RMSR decreased from .112 to .096. Overall, these indices suggest that the new paths slightly improve the fit of the model.

The revised model is presented in Figure 5. This model resulted in more structural coefficients that were significant. As Figure 5 indicates, the same two paths that were significant in the previous analysis were also

Figure 5
Results of the Analysis of the Revised Model



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significant in this revised analysis. Additionally, the paths from union presence to turnover, from organizational performance to environmental climate, and from both climate measures to satisfaction have significant structural coefficients in this revised model. However, there were a number of paths that were not significant suggesting that the revised model was still not completely representative of the turnover process.

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DISCUSSION

Summary of Results

The results of the LISREL analysis indicated that the hypothesized model did not adequately fit the data. The fit indices, squared multiple correlation values, and the residual matrices all provided evidence that the model was not appropriate. However, two of the hypothesized paths were supported by the results of the initial analysis. Teacher salary and the professional unemployment measure were both found to be significant predictors of turnover. The relationship between turnover and these two predictors was negative.

The constructs that were aggregated to the organizational level, including climate, satisfaction, and organizational performance, were not related to turnover. Other hypothesized relationships that were nonsignificant in this sample included relationships between size and the two measures of climate, principal turnover and satisfaction, union presence and satisfaction, and teacher demand and turnover.

The results of the analysis of a revised model indicated that this model fit the data somewhat better

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than the hypothesized model. As indicated in Figure 5, three additional paths in the model were significant. Organizational performance was related to environmental climate, both climate measures to satisfaction, and union presence to turnover. Even though inclusion of the paths from organizational performance to environmental climate, and the climate measures to satisfaction improved the fit of the model, these paths did not improve the predictability of turnover because of the low correlation between satisfaction and turnover.

Implications of Study

This study is important for two reasons. It has broadened our knowledge of the turnover process, and has also provided information on levels of analysis issues. Issues related to the turnover process will be addressed first.

The Turnover Process. The hypothesized model was based, in part, on the findings of research that has been conducted at the individual-level of analysis. The fact that the hypothesized model did not fit the data suggests that the predictors of organizational turnover are different from those of individual-level turnover. Thus, those variables that account for variance in an individual's decision to leave an organization are not the same variables that predict the percentage of employees

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that will leave an organization during a specified period of time.

Rousseau (1985) suggested that economic variables account for much of the variance at the unit level, while affective variables and behavioral intentions account for variance at the individual level of analysis. In fact, this study showed that satisfaction, which is almost always found to be important in the turnover process at the individual level, was unrelated to turnover at the organizational level. Moreover, two of the three variables that were related to turnover were economic variables (i.e., professional unemployment and teacher salary). It also could be argued that the third significant correlate of turnover, union presence, would have an effect on economic conditions in schools. This study provided support for Rousseau's contention that economic variables are important at the organizational level. Furthermore, it does not appear that hypotheses based on the results of research done at the individual level provide an understanding of turnover at the organizational level.

Although this study was not entirely successful in modeling the turnover process, this type of study is important. According to Terborg and Lee (1984), studies of this type are needed in order to develop a model of

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turnover that is comprehensive and multi-level, so that researchers have a better understanding of the turnover process.

Implications of specific paths in the Model. Each of the hypotheses will be addressed in this section. Results regarding several of the specific relationships that were explored have implications for turnover research, and these implications will be discussed. Additionally, each of the paths that were nonsignificant will be discussed. This section addresses each of the relationships that were hypothesized earlier as well as the relationships that were discovered during the analysis of the model. The relationships that were found to be significant will be addressed first.

Teacher Salary - Turnover. Hypothesis 1 suggested that salary would have a direct negative effect on turnover. This study confirmed this relationship between salary and turnover, and these results indicate that the relationship at the organizational level is different from the relationship reported at the individual level of analysis. At the individual level, the relationship between salary and turnover is mediated by satisfaction, but at the organizational level, salary was found to be a direct predictor of turnover. The significant relationship found between teacher salary and turnover in

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this study is similar to the findings of earlier research at the organizational and departmental levels. Katzell et al. (1961) and Wales (1970) found that salary was significantly correlated with turnover. In this study, the relationship between these two constructs was negative, indicating that higher salaries are associated with lower turnover rates.

Professional Unemployment - Turnover. Hypothesis 1 also suggested that labor market conditions would have a direct negative effect on turnover. Measures of labor market conditions have been reported to be significantly related to turnover in previous organizational-level research (e.g., Eagly, 1965; Terborg & Lee, 1984). Although teacher demand ratings were not found to be predictive of turnover, a significant negative relationship was found between professional unemployment and turnover, indicating that when more jobs were available, turnover was higher. The professional unemployment measure was a general measure of labor market conditions. Thus, the relationship between this measure and turnover may have been affected by teachers who had left their teaching careers for other professions.

Individual-level research also indicated that labor market conditions might moderate the relationship between satisfaction and turnover (Muchinsky & Morrow, 1980;

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Carsten & Spector, 1987). The sixth hypothesis indicated that this relationship might also be found at the organizational level. However, the results of the present study did not support this hypothesis.

Union Presence - Turnover. Satisfaction was hypothesized to mediate the relationship between union presence and turnover (Hypothesis 3). However, the research that has been conducted thus far has produced mixed results, so it was stated earlier that the role of union presence in the turnover process would be explored. The results of the LISREL analysis showed that satisfaction did not mediate this relationship, but that union presence had a direct relationship with turnover. The relationship between these two constructs was negative indicating that when a lower percentage of teachers belong to a teachers' union, turnover is higher. This finding suggests that the presence of a union would most likely be related to lower turnover in organizations that are similar to schools, but this result should be explored using other samples. Often, upper management are opposed to having a union started in their companies, or dealing with existing unions. This relationship between unionization and turnover suggests that the acceptance of unions in organizations might be one way to decrease organizational turnover.

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Organizational Performance - Climate. Organizational performance was originally hypothesized to be a direct predictor of turnover (Hypothesis 1). However, this relationship was not significant. The statistics in the LISREL output suggested that organizational performance did predict climate, and a revision of the model did support this supposition. Although the significant path from organizational performance to climate did not add much to the prediction of turnover, the relationship itself was interesting. Previous research at the unit or organizational level of analysis has yielded inconsistent results. As mentioned earlier, researchers have reported finding a significant relationship (both positive and negative) as well as a nonsignificant relationship between these two variables (Heller et al, 1984; Pritchard & Karasick, 1973; Schneider & Snyder, 1975). It is difficult to explain with any amount of certainty why the results of these studies have been so different. The three studies mentioned above and the present study have all used different climate surveys, different performance measures, and different samples. Any or all of these differences (or one not cited) could have been the cause for the various findings. The zero-order correlation between the environmental climate measure and performance was substantial ($r = .509$, $p < .05$), and the t-value

associated with the path in the LISREL analysis was high ($t = 5.27$, $p < .01$). Thus, the relationship in the present study was a strong one.

Supervisor Turnover - Satisfaction. The relationship between supervisor turnover and organizational turnover was hypothesized to be moderated by satisfaction (Hypothesis 4). At the individual level, Williams and Hazer (1986) showed that leader-subordinate relationships were predictive of satisfaction in the turnover process. The hypothesized relation between supervisor turnover and satisfaction was based on the assumption that supervisor turnover could be used as a substitute for leader-subordinate relations at the organizational level. However, this assumption may have been incorrect. This study indicated that the relationship was not significant. Although supervisor turnover and leader-subordinate relations would almost always be related, supervisor turnover may not affect satisfaction at the organizational level in the same way that leader-subordinate relations does at the individual level.

Another explanation may also account for not finding a relationship between supervisor turnover and satisfaction. The basis for this explanation is the sample used in the current study. Research has shown that supervisor turnover leads to an increase in the number of

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new rules and regulations that are put into effect (Carlson, 1962; Grusky, 1959). This increase in rules and changing procedures was hypothesized to lead to decreased satisfaction. It is possible that when a new principal starts at a school, any new rules implemented by the principal would not have much of an effect on the teachers' routine. Thus, the overall satisfaction of teachers in schools would not be affected. Additionally, teachers may not interact with principals to the same degree as employees in other occupations, so the degree of supervisor turnover would not have as much of an effect on overall satisfaction. It would be interesting to use this measure in other samples to see if the relationship between supervisor turnover and satisfaction was significant in samples where there is more interaction between supervisors and their subordinates.

Size in the Turnover Process. This study did not provide any new information about the role of size in the turnover process. Again, previous research between these variables has yielded inconsistent results. The hypothesis in the present study that the size of the school would influence the teachers' perception of climate was not supported (Hypothesis 5). The zero-order correlation between one of the two size constructs (number of students) and turnover was significant, but the

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correlation between the other size variable, student-teacher ratio, and turnover only approached significance ($r = -.136$, $p < .10$). This suggests that a direct relationship between size and turnover might be appropriate at the organizational level. However, the modification indices in the original LISREL analysis did not support the inclusion of a path between the size construct and turnover.

