

Relationships between psychological climate perceptions and work outcomes: a meta-analytic review

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Summary

In this study, meta-analytic procedures were used to examine the relationships between individual-level (psychological) climate perceptions and work outcomes such as employee attitudes, psychological well-being, motivation, and performance. Our review of the literature generated 121 independent samples in which climate perceptions were measured and analyzed at the individual level. These studies document considerable confusion regarding the constructs of psychological climate, organizational climate, and organizational culture and reveal a need for researchers to use terminology that is consistent with their level of measurement, theory, and analysis. Our meta-analytic findings indicate that psychological climate, operationalized as individuals' perceptions of their work environment, does have significant relationships with individuals' work attitudes, motivation, and performance. Structural equation modeling analyses of the meta-analytic correlation matrix indicated that the relationships of psychological climate with employee motivation and performance are fully mediated by employees' work attitudes. We also found that the James and James (1989) PC_g model could be extended to predict the impact of work environment perceptions on employee attitudes, motivation, and performance. Despite the number of published individual-level climate studies that we found, there is a need for more research using standardized measures so as to enable analyses of the organizational and contextual factors that might moderate the effects of psychological climate perceptions. Finally, we argue for a molar theory of psychological climate that is rooted in the psychological processes by which individuals make meaning or their work experiences. Copyright © 2003 John Wiley & Sons, Ltd.

Introduction

Beginning with Lewin, Lippitt, and White's (1939) discussion of 'social climates,' employee climate perceptions have received considerable attention in the organizational literature and have been used to predict a variety of important individual and organizational outcome variables. At the individual-level of analysis, researchers have reported relationships between employees' perceptions of their work

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environment and outcomes such as job satisfaction (Schneider & Snyder, 1975), burnout (McIntosh, 1995), job involvement (Brown & Leigh, 1996), organizational citizenship behavior (Moorman, 1991), and job performance (Pritchard & Karasick, 1973). When aggregated to the group or organization level, employee climate perceptions have been used to predict group-level outcomes such as accident rates (Zohar, 2000), customer satisfaction, and financial performance (Schneider & Bowen, 1985; Schneider, White, & Paul, 1998). Based on the assumption that employee perceptions have important effects on both individual and organizational outcomes, the use of climate surveys as a diagnostic tool for organizational improvement and change is widely accepted in applied settings (Burke & Litwin, 1992; Church & Waclawski, 1998; Kraut, 1996; Ricci, Kim, & Quinn, 1998). Despite this continued interest, no quantitative review has been conducted to assess the strength and generalizability of these relationships at either the individual or organizational level of analysis. In this research, we begin to address this gap by using meta-analytic techniques to summarize the relationships between psychological climate perceptions and important individual-level outcomes such as work attitudes (i.e., job satisfaction, job involvement, and organizational commitment), psychological well-being, employee motivation, and performance. In addition, we use structural equation modeling to examine competing theories regarding the effects of psychological climate perceptions on work attitudes, motivation, and performance.

Defining and Distinguishing Psychological Climate from Related Constructs

The absence of quantitative reviews of the psychological climate literature may, in part, be due to uncertainty regarding the boundaries of the construct—a problem that has long plagued this area of research (Rousseau, 1988). Initially, researchers commented that the concept of climate was of little value because of its redundancy with job satisfaction (Guion, 1973; Johannesson, 1973). Subsequent research has since substantiated a distinction between these two constructs, defining climate perceptions as employees' descriptions of their work environment, whereas job satisfaction refers to employees' evaluations of those perceptions (James & Jones, 1974; LaFollette & Sims, 1975; Payne, Fineman, & Wall, 1976; Schneider & Snyder, 1975). The conceptual uncertainty regarding climate perceptions has been perpetuated, however, by researchers' use of a variety of terms (e.g., psychological climate, collective climate, organizational climate, organizational culture) when referring to individuals' perceptions of their work environment. Recent discussions of the meaning of these constructs has helped to remedy this definitional slippage (e.g., Glick, 1985, 1988; James & Jones, 1974; James, Joyce, & Slocum, 1988; Reichers & Schneider, 1990; Rousseau, 1988). Nevertheless, in order to establish boundaries for our review, it is important that we begin by clearly defining psychological climate and distinguishing it from other related constructs. In our opinion, much of the conceptual confusion produced by the use of multiple terms in climate research can be remedied by clearly defining one's level of theory, measurement, and analysis (Klein, Dansereau, & Hall, 1994).

Psychological climate has been conceptualized as a molar construct comprising an individual's psychologically meaningful representations of proximal organizational structures, processes, and events (James, Hater, Gent, & Bruni, 1978; Rousseau, 1988). The roots of the psychological climate construct can be traced to Lewin's (1936) use of the term of 'life space' as a means of explaining individuals' motivational and affective reactions to change. Psychological climate perceptions enable an individual to interpret events, predict possible outcomes, and gauge the appropriateness of their subsequent actions (Jones & James, 1979). Researchers have posited that such representations are an interpretation

of organizational events based on an individual's knowledge structures (James & Sells, 1981) reflecting either personal (James & James, 1989; James, James, & Ashe, 1990) or organizational values (Burke, Borucki, & Hurley, 1992; Kopelman, Brief, & Guzzo, 1990). Furthermore, it is generally accepted that *psychological climate* is a property of the individual and that the individual is the appropriate level of theory, measurement, and analysis (James & Jones, 1974; Reichers & Schneider, 1990; Rousseau, 1988).