Climate and Satisfaction in the Turnover Process. Satisfaction was predicted to have a direct negative effect on turnover (Hypothesis 1), and was predicted to mediate the relationship between climate and turnover (Hypothesis 2). These hypothesized relationships were not supported by the results of this study. Potential reasons for the all of the above mentioned nonsignificant findings are discussed later in the sections on levels of analysis issues and study limitations.

Practical Implications. Identifying the determinants of organizational turnover is also important for practical reasons. It would be useful if organizations could estimate the percentage of people that will leave during a period of time. This estimate would enable organizations to include the selection and training costs of new hires in their budgets. Some organizations also may want to decrease their turnover rates. An attempt to decrease

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turnover would most likely result in the retention of some employees who are poor performers. However, if the turnover rate is extremely high, it may be worthwhile for an organization to retain some poor performers so that they also retain good performers. The results of this study suggest that organizations could raise salaries or allow unions to grow in order to decrease turnover. Of course, both of these "solutions" may be undesirable for other organizational reasons. Further study of the determinants of organizational turnover would probably result in the identification of other variables that could be used by organizations that want to estimate or decrease turnover. Perhaps the major implication is that attacking the turnover problem at the individual level may not produce the desired organizational-level consequences.

Levels of Analysis. As mentioned earlier, the constructs that were aggregated were not related to turnover. Eta squares found for those variables which were aggregated suggest that there could have been a problem with the supposition that these constructs have meaning at the organizational level of analysis. As mentioned earlier, the median eta square reported in the literature is .12. The eta squares found in this research were .15 (degree of latitude climate), .19 (satisfaction), and .27 (environmental climate). Although the eta squares

found were higher than the median level usually found in research, these figures indicate that there was much more within-organizational variance in these constructs than between-organizational variance. Thus, the differences at the individual level are averaged when the responses are aggregated.

Furthermore, there is reason to believe that the aggregation of individual-level satisfaction responses would not necessarily be related to organizational turnover. We can conceptualize the relationship between employee satisfaction and turnover at the individual level as lining all of the employees in front of the door to the organization in order of their degree of satisfaction. The employees in the front of the line, closest to the door, would be those people who were the most dissatisfied. However, factors other than an employee's dissatisfaction also play a role in the turnover decision, so those closest to the door may not be the employees that actually leave the organization.

This line of reasoning is also true at the organizational-level of analysis. More specifically, aggregated satisfaction does not provide information on how many people would actually leave an organization. Furthermore, this relationship between aggregated

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satisfaction and turnover rate would be lower because of the variance that is lost when satisfaction is aggregated.

The results of this study suggest that satisfying the criteria that are used by researchers to ensure that constructs can be considered organizational-level constructs may not provide sufficient evidence that the constructs have meaning as organizational variables. That is, eta square statistics and similar correlations at the individual and organizational levels may not guarantee that the constructs have meaning at the organizational level.

The measure of organizational performance also may not have meaning at the organizational level of analysis. This measure was not a rating, so agreement could not be assessed. Additionally, the individual-level data were not available, so the correlations at one level could not be compared to the correlations at the second level. Thus, there is no evidence of the quality of this measure at the aggregate level.

Limitations of the Study

There were some potential problems with the sample and some of the measures used in this study that may have affected the results. Each of these problems will be discussed next.

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Sample. The factors that have an effect on the turnover rate of schools may be different from those that influence turnover in other types of organizations. For instance, a more stable measure of labor market conditions might have been found for another sample. Additionally, it may be more difficult for teachers to find other teaching jobs, so teachers that would otherwise leave their jobs end up staying with their school. Thus, the results of this study could have been different had another sample been used.

Turnover. It is impossible to know the amount of error that was included in the turnover measure that was provided by the principals. This measure would be affected by error if the principals did not include all those who left voluntarily when asked how many teachers had left. Conversely, if the principal included other individuals who did not leave the school voluntarily, error would have affected the measure.

Satisfaction. The eta squared statistic and the correlational results presented earlier supported the analysis of this construct at the organizational level. As mentioned earlier though, Rousseau (1985) suggests that constructs that will be aggregated to a higher level should be worded so that the questions refer to the group level to which the construct will be aggregated. In this

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study, the climate items were worded at the organizational level, but the satisfaction items were worded at the individual level. This may have affected the relationships between satisfaction and other organizational-level constructs.

Unemployment Measures. It was difficult to identify appropriate indicators of the labor market for teachers. The most appropriate measure seemed to be the teacher demand ratings supplied by James Akin (1989), because the professional unemployment measure was a general measure in that it included many other professional careers. However, there were problems with the demand ratings. As mentioned earlier, there was no indication of how reliable these ratings were. Additionally, the areas of the country identified by Akin were extremely broad. In fact, in one area of the country (the southeast), ten states were combined. It is probable that some of the states (e.g., Kentucky and Florida) that were combined in the various country areas did not have similar hiring needs for teachers. Even though the teacher demand ratings seemed more appropriate, the professional unemployment measure had a higher and a significant correlation with turnover. It is unclear whether the nonsignificant relationship between the demand ratings and turnover was caused by the construction and possible unreliability of

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the demand measure, or whether the two constructs were just unrelated.

Future Research Directions

Researchers have just recently recognized that the determinants of turnover at the organizational level are important to understand. The study of the turnover construct at this level of analysis is still in the early stages. Models such as the one proposed can be modified and examined using different samples of employees. Additionally, researchers should attempt to identify other constructs that exist at the organizational level of analysis that may be important in the turnover process. Several constructs that researchers may want to consider will be discussed next. Some of these constructs are similar to those in the proposed model while others are different. Following that discussion, some levels of analysis issues will be considered.

Leader Subordinate Relations. It would be useful to explore other measures that might represent leader-subordinate relations at the organizational level. For instance, a measure of leader effectiveness collected from subordinates might provide information about leader-subordinate relations. It also might be useful to ask upper management about the organizations' philosophy on

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how supervisors should act (e.g., participative, directive). Finally, a variable that reflects the recency of leader turnover might provide information about the relationship between supervisors and their subordinates.

Satisfaction. If there is a problem aggregating satisfaction to the organizational level, perhaps another measure that is similar to satisfaction exists naturally at the organizational level and could be identified. For instance, the percentage of employees that normally participate in nonmandatory work functions might provide information about how much the employees like the organization or the other employees in the organization. In a unionized organization, the number of grievances filed may also provide information about the satisfaction level of the employees.

Organizational Climate. Although organizational climate was not predictive of organizational turnover in this study, the construct should be considered in other research before dismissing its potential importance. Zohar (1980) contends that the type of climate measure used should be specific to a certain situation. Thus, certain climate measures may be important in some situations and unimportant in others. For instance, a climate for safety (Zohar, 1980) might be more important in a factory, and less important in a department store.

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Training. The existence of training opportunities may be important in predicting organizational turnover. Management's attitude toward training might be more important than the training itself. For instance, if employees realize that management considers training to be worthless or only good for providing skills that their employees should already have, training opportunities may have no impact on the turnover rate, or may even increase the amount of turnover. So, if management considers training to be a demeaning process, the employees may also perceive it that way. On the other hand, if training is perceived as an opportunity, as a productive process that employees can use to hone their skills or learn new ones, the existence of training should have a negative effect on the turnover rate of an organization. However, it should be noted that a positive training experience can also lead to turnover if employees gain skills that are marketable elsewhere.

Societal Variables. The only societal variables that were considered in the present study were the economic variables. Future research endeavors might include other constructs such as the cost of living, the crime rate, and the amount of entertainment in the area. These variables have not been considered in previous studies, but could be important in the turnover process. It is reasonable to

hypothesize that in some areas of the country, the cost of living is so high that employees of organizations in the area consider moving to another area that has a lower cost of living, and consequently leave the organizations.

Individual Performance. One variable that was discussed earlier as having potential importance in this area is individual performance. Researchers have concluded that not all turnover should be considered as having negative consequences for the organization. The question that should be addressed here is whether the computation of organizational turnover should be weighted in some way to account for the degree to which an organization will be hurt by the loss of each individual that does leave. Several researchers would argue that the performance level of former employees should be considered when studying organizational turnover. However, this question can only be answered by conducting the appropriate research.

Levels of Analysis. Future researchers in this area might also want to build a more complete composition model. If the data are available at the individual, group and organizational level, researchers would be able to compare the correlations between similar variables at different levels. In the present study, it would have been interesting to see if there had been a relationship

between satisfaction and turnover at the individual level of analysis. However, the teacher data were collected so that it was impossible to identify the specific teachers within a school.

Summary

In conclusion, additional research should be conducted on organizational turnover. It is an important area of study because turnover may have an effect on so many other organizational processes, such as communication networks and formalization of rules. The present study did confirm that economic conditions, salary, and unionization all play an important role in the turnover process. Results regarding aggregated individual-level variables indicated that these constructs had little influence on organizational-level turnover. Hopefully, additional research in this area will contribute to a better understanding of the organizational turnover process.

APPENDIX A

Principal Items

APPENDIX A

Principal Items

Organizational Size

How many students are enrolled in your school?

Supervisor Turnover

How many principals or headmasters have served your school in the last decade?

0. one
1. two
2. three
3. four
4. five
5. six
6. seven
7. eight
8. nine or more

Average Teacher Salary

What is the average teacher salary in your school this year?

Social Economic Status

How many students in your school receive free or reduced-price lunches?

Organizational Performance

In the tables below, please report standardized achievement test scores for all grades in your school from 6 to 12. Give average percentiles or average normalized curve equivalent scores (NCES).

READING COMPREHENSION

Grade Level	Reading Comp. Score	Type of Score Reported: NCES or percentiles	Test Used, Test Form and Publication Date
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

TOTAL MATH

Grade Level	Reading Comp. Score	Type of Score Reported: NCES or percentiles	Test Used, Test Form and Publication Date
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Orga

Organizational Performance (continued)

TOTAL SCIENCE

Grade Level	Reading Comp. Score	Type of Score Reported: NCES or percentiles	Test Used, Test Form and Publication Date

APPENDIX B

Teacher Items

APPENDIX B

Teacher Items

School Climate

Choose the answer from the following scale that you think most people in your school and community would pick to describe your school. Use this scale for items 71 - 82.

1 = Most people would strongly disagree with this statement.
2 = Most people would disagree with this statement.
3 = Most people would neither agree nor disagree with this statement.
4 = Most people would agree with this statement.
5 = Most people would strongly agree with this statement.
6 = I don't know what most people think about this statement, or I don't know whether this statement fits the school.

Coworker Competence

Teachers are patient and make extra efforts to help students.

Teachers understand and meet the needs of each student.

Students can get help and advice from teachers or counselors.

Most classroom time is spent in learning activities.

Physical Environment

Students and teachers are safe in the school building.

The school is kept neat and attractive.

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School Climate (Continued)

Student Behavior

Students work hard on their studies.

Students are well-behaved.

Students care about and respect each other.

Participation in Decision Making

Use the scale below to answer items 38-41 about your decision making role in the district/school.

4 = Always
3 = Often
2 = Sometimes
1 = Seldom
0 = Never

How frequently do you participate in the decision to hire new staff?

How frequently do you participate in decisions on the promotion of any of the professional staff?

How frequently do you participate in decisions on the adoption of new policies?

How frequently do you participate in the decisions on the adoption of new programs?

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School Climate (Continued)

Degree of Autonomy

Use the scale below to respond to the following statements about practices in your district/school.

3 = Definitely true
2 = true
1 = False
0 = Definitely false

Little action can be taken here until a supervisor approves a decision.

A person who wants to make his/her own decisions would be quickly discouraged here.

Even small matters have to be referred to someone higher up for a final answer.

I have to ask my supervisor before I do almost anything.

Any decision I make has to have my superior's approval.

Teacher Satisfaction

Use the scale below to select the answer that best describes how you feel about the following aspects of your school.

1 = I am very dissatisfied with this aspect of the school.
2 = I am dissatisfied with this aspect of the school.
3 = I am neither satisfied nor dissatisfied with this aspect of the school.
4 = I am satisfied with this aspect of the school.
5 = I am very satisfied with this aspect of the school.
6 = I don't know how I feel about this aspect of the school, or I don't know whether this statement fits my school.

The administrators in your school.

Your pay, fringe benefits, and other compensation.

Your opportunities for career advancement in your school or district.

Student discipline and sense of responsibility.

The school curriculum and your job duties.

The competence, commitment, and level of cooperation of your fellow teachers.

Community and parent support for your school and its programs.

The availability and quality of school facilities, supplies, and maintenance.

The extent and quality of communication about school matters within the school and the district.

APPENDIX C

Average Teacher Salaries for 1987 (by State)

APPENDIX C

Average Teacher Salaries for 1987 by State[1]

State	Average Salary
Alaska	44,000
District of Columbia	33,800
New York	32,600
Michigan	31,500
California	31,200
Rhode Island	31,100
Minnesota	29,100
Connecticut	28,900
New Jersey	28,900
Maryland	28,700
Illinois	28,400
Massachusetts	28,400
Wisconsin	28,200
Wyoming	27,700
Delaware	27,500
Washington	27,500
Colorado	27,400
Pennsylvania	27,400
Hawaii	26,800
Oregon	26,800
United States	26,700
Arizona	26,300
Ohio	26,300
Nevada	26,000
Indiana	25,700
Virginia	25,500
Texas	25,300
Georgia	24,200
New Mexico	24,000
Florida	23,800
North Carolina	23,800
Kansas	23,600
Alabama	23,500
Missouri	23,500

Average Teacher Salaries for 1987 by State (Cont'd)

State	Average Salary
Utah	23,400
Montana	23,200
South Carolina	23,000
Tennessee	22,700
Iowa	22,600
Kentucky	22,600
Nebraska	22,100
Oklahoma	22,100
North Dakota	21,800
Vermont	21,800
Idaho	21,500
New Hampshire	21,400
West Virginia	21,400
Louisiana	21,300
Maine	21,300
Arkansas	20,000
Mississippi	19,600
South Dakota	18,800

1 Information obtained from the Almanac of the 50 States (Hornor, 1989)

APPENDIX D

Professional Unemployment Measure

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APPENDIX D

Unemployment Rate[1] by State[2]

State	Unemployment Rate
Alabama	1.5
Alaska	4.0
Arizona	2.5
Arkansas	2.2
California	2.6
Colorado	2.8
Connecticut	1.5
Delaware	1.0
District of Columbia	3.0
Florida	2.0
Georgia	1.2
Hawaii	1.2
Idaho	3.0
Illinois	2.5
Indiana	1.7
Iowa	1.4
Kansas	1.8
Kentucky	0.6
Louisiana	3.8
Maine	1.2
Maryland	1.6
Massachusetts	1.6
Michigan	2.7
Minnesota	2.1
Mississippi	2.1
Missouri	1.0
Montana	3.6
Nebraska	1.0
Nevada	4.2
New Hampshire	1.7
New Jersey	1.9
New Mexico	1.9
New York	1.7
North Carolina	1.5

Unemployment Rate by State (Cont'd)

State	Unemployment Rate
North Dakota	1.6
Ohio	1.7
Oklahoma	2.3
Oregon	1.4
Pennsylvania	1.9
Rhode Island	1.0
South Carolina	1.0
South Dakota	1.9
Tennessee	2.6
Texas	2.0
Utah	2.3
Vermont	0.7
Virginia	1.6
Washington	3.0
West Virginia	1.6
Wisconsin	2.8
Wyoming	2.0

[1] A value of one in this table represents one thousand people.

[2] Information obtained from the Geographical Profile of Employment and Unemployment, 1987, U. S. Bureau of Labor Statistics, 1989.

APPENDIX E

Teacher Demand Ratings

APPENDIX E

Teacher Demand Ratings

INTRODUCTION

This publication contains the twelfth annual supply/demand report sponsored by the Association for School, College and University Staffing (ASCUS). During the twelve years some reports have been based on surveys of the total ASCUS membership, while others were based upon samples.

This year, for the twelfth annual report, questionnaires were again sent to all ASCUS member teacher placement offices. Five hundred and two questionnaires were mailed in December, 1987, and two hundred and forty-seven (49%) were received in time and in condition to be used in this report.

The basic portion of the survey instrument has remained relatively constant throughout the twelve year period and this report contains material from previous years for comparison purposes.

A special thank you goes to Rosie Ferris of Kansas State University for her dedicated assistance toward the development of this report.

MAP OF REGIONS

AK=Alaska HI=Hawaii 1=North-west 2=West 3=Rocky Mountain 4=Great Plains/Midwest 5=South Central
6=Southeast 7=Great Lakes 8=Middle Atlantic 9=North-east

THE REPORT

SUPPLY/DEMAND

Teacher placement officers continue to report improved job markets for their candidates as compared to previous years. Of the placement officers responding, 57% indicated that the job market has been better or much better for elementary teachers and 58% indicated that it has been better or much better for secondary teachers, as compared to one year earlier. Compared to four years earlier, 76% of the respondents indicated an improved job market at the elementary level and 72% indicated improvement at the secondary level for their candidates.

Fifty-six percent of the respondents indicated that they expected the job market to be improved for this years elementary level graduates and 51% expected improvement for secondary level candidates.

The chart which follows summarizes the improving opportunities for teachers in the United States as described by the responding placement officers.

Question: In general terms how available were employment opportunities for elementary and secondary teachers for the 1987-88 teaching year (last completed placement season) compared to those one year earlier?

%	#	Elementary:	%	#	Secondary:
9	22	much better	15	35	much better
48	116	better	43	100	better
37	88	same	37	87	same
6	14	worse	5	12	worse
0	0	much worse	0	0	much worse
100	240		100	234	

Question: In general terms how available were employment opportunities for elementary and secondary teachers for the 1987-88 teaching year (last completed placement season) compared to those four years earlier (1983-84)?

%	#	Elementary:	%	#	Secondary:
37	80	much better	28	66	much better
39	86	better	44	103	better
14	30	same	17	39	same
9	20	worse	9	21	worse
1	2	much worse	2	5	much worse
100	218		100	234	

Question: In general terms as compared to one year earlier, how do you expect employment opportunities to be for elementary and secondary teachers for the approaching 1988-89 teaching year (current placement season)?

%	#	Elementary:	%	#	Secondary:
8	20	much better	8	18	much better
48	113	better	43	100.5	better
42	99	same	47	110.5	same
2	5	worse	2	4	worse
0	0	much worse	0	0	much worse
100	237		100	233	

TEACHER SUPPLY/DEMAND BY FIELD AND REGION

Region	Alaska	Hawaii	1	2	3	4	5	6
Field								
Agriculture	—	NA	3.00	2.50	2.00	3.08	1.78	3.30
Art	3.00	NA	1.13	1.69	1.93	2.56	2.20	3.48
Bilingual Ed.	3.00	NA	4.00	4.88	4.40	4.17	4.54	4.00
Business	4.00	NA	2.57	2.83	3.08	2.72	2.38	3.13
Computer Science	3.00	NA	3.33	3.18	4.40	3.85	3.71	3.67
Counselor-Elem.	5.00	NA	3.22	2.82	2.80	3.19	3.12	3.48
Counselor-Sec.	5.00	NA	3.33	2.92	2.80	3.04	2.88	3.10
Data Processing	3.00	NA	3.33	4.17	3.50	3.77	3.25	3.31
Driver Ed.	3.00	NA	2.50	2.71	3.00	2.25	2.43	3.00
Elementary-Primary	4.00	NA	2.56	3.28	2.83	2.31	3.61	2.92
Elementary-Intermediate	4.00	NA	2.56	3.22	3.00	2.45	3.56	3.00
English	2.00	NA	2.90	3.42	3.00	3.20	3.50	3.04
Health Education	3.00	NA	1.89	2.23	2.00	1.91	2.00	2.10
Home Economics	5.00	NA	1.75	2.00	2.30	2.04	1.58	2.47
Industrial Arts	3.00	NA	3.20	3.22	2.58	2.61	2.40	3.63
Journalism	3.00	NA	2.67	2.73	2.20	3.13	2.58	3.20
Language, Mod.-French	3.00	NA	3.11	2.88	3.00	3.33	3.73	4.08
Language, Mod.-German	3.00	NA	2.89	2.87	2.42	3.25	3.60	3.90
Language, Mod.-Spanish	3.00	NA	3.33	3.14	3.50	3.53	3.53	3.87
Library Science	3.00	NA	3.17	3.88	3.75	3.33	3.55	3.79
Mathematics	4.00	NA	3.22	4.05	4.00	3.90	4.39	4.19
Music-Instrumental	4.00	NA	3.56	2.87	3.29	3.56	2.35	3.04
Music-Vocal	4.00	NA	3.67	2.60	2.71	3.43	2.41	2.75
Physical Education	3.00	NA	1.13	2.06	1.50	1.29	1.73	1.96
Psychologist (school)	4.00	NA	3.40	3.31	3.20	3.67	3.23	3.42
Science-Biology	3.00	NA	2.78	3.39	2.43	3.30	3.59	3.86
Science-Chemistry	3.00	NA	3.33	4.12	3.57	3.83	4.00	4.25
Science-Earth	3.00	NA	2.78	3.60	3.14	3.43	3.75	3.83
Science-General	3.00	NA	2.78	3.65	3.00	3.02	3.88	3.75
Science-Physics	3.00	NA	3.56	4.19	4.00	3.83	4.50	4.23
Social Sciences	2.00	NA	1.44	1.91	2.07	1.89	2.35	2.12
Social Worker (school)	--	NA	2.17	3.50	2.75	3.19	2.63	2.62
Speech	3.00	NA	2.33	2.80	2.75	2.94	2.73	2.94
Spec.-Deaf Education	5.00	NA	3.20	4.00	4.25	4.24	3.80	3.71
Spec.-ED/PSA	5.00	NA	4.43	4.46	4.25	4.72	4.13	4.18
Spec.-Gifted	5.00	NA	3.83	3.70	3.38	4.04	3.86	3.05
Spec.-LD	5.00	NA	4.38	4.50	4.50	4.41	4.20	4.23
Spec.-MF	5.00	NA	4.38	4.50	4.50	4.23	4.13	4.09
Spec.-Multi Handi	5.00	NA	4.50	4.62	4.50	4.46	4.00	4.27
Spec.-Reading	3.00	NA	3.44	3.75	3.42	3.24	3.87	3.40
Speech Path./Audio.	5.00	NA	3.43	4.00	4.20	4.04	3.69	4.17
COMPOSITE	4.35	NA	2.99	3.31	3.13	3.23	3.29	3.43

Regions are coded as follows: Alaska, Hawaii, 1-Northwest, 2-West, 3-Rocky Mountain, 4-Great Plains/Midwest, 5-South Central, 6-Southeast, 7-Great Lakes, 8-Middle Atlantic, 9-Northeast. Alaska and Hawaii are not included in the Continental United States totals.

ASCUS Supply/Demand
January, 1988

JANUARY, 1988 REPORT

7	8	9	Continental United States							
			1988*	1987	1986*	1985	1984	1982	1976*	
3.00	4.20	3.00	2.88	2.81	3.23	3.11	3.44	4.36	4.06	Ag.
2.38	1.67	2.30	2.35	1.89	2.20	2.04	1.89	1.84	2.14	Art
4.34	4.44	3.50	4.35	4.42	4.27	4.12	4.04	4.13	--	Bil. Ed.
2.92	3.29	3.75	2.90	2.94	3.11	3.32	3.31	3.47	3.10	Bus.
3.74	4.26	4.00	3.79	3.98	4.22	4.37	4.34	--	--	Comp. Sci.
3.19	2.94	2.67	3.12	3.31	3.04	3.05	2.80	2.72	3.15	Couns.-El.
3.29	2.84	2.86	3.03	3.24	3.05	3.08	2.67	2.75	2.69	Couns.-Sec.
3.54	3.85	4.00	3.59	3.31	3.97	4.30	4.18	3.86	--	Data Proc.
2.91	3.11	2.50	2.70	2.67	2.46	2.65	2.61	2.77	2.44	Dr. Ed.
2.38	2.79	3.00	2.71	2.58	2.70	2.57	2.13	2.02	2.78	El.-Prim.
2.40	2.69	2.86	2.72	2.61	2.78	2.53	2.20	2.26	1.90	El.-Inter.
3.11	2.92	2.83	3.11	3.02	3.25	3.14	3.13	3.21	2.05	English
1.80	2.13	2.80	2.02	1.95	1.92	2.08	1.90	1.90	2.27	Health Ed.
2.29	2.82	3.75	2.26	2.16	2.51	2.79	2.43	2.43	2.62	Home Ec.
3.11	3.90	3.33	3.07	3.24	3.30	3.65	3.50	4.36	4.22	Ind. Arts
2.76	3.18	3.00	2.91	3.00	2.93	2.74	2.60	2.61	2.86	Journ.
3.48	3.34	3.25	3.43	3.24	3.34	3.31	3.00	2.49	2.15	French
3.46	3.29	3.40	3.34	3.15	3.26	3.11	3.08	2.48	2.03	German
3.70	3.63	3.56	3.59	3.57	3.64	3.43	3.18	2.68	2.47	Spanish
3.73	3.60	2.33	3.56	3.53	3.39	3.49	3.30	3.12	--	Libr. Sci.
3.80	4.20	4.21	4.00	4.33	4.55	4.71	4.74	4.81	3.86	Math
2.81	2.63	2.78	3.00	3.29	3.14	3.29	3.25	3.28	3.03	Instr.
2.80	2.46	2.78	2.89	3.11	2.95	3.19	3.00	2.95	3.00	Vocal
1.52	2.20	2.13	1.67	1.53	1.60	1.75	1.61	1.72	1.74	P. E.
4.00	3.67	3.20	3.57	3.46	3.43	3.65	2.98	3.56	3.09	Psych.
3.19	3.51	3.67	3.37	3.33	3.65	3.58	3.40	3.66	2.97	Biol.
2.97	3.97	4.09	3.96	4.21	4.40	4.42	4.25	3.13	3.72	Chem.
3.51	3.47	4.00	3.52	3.43	3.86	3.79	3.70	3.89	3.44	Earth
3.46	3.41	3.70	3.42	3.32	3.82	3.65	3.65	--	--	General
4.02	3.85	4.25	4.01	4.26	4.44	4.57	4.45	4.47	4.04	Physics
1.84	2.27	2.56	2.00	2.05	2.11	2.17	1.91	2.11	1.51	Soc. Sci.
3.22	3.50	3.33	3.01	2.82	3.77	2.81	2.33	2.34	--	Soc. Work
2.70	3.69	3.67	2.91	2.86	2.72	2.91	2.70	2.76	2.46	Speech
3.80	4.06	3.50	3.91	3.81	3.72	--	--	--	--	Deaf Ed.
4.22	4.27	4.11	4.33	4.30	4.20	4.02	3.84	3.98	3.42	ED/PSA
3.73	3.90	3.75	3.74	3.88	3.91	3.85	3.74	3.81	3.85	Gifted
4.09	4.17	4.22	4.26	4.46	4.23	3.95	3.98	4.20	4.00	LD
3.85	4.26	4.11	4.15	3.97	4.06	3.76	3.55	3.84	2.87	MR
4.06	4.11	4.13	4.26	3.85	4.25	3.94	3.77	3.93	--	MH
3.30	3.58	3.30	3.43	3.45	3.46	3.39	3.48	3.73	3.96	Reading
4.24	4.00	3.40	4.00	4.21	4.09	4.01	3.83	3.95	3.63	Sp./Aud.
3.21	3.40	3.35	3.28	3.29	3.38	3.36	3.19	3.20	--	COMP.

5 = Considerable Shortage, 4 = Some Shortage, 3 = Balanced, 2 = Some Surplus, 1 = Considerable Surplus

From October, survey of Teacher Placement Officers

James N. Akin
Kansas State University

*Mailings for the 1976, 1986 and 1988 reports included all teacher placement offices which were members of ASCUS.

APPENDIX F

Letter to Principal

APPENDIX F

Letter to Principal

Dear Principal:

In the fall of 1987, your school participated in a project that was developed by researchers at the National Association of Secondary School Principals and Michigan State University. The project examined the relationship between different aspects of the school (such as goals and school climate) and school effectiveness. I was responsible for compiling all of the data we received onto a computer system and analyzing this data.

I am now working on my dissertation and would like to use this data to examine a different problem facing schools today, that of teacher turnover. I am attempting to identify some of the variables that have an effect on the rate of turnover in schools. In order to complete my dissertation, I need some further information from you. There are seven questions on the enclosed form asking about teachers that have left the school and whether or not your teachers are unionized. This task should not take more than five minutes to complete. It would be extremely helpful if you could provide this information to me, and return it to me in the enclosed envelope. You will notice a number at the top of the questionnaire. This identification number was used in the earlier project, and will be used to match your responses on the form to the data your school provided earlier.

Letter to Principal (Cont'd)

When my dissertation is completed, I would be happy to provide you with a summary of my results. Although the summary will not provide specific information on your school, it will provide information on the types of variables that influence teacher turnover based on all of the schools in the sample.

The information that you provide will be treated with strict confidence. You indicate your voluntary agreement to participate in this study by completing and returning this questionnaire. If you have any questions, please contact me at (517) 353-5324 (office) or (517) 882-4623 (home). Thank you very much for your help on this project.

Sincerely,

Mary L. Doherty

Letter to Principal (Continued)

1. What percentage of your teachers belonged to a union during the 1987-1988 school year?

2. How many teacher full-time equivalent (FTEs) voluntarily left your school during or at the conclusion of the 1988-1989 school year (Do not include retirees or those who were asked to leave)?

I would also appreciate your assessment of the teachers' overall skills and abilities. If you would rather not provide these ratings, or feel that you did not know the teachers well enough to rate their skills, I would appreciate it if you would still provide the above information. All information that you provide will be treated confidentially.

3. Out of the teachers who have left, how many of them would you consider to be excellent teachers?

4. Out of the teachers who have left, how many of them would you consider to be better than average teachers?

5. Out of the teachers who have left, how many of them would you consider to be average teachers?

6. Out of the teachers who have left, how many of them would you consider to be below average teachers?

7. Out of the teachers who have left, how many of them would you consider to be poor teachers?

If you would like a copy of the summary of results mentioned earlier, please write your name and address below. Thank you again for your help.

APPENDIX G

Construct Labels associated with Etas and Ksis

APPENDIX G

Construct Labels associated with Etas and Ksis

Eta or Ksi	Construct Label
ETA1	Environmental Climate
ETA2	Degree of Latitude Climate
ETA3	Satisfaction
ETA4	Turnover
KSI1	Organizational Size
KSI2	Union Presence
KSI3	Principal Turnover
KSI4	Teacher Salary
KSI5	Teacher Demand Ratings
KSI6	Professional Unemployment
KSI7	Organizational Performance (Achievement)

APPENDIX H

LISREL Program Used to Evaluate Hypothesized Model

APPENDIX H

LISREL Program Used to Evaluate Hypothesized Model

```
 1  0   INPUT PROGRAM
 2  0   NUMERIC DUMMY
 3  0   END FILE
 4  0   END INPUT PROGRAM
 5  0   USER PROC NAME=LISREL
 6  0   DISSERTATION ANALYSIS
 7  0   DA NI=12 NO=188 MA=KM
 8  0   KM
 9  0   *
10  0   1.00
11  0    .30 1.00
12  0    .65  .33 1.00
13  0   -.06 -.12 -.07 1.00
14  0   -.11 -.03 -.05 -.14 1.00
15  0   -.13 -.13  .01 -.24  .56 1.00
16  0   -.11  .14 -.04 -.27  .03 -.01 1.00
17  0   -.12 -.03 -.15  .11  .07 -.01 -.15 1.00
18  0   -.03  .02  .11 -.20  .01  .32  .29 -.08 1.00
19  0   -.13 -.13 -.18  .05  .10  .23 -.28  .17 -.17 1.00
20  0   -.04 -.03  .07 -.17  .44  .20  .14  .13 -.16  .07 1.00
21  0    .43  .10  .22  .02 -.18 -.18  .04 -.09  .10 -.10 -.24 1.00
22  0   LA
23  0   (12A5)
24  0   CLIM1CLIM2SATISTRATERATIOSTUDSUNIONPRINSTCSALDMANDUNEMPPERFM
25  0   MO NY=4 NX=8 NE=4 NK=7 LX=FI LY=FI BE=FU PH=FI PS=FI TE=FI TD=FI
26  0   PA LY
27  0   (4I1)
28  0   0000
29  0   0000
30  0   0000
31  0   0000
32  0   PA LX
33  0   (7I1)
34  0   0000000
35  0   1000000
36  0   0000000
37  0   0000000
38  0   0000000
39  0   0000000
40  0   0000000
```

```
41  0  0000000
42  0  PA_BE
43  0  (411)
44  0  0000
45  0  0000
46  0  1100
47  0  0010
48  0  PA_GA
49  0  (711)
50  0  1000000
51  0  1000000
52  0  0110000
53  0  0001111
54  0  PA_PH
55  0  (2811)
56  0  00000011000100010000000000000
57  0  PA_PS
58  0  (1011)
59  0  1111010001
60  0  PA_TE
61  0  (411)
62  0  0000
63  0  PA_TD
64  0  (811)
65  0  01011111
66  0  MA_LY
67  0  (4F3.2)
68  0  100.00.00.00
69  0  .00100.00.00
70  0  .00.00100.00
71  0  .00.00.00100
72  0  MA_LX
73  0  (7F3.2)
74  0  100.00.00.00.00.00.00
75  0  .80.00.00.00.00.00.00
76  0  .00100.00.00.00.00.00
77  0  .00.00100.00.00.00.00
78  0  .00.00.00100.00.00.00
79  0  .00.00.00.00100.00.00
80  0  .00.00.00.00.00100.00
81  0  .00.00.00.00.00.00100
```

```
 82   0  MA BE
 83   0  (4F2.1)
 84   0  .0.0.0.0
 85   0  .0.0.0.0
 86   0  .5.5.0.0
 87   0  .0.0.3.0
 88   0  MA GA
 89   0  (7F2.1)
 90   0  .2.0.0.0.0.0.0
 91   0  .2.0.0.0.0.0.0
 92   0  .0.3.2.0.0.0.0
 93   0  .0.0.0.3.1.1.2
 94   0  MA PH

 95   0  (28F2.1)
 96   0  10.010.0.010.2.2.010.0.2.0.010.2.0.0.0.010.0.0.0.0.0.010
 97   0  MA PS
 98   0  (10F2.1)
 99   0  .9.3.9.3.0.8.0.0.0.8
100   0  MA TE
101   0  (4F2.1)
102   0  .0.0.0.0
103   0  MA TD
104   0  (8F3.2)
105   0  .00.10.00.10.10.10.10.10
106   0  OU SE TV RS EF VA MI TM=150
107   0  END USER

There are 1,840,600 bytes of memory available.
The largest contiguous area has 1,840,600 bytes.
```

L I S R E L VI - VERSION 6.13

BY

KARL G JORESKOG AND DAG SORBOM

DISSERTATION ANALYSIS

THE FOLLOWING LISREL CONTROL LINES HAVE BEEN READ :

```
DA NI=12 NO=188 MA=KM
KM
*
1.00
 .30 1.00
 .65  .33 1.00
-.06 -.12 -.07 1.00
-.11 -.03 -.05 -.14 1.00
-.13 -.13  .01 -.24  .56 1.00
-.11  .14 -.04 -.27  .03 -.01 1.00
-.12 -.03 -.15  .11  .07 -.01 -.15 1.00
-.03  .02  .11 -.20  .01  .32  .29 -.08 1.00
-.13 -.13 -.18  .05  .10  .23 -.28  .17 -.17 1.00
-.04 -.03  .07 -.17  .44  .20  .14  .13 -.16  .07 1.00
 .43  .10  .22  .02 -.18 -.18  .04 -.09  .10 -.10 -.24 1.00
LA
(12A5)
MO NY=4 NX=8 NE=4 NK=7 LX=FI LY=FI BE=FU PH=FI PS=FI TE=FI TD=FI
PA LY
(411)
PA LX
(711)
PA BE
(411)
PA GA
(711)
PA PH
(2811)
PA PS
(1011)
PA TE
(411)
PA TD
(811)
MA LY
(4F3.2)
MA LX
(7F3.2)
MA BE
(4F2.1)
```

```
MA GA
(7F2.1)
MA PH
(28F2.1)
MA PS
(10F2.1)
MA TE
(4F2.1)
MA TD
(8F3.2)
OU SE TV RS EF VA MI TM=150
```

L I S R E L VI - VERSION 6.13

DISSERTATION ANALYSIS

NUMBER OF INPUT VARIABLES	12
NUMBER OF Y - VARIABLES	4
NUMBER OF X - VARIABLES	8
NUMBER OF ETA - VARIABLES	4
NUMBER OF KSI - VARIABLES	7
NUMBER OF OBSERVATIONS	188

OUTPUT REQUESTED

TECHNICAL OUTPUT	NO
STANDARD ERRORS	YES
T - VALUES	YES
CORRELATIONS OF ESTIMATES	NO
FITTED MOMENTS	YES
TOTAL EFFECTS	YES
VARIANCES AND COVARIANCES	YES
MODIFICATION INDICES	YES
FACTOR SCORES REGRESSIONS	NO
FIRST ORDER DERIVATIVES	NO
STANDARDIZED SOLUTION	NO
PARAMETER PLOTS	NO
AUTOMATIC MODIFICATION	NO

DISSERTATION ANALYSIS

CORRELATION MATRIX TO BE ANALYZED

	CLIM1	CLIM2	SATIS	TRATE	RATIO	STUDS	UNION	PRINS	TCSAL	DMAND
CLIM1	1.000									
CLIM2	0.300	1.000								
SATIS	0.650	0.330	1.000							
TRATE	-0.060	-0.120	-0.070	1.000						
RATIO	-0.110	-0.030	-0.050	-0.140	1.000					
STUDS	-0.130	-0.130	0.010	-0.240	0.560	1.000				
UNION	-0.110	0.140	-0.040	-0.270	0.030	-0.010	1.000			
PRINS	-0.120	-0.030	-0.150	0.110	0.070	-0.010	-0.150	1.000		
TCSAL	-0.030	0.020	0.110	-0.200	0.010	0.320	0.290	-0.080	1.000	
DMAND	-0.130	-0.130	-0.180	0.050	0.100	0.230	-0.280	0.170	-0.170	1.000
UNEMP	-0.040	-0.030	0.070	-0.170	0.440	0.200	0.140	0.130	-0.160	0.070
PERFM	0.430	0.100	0.220	0.020	-0.180	-0.180	0.040	-0.090	0.100	-0.100

CORRELATION MATRIX TO BE ANALYZED

	UNEMP	PERFM
UNEMP	1.000	
PERFM	-0.240	1.000

DETERMINANT = 0.736321D-01

DISSERTATION ANALYSIS

PARAMETER SPECIFICATIONS

LAMBDA Y

	ETA 1	ETA 2	ETA 3	ETA 4
CLIM1	0	0	0	0
CLIM2	0	0	0	0
SATIS	0	0	0	0
TRATE	0	0	0	0

LAMBDA X

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
RATIO	0	0	0	0	0	0	0
STUDS	1	0	0	0	0	0	0
UNION	0	0	0	0	0	0	0
PRINS	0	0	0	0	0	0	0
TCSAL	0	0	0	0	0	0	0
DMAND	0	0	0	0	0	0	0
UNEMP	0	0	0	0	0	0	0
PERFM	0	0	0	0	0	0	0

BETA

	ETA 1	ETA 2	ETA 3	ETA 4
ETA 1	0	0	0	0
ETA 2	0	0	0	0
ETA 3	2	3	0	0
ETA 4	0	0	4	0

GAMMA

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
ETA 1	5	0	0	0	0	0	0
ETA 2	6	0	0	0	0	0	0
ETA 3	0	7	8	0	0	0	0
ETA 4	0	0	0	9	10	11	12

PHI

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
KSI 1	0						
KSI 2	0	0					
KSI 3	0	0	0				
KSI 4	13	14	0	0			
KSI 5	0	15	0	0	0		
KSI 6	16	0	0	0	0	0	
KSI 7	0	0	0	0	0	0	0

PSI

	ETA 1	ETA 2	ETA 3	ETA 4
ETA 1	17			
ETA 2	18	19		
ETA 3	20	0	21	
ETA 4	0	0	0	22

THETA EPS

CLIM1	CLIM2	SATIS	TRATE
0	0	0	0

THETA DELTA

RATIO	STUDS	UNION	PRINS	TCSAL	DMAND	UNEMP	PERFM
0	23	0	24	25	26	27	28

DISSERTATION ANALYSIS

INITIAL ESTIMATES (TSLS)

LAMBDA Y

	ETA 1	ETA 2	ETA 3	ETA 4
CLIM1	1.000	0.000	0.000	0.000
CLIM2	0.000	1.000	0.000	0.000
SATIS	0.000	0.000	1.000	0.000
TRATE	0.000	0.000	0.000	1.000

LAMBDA X

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
RATIO	1.000	0.000	0.000	0.000	0.000	0.000	0.000
STUDS	0.800	0.000	0.000	0.000	0.000	0.000	0.000
UNION	0.000	1.000	0.000	0.000	0.000	0.000	0.000
PRINS	0.000	0.000	1.000	0.000	0.000	0.000	0.000
TCSAL	0.000	0.000	0.000	1.000	0.000	0.000	0.000
DMAND	0.000	0.000	0.000	0.000	1.000	0.000	0.000
UNEMP	0.000	0.000	0.000	0.000	0.000	1.000	0.000
PERFM	0.000	0.000	0.000	0.000	0.000	0.000	1.000

BETA

	ETA 1	ETA 2	ETA 3	ETA 4
ETA 1	0.000	0.000	0.000	0.000
ETA 2	0.000	0.000	0.000	0.000
ETA 3	0.500	0.500	0.000	0.000
ETA 4	0.000	0.000	0.300	0.000

GAMMA

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
ETA 1	0.200	0.000	0.000	0.000	0.000	0.000	0.000
ETA 2	0.200	0.000	0.000	0.000	0.000	0.000	0.000
ETA 3	0.000	0.300	0.200	0.000	0.000	0.000	0.000
ETA 4	0.000	0.000	0.000	0.300	0.100	0.100	0.200

PHI

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
KSI 1	1.000						
KSI 2	0.000	1.000					
KSI 3	0.000	0.000	1.000				
KSI 4	0.200	0.200	0.000	1.000			
KSI 5	0.000	0.200	0.000	0.000	1.000		
KSI 6	0.200	0.000	0.000	0.000	0.000	1.000	
KSI 7	0.000	0.000	0.000	0.000	0.000	0.000	1.000

PSI

	ETA 1	ETA 2	ETA 3	ETA 4
ETA 1	0.900			
ETA 2	0.300	0.900		
ETA 3	0.300	0.000	0.800	
ETA 4	0.000	0.000	0.000	0.800

THETA EPS

CLIM1	CLIM2	SATIS	TRATE
0.000	0.000	0.000	0.000

THETA DELTA

RATIO	STUDS	UNION	PRINS	TCSAL	DMAND	UNEMP	PEREM
0.000	0.100	0.000	0.100	0.100	0.100	0.100	0.100

SQUARED MULTIPLE CORRELATIONS FOR Y - VARIABLES

CLIM1	CLIM2	SATIS	TRATE
1.000	1.000	1.000	1.000

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

RATIO	STUDS	UNION	PRINS	TCSAL	DMAND	UNEMP	PEREM
1.000	0.900	1.000	0.900	0.900	0.900	0.900	0.900

SQUARED MULTIPLE CORRELATIONS FOR STRUCTURAL EQUATIONS

ETA 1	ETA 2	ETA 3	ETA 4
0.043	0.043	0.572	0.300

TOTAL COEFFICIENT OF DETERMINATION FOR STRUCTURAL EQUATIONS IS 0.337

DISSERTATION ANALYSIS

LISREL ESTIMATES (MAXIMUM LIKELIHOOD)

LAMBDA Y

	ETA 1	ETA 2	ETA 3	ETA 4
CLIM1	1.000	0.000	0.000	0.000
CLIM2	0.000	1.000	0.000	0.000
SATIS	0.000	0.000	1.000	0.000
TRATE	0.000	0.000	0.000	1.000

LAMBDA X

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
RATIO	1.000	0.000	0.000	0.000	0.000	0.000	0.000
STUDS	0.560	0.000	0.000	0.000	0.000	0.000	0.000
UNION	0.000	1.000	0.000	0.000	0.000	0.000	0.000
PRINS	0.000	0.000	1.000	0.000	0.000	0.000	0.000
TCSAL	0.000	0.000	0.000	1.000	0.000	0.000	0.000
DMAND	0.000	0.000	0.000	0.000	1.000	0.000	0.000
UNEMP	0.000	0.000	0.000	0.000	0.000	1.000	0.000
PERFM	0.000	0.000	0.000	0.000	0.000	0.000	1.000

BETA

	ETA 1	ETA 2	ETA 3	ETA 4
ETA 1	0.000	0.000	0.000	0.000
ETA 2	0.000	0.000	0.000	0.000
ETA 3	0.342	0.226	0.000	0.000
ETA 4	0.000	0.000	-0.027	0.000

GAMMA

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
ETA 1	-0.110	0.000	0.000	0.000	0.000	0.000	0.000
ETA 2	-0.030	0.000	0.000	0.000	0.000	0.000	0.000
ETA 3	0.000	-0.008	-0.077	0.000	0.000	0.000	0.000
ETA 4	0.000	0.000	0.000	-0.236	0.021	-0.208	0.001

PHI

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
KSI 1	1.000						
KSI 2	0.000	1.000					
KSI 3	0.000	0.000	1.000				
KSI 4	0.089	0.266	0.000	1.000			
KSI 5	0.000	-0.239	0.000	0.000	1.000		
KSI 6	0.456	0.000	0.000	0.000	0.000	1.000	
KSI 7	0.000	0.000	0.000	0.000	0.000	0.000	1.000

PSI

	ETA 1	ETA 2	ETA 3	ETA 4
ETA 1	0.988			
ETA 2	0.297	0.999		
ETA 3	0.230	0.000	0.610	
ETA 4	0.000	0.000	0.000	0.913

THETA EPS

CLIM1	CLIM2	SATIS	TRATE
0.000	0.000	0.000	0.000

THETA DELTA

RATIO	STUDS	UNION	PRINS	TCSAL	DMAND	UNEMP	PERFM
0.000	0.686	0.000	0.000	0.034	0.003	0.010	0.000

W_A_R_N_I_N_G : THE MATRIX THETA DELTA IS NOT POSITIVE DEFINITE

SQUARED MULTIPLE CORRELATIONS FOR Y - VARIABLES

CLIM1	CLIM2	SATIS	TRATE
1.000	1.000	1.000	1.000

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

RATIO	STUDS	UNION	PRINS	TCSAL	DMAND	UNEMP	PERFM
1.000	0.314	1.000	1.000	0.966	0.997	0.990	1.000

SQUARED MULTIPLE CORRELATIONS FOR STRUCTURAL EQUATIONS

ETA 1	ETA 2	ETA 3	ETA 4
0.012	0.001	0.382	0.099

TOTAL COEFFICIENT OF DETERMINATION FOR STRUCTURAL EQUATIONS IS 0.119

MEASURES OF GOODNESS OF FIT FOR THE WHOLE MODEL :

CHI-SQUARE WITH 50 DEGREES OF FREEDOM IS 199.87 (PROB. LEVEL = 0.000)

GOODNESS OF FIT INDEX IS 0.865

ADJUSTED GOODNESS OF FIT INDEX IS 0.789

ROOT MEAN SQUARE RESIDUAL IS 0.112

DISSERTATION ANALYSIS

MODIFICATION INDICES

LAMBDA Y

	ETA 1	ETA 2	ETA 3	ETA 4
CLIM1	0.000	0.000	2.900	0.140
CLIM2	0.000	0.000	0.106	1.984
SATIS	1.088	2.762	0.000	0.058
TRATE	1.082	2.760	0.000	0.000

LAMBDA X

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
RATIO	0.038	0.144	0.247	22.677	0.224	0.441	0.012
STUDS	0.000	0.196	0.659	26.278	8.226	0.729	1.709
UNION	1.255	0.037	1.663	0.039	0.023	8.421	0.033
PRINS	0.916	4.208	0.000	0.761	4.709	3.776	1.759
TCSAL	8.840	0.140	0.110	7.494	5.778	8.094	2.107
DMAND	2.589	4.695	3.595	5.252	6.836	2.691	1.865
UNEMP	2.658	2.146	3.008	4.258	0.068	0.760	5.480
PERFM	6.054	0.303	1.521	1.792	1.863	10.705	0.000

BETA

	ETA 1	ETA 2	ETA 3	ETA 4
ETA 1	0.000	0.000	2.899	0.156
ETA 2	0.000	0.000	0.107	1.988
ETA 3	0.000	0.000	0.000	0.058
ETA 4	1.082	2.760	0.000	0.000

GAMMA

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
ETA 1	0.000	4.586	2.248	1.371	0.472	0.176	30.747
ETA 2	0.000	6.146	0.007	0.426	2.059	0.012	0.255
ETA 3	0.000	0.000	0.000	5.095	1.984	4.051	0.989
ETA 4	0.635	6.718	2.517	0.000	0.000	0.000	0.000

PHI

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
KSI 1	0.038						
KSI 2	0.067	0.037					
KSI 3	0.061	1.663	0.000				
KSI 4	0.000	0.000	0.519	7.494			
KSI 5	1.394	0.000	3.726	5.778	6.838		
KSI 6	0.000	7.320	2.127	8.094	0.844	0.760	
KSI 7	1.539	0.030	1.515	2.107	1.865	5.480	0.000

PSI

	ETA 1	ETA 2	ETA 3	ETA 4
ETA 1	0.000			
ETA 2	0.000	0.000		
ETA 3	0.000	0.000	0.000	
ETA 4	0.619	1.707	2.841	0.000

THETA EPS

CLIM1	CLIM2	SATIS	TRATE
0.000	0.000	2.836	0.000

THETA DELTA

RATIO	STUDS	UNION	PRINS	TCSAL	DMAND	UNEMP	PERFM
0.272	0.000	0.043	0.000	0.000	0.000	0.000	0.000

MAXIMUM MODIFICATION INDEX IS 30.75 FOR ELEMENT (1, 7) OF GAMMA

DISSERTATION ANALYSIS

STANDARD ERRORS

LAMBDA Y

	ETA 1	ETA 2	ETA 3	ETA 4
CLIM1	0.000	0.000	0.000	0.000
CLIM2	0.000	0.000	0.000	0.000
SATIS	0.000	0.000	0.000	0.000
TRATE	0.000	0.000	0.000	0.000

LAMBDA X

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
RATIO	0.000	0.000	0.000	0.000	0.000	0.000	0.000
STUDS	0.061	0.000	0.000	0.000	0.000	0.000	0.000
UNION	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PRINS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TCSAL	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DMAND	0.000	0.000	0.000	0.000	0.000	0.000	0.000
UNEMP	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PERFM	0.000	0.000	0.000	0.000	0.000	0.000	0.000

BETA

	ETA 1	ETA 2	ETA 3	ETA 4
ETA 1	0.000	0.000	0.000	0.000
ETA 2	0.000	0.000	0.000	0.000
ETA 3	0.565	0.179	0.000	0.000
ETA 4	0.000	0.000	0.070	0.000

GAMMA

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
ETA 1	0.073	0.000	0.000	0.000	0.000	0.000	0.000
ETA 2	0.073	0.000	0.000	0.000	0.000	0.000	0.000
ETA 3	0.000	0.054	0.055	0.000	0.000	0.000	0.000
ETA 4	0.000	0.000	0.000	0.075	0.070	0.073	0.070

PHI

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
KSI 1	0.000						
KSI 2	0.000	0.000					
KSI 3	0.000	0.000	0.000				
KSI 4	0.064	0.070	0.000	0.000			
KSI 5	0.000	0.069	0.000	0.000	0.000		
KSI 6	0.065	0.000	0.000	0.000	0.000	0.000	
KSI 7	0.000	0.000	0.000	0.000	0.000	0.000	0.000

PSI

	ETA 1	ETA 2	ETA 3	ETA 4
ETA 1	0.102			
ETA 2	0.076	0.103		
ETA 3	0.512	0.000	0.268	
ETA 4	0.000	0.000	0.000	0.095

THETA EPS

CLIM1	CLIM2	SATIS	TRATE
0.000	0.000	0.000	0.000

THETA DELTA

RATIO	STUDS	UNION	PRINS	TCSAL	DMAND	UNEMP	PERFM
0.000	0.071	0.000	0.103	0.106	0.104	0.101	0.103

DISSERTATION ANALYSIS

T-VALUES

LAMBDA Y

	ETA 1	ETA 2	ETA 3	ETA 4
CLIM1	0.000	0.000	0.000	0.000
CLIM2	0.000	0.000	0.000	0.000
SATIS	0.000	0.000	0.000	0.000
TRATE	0.000	0.000	0.000	0.000

LAMBDA X

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
RATIO	0.000	0.000	0.000	0.000	0.000	0.000	0.000
STUDS	9.243	0.000	0.000	0.000	0.000	0.000	0.000
UNION	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PRINS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TCSAL	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DMAND	0.000	0.000	0.000	0.000	0.000	0.000	0.000
UNEMP	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PERFM	0.000	0.000	0.000	0.000	0.000	0.000	0.000

BETA

	ETA 1	ETA 2	ETA 3	ETA 4
ETA 1	0.000	0.000	0.000	0.000
ETA 2	0.000	0.000	0.000	0.000
ETA 3	0.605	1.264	0.000	0.000
ETA 4	0.000	0.000	-0.390	0.000

GAMMA

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
ETA 1	-1.513	0.000	0.000	0.000	0.000	0.000	0.000
ETA 2	-0.410	0.000	0.000	0.000	0.000	0.000	0.000
ETA 3	0.000	-0.139	-1.398	0.000	0.000	0.000	0.000
ETA 4	0.000	0.000	0.000	-3.144	0.302	-2.832	0.021

PHI

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
KSI 1	0.000						
KSI 2	0.000	0.000					
KSI 3	0.000	0.000	0.000				
KSI 4	1.391	3.818	0.000	0.000			
KSI 5	0.000	-3.459	0.000	0.000	0.000		
KSI 6	7.010	0.000	0.000	0.000	0.000	0.000	
KSI 7	0.000	0.000	0.000	0.000	0.000	0.000	0.000

PSI

	ETA 1	ETA 2	ETA 3	ETA 4
ETA 1	9.670			
ETA 2	3.913	9.670		
ETA 3	0.450	0.000	2.279	
ETA 4	0.000	0.000	0.000	9.617

THETA EPS

CLIM1	CLIM2	SATIS	TRATE
0.000	0.000	0.000	0.000

THETA DELTA

RATIO	STUDS	UNION	PRINS	TCSAL	DMAND	UNEMP	PEREM
0.000	9.670	0.000	0.000	0.322	0.032	0.100	0.000

DISSERTATION ANALYSIS

FITTED MOMENTS AND RESIDUALS

FITTED MOMENTS

	CLIM1	CLIM2	SATIS	TRATE	RATIO	STUDS	UNION	PRINS	TCSAL	DMAND
CLIM1	1.000									
CLIM2	0.300	1.000								
SATIS	0.640	0.329	0.988							
TRATE	-0.005	-0.006	-0.021	1.013						
RATIO	-0.110	-0.030	-0.044	-0.114	1.000					
STUDS	-0.062	-0.017	-0.025	-0.064	0.560	1.000				
UNION	0.000	0.000	-0.008	-0.068	0.000	0.000	1.000			
PRINS	0.000	0.000	-0.077	0.002	0.000	0.000	0.000	1.000		
TCSAL	-0.010	-0.003	-0.006	-0.236	0.089	0.050	0.266	0.000	1.034	
DMAND	0.000	0.000	0.002	0.021	0.000	0.000	-0.239	0.000	0.000	1.003
UNEMP	-0.050	-0.014	-0.020	-0.207	0.456	0.256	0.000	0.000	0.000	0.000
PERFM	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000

FITTED MOMENTS

	UNEMP	PERFM
UNEMP	1.010	
PERFM	0.000	1.000

FITTED RESIDUALS

	CLIM1	CLIM2	SATIS	TRATE	RATIO	STUDS	UNION	PRINS	TCSAL	DMAND
CLIM1	0.000									
CLIM2	0.000	0.000								
SATIS	0.010	0.001	0.012							
TRATE	-0.055	-0.114	-0.049	-0.013						
RATIO	0.000	0.000	-0.006	-0.026	0.000					
STUDS	-0.068	-0.113	0.035	-0.176	0.000	0.000				
UNION	-0.110	0.140	-0.032	-0.202	0.030	-0.010	0.000			
PRINS	-0.120	-0.030	-0.073	0.108	0.070	-0.010	-0.150	0.000		
TCSAL	-0.020	0.023	0.116	0.036	-0.079	0.270	0.024	-0.080	-0.034	
DMAND	-0.130	-0.130	-0.182	0.029	0.100	0.230	-0.041	0.170	-0.170	-0.003
UNEMP	0.010	-0.016	0.090	0.037	-0.016	-0.056	0.140	0.130	-0.160	0.070
PERFM	0.430	0.100	0.220	0.019	-0.180	-0.180	0.040	-0.090	0.100	-0.100

FITTED RESIDUALS

	UNEMP	PERFM
UNEMP	-0.010	
PERFM	-0.240	0.000

NORMALIZED RESIDUALS

	CLIM1	CLIM2	SATIS	TRATE	RATIO	STUDS	UNION	PRINS	TCSAL	DMAND
CLIM1	0.000									
CLIM2	0.000	0.000								
SATIS	0.116	0.016	0.117							
TRATE	-0.749	-1.555	-0.663	-0.127						
RATIO	0.000	0.000	-0.077	-0.345	0.000					
STUDS	-0.934	-1.548	0.479	-2.385	0.000	0.000				
UNION	-1.504	1.914	-0.446	-2.742	0.410	-0.137	0.000			
PRINS	-1.641	-0.410	-1.005	1.466	0.957	-0.137	-2.051	0.000		
TCSAL	-0.272	0.305	1.568	0.470	-1.054	3.631	0.311	-1.076	-0.319	
DMAND	-1.775	-1.775	-2.497	0.392	1.365	3.140	-0.547	2.321	-2.282	-0.032
UNEMP	0.139	-0.222	1.235	0.491	-0.202	-0.732	1.905	1.769	-2.141	0.951
PERFM	5.880	1.367	3.027	0.252	-2.461	-2.461	0.547	-1.231	1.345	-1.365

NORMALIZED RESIDUALS

	UNEMP	PERFM
UNEMP	-0.097	
PERFM	-3.265	0.000

DISSERTATION ANALYSIS

TOTAL EFFECTS

TOTAL EFFECTS OF KSI ON ETA

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
ETA 1	-0.110	0.000	0.000	0.000	0.000	0.000	0.000
ETA 2	-0.030	0.000	0.000	0.000	0.000	0.000	0.000
ETA 3	-0.044	-0.008	-0.077	0.000	0.000	0.000	0.000
ETA 4	0.001	0.000	0.002	-0.236	0.021	-0.208	0.001

TOTAL EFFECTS OF KSI ON Y

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6	KSI 7
CLIM1	-0.110	0.000	0.000	0.000	0.000	0.000	0.000
CLIM2	-0.030	0.000	0.000	0.000	0.000	0.000	0.000
SATIS	-0.044	-0.008	-0.077	0.000	0.000	0.000	0.000
TRATE	0.001	0.000	0.002	-0.236	0.021	-0.208	0.001

TOTAL EFFECTS OF ETA ON ETA

	ETA 1	ETA 2	ETA 3	ETA 4
ETA 1	0.000	0.000	0.000	0.000
ETA 2	0.000	0.000	0.000	0.000
ETA 3	0.342	0.226	0.000	0.000
ETA 4	-0.009	-0.006	-0.027	0.000

LARGEST EIGENVALUE OF (I-BETA)*(I-BETA)-TRANSPOSED (STABILITY INDEX) IS 0.168

TOTAL EFFECTS OF ETA ON Y

	ETA 1	ETA 2	ETA 3	ETA 4
CLIM1	1.000	0.000	0.000	0.000
CLIM2	0.000	1.000	0.000	0.000
SATIS	0.342	0.226	1.000	0.000
TRATE	-0.009	-0.006	-0.027	1.000

THE PROBLEM REQUIRED 2608 DOUBLE PRECISION WORDS.
THE CPU-TIME WAS 2.94 SECONDS

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