Confusion is generated, however, when the terms *collective climate*, *organizational climate*, and *organizational culture* are used to refer to variables that are also analyzed at the individual level. Although collective climate, organizational climate, and organizational culture are often measured by collecting individuals' perceptions of their work environment, these terms should be reserved for research where the appropriate level of theory and analysis is the work group, organization, or some other social collective. That is, collective climate, organizational climate, and organizational culture are all group-level constructs that may be measured by aggregating psychological climate perceptions. In this research, we considered any study that used these terms to describe their variables yet measured and analyzed their data at the individual level to be a study of psychological climate.

Collective climates are statistically generated—via cluster analyses—to empirically produce collections of individuals who share similar psychological climate perceptions (e.g., Joyce & Slocum, 1984). Research continues to explore whether 'collectives climates' represent groups that have any sociopsychological significance or are simply statistical artifacts of the clustering procedures used to generate them (Gonzalez-Roma, Peiro, Lloret, & Zornoza, 1999; Patterson, Payne, & West, 1996; Young & Parker, 1999). Organizational climate and organizational culture, however, refer to characteristics of groups whose composition is determined a priori and may correspond to various levels of aggregation ranging from the work group to the entire organization (Dansereau & Alutto, 1990). Decisions as to the appropriate level of aggregation are typically made on the basis of one's theoretical interests and then justified by demonstrating a sufficient level of within-group agreement (James, Demaree, & Wolf, 1993; Kozlowski & Hattrup, 1992).

Organizational climate may have either a subjective or objective focus (Ekval, 1987; Glick, 1988; James, Joyce, & Slocum, 1988; Rousseau, 1988). From a subjective perspective organizational climate is an aggregated molar construct, reflecting the sense-making processes (Weick, 1995) by which group members' collectively understand and share their experiences of organizational events. Such interpretations are properties of a social collective in that they are inextricably linked to employee interaction processes (Ashforth, 1985; Rentsch, 1990; Schneider & Reichers, 1983; Young & Parker, 1999). From an objective perspective, organizational climate is a property of the organization itself and represents employees' descriptions of an area of strategic focus or organizational functioning such as customer service (Schneider & Bowen, 1985; Schneider, Wheeler, & Cox, 1992; Schneider, White, & Paul, 1998), innovation (Abbey & Dickson, 1983), transfer of training (Noe, 1986; Rouiller & Goldstein, 1993; Tracey, Tannenbaum, & Kavanaugh, 1995), or safety (Zohar, 2000). The objective focus is rooted in Schneider's (1985) admonition that climates must be 'for something.'

In contrast to the descriptive focus of organizational climate, organizational culture has a normative focus that attempts to capture members' values, beliefs, and assumptions as to the appropriate ways to think, act, and behave (Rousseau, 1990; Sackmann, 1991; Schein, 1990). Schein describes organizational climate as one surface-level manifestation of an organization's culture. That is, members' values and prescriptive beliefs become codified into organizational structures, systems, and processes that then guide the collective behaviors that are measured as organizational climate perceptions. Although beyond the scope of this review, the reader is referred to Smircich and Calás (1987) for a useful taxonomy that categorizes the various theoretical and methodological perspectives on organizational culture.

In this meta-analysis, we elected to examine relationships between psychological climate and relevant work outcomes. Therefore, in this study, the individual is the appropriate level of theory,

measurement, and analysis. There are both practical and substantive reasons for focusing on the individual level in beginning a meta-analytic review of the climate literature. First, from a practical standpoint, despite the widespread use of the terms organizational climate and culture, our literature search revealed that the great majority of empirical 'climate' studies consist of variables that were measured and analyzed at the individual level. Second, and more importantly, psychological climate perceptions have been related to a variety of individual-level outcomes that have long been important in studies of organizational behavior, including job satisfaction, organizational commitment, job involvement, employee motivation, psychological well-being, and employee performance. Finally, because the existence of individual-level relationships may be one reason for believing that similar relationships exist at the group and organization levels, accumulating individual-level findings may help to inform theory building at the organizational level.

Categorizing Psychological Climate Dimensions

Unfortunately, although we can provide a generally agreed upon definition of psychological climate, there is still little agreement as to the specific dimensions that comprise the construct. Even a casual survey of the psychological climate literature reveals that a staggering number and variety of dimensions have been measured, easily demonstrating the difficulty in identifying the construct's perimeter. Employees' perceptions of virtually every aspect of their work environment, including the characteristics of their jobs, physical environment, supervision, top management, and co-workers, have been included in psychological climate research. Clearly, if a quantitative review of psychological climate is to provide meaningful results, it is first necessary to find a means of categorizing the enormous number of psychological climate scales into a logical set of core categories. Although one possibility is to simply collapse all of the various measures into one overall climate index, we felt that this approach could dilute the effects of important relationships between specific psychological climate dimensions and other variables. Therefore, we rejected this approach and examined the literature for alternative means of categorizing dimensions of psychological climate.

The choice of an appropriate model to serve as an organizing framework is extremely important and represents one of the significant 'judgment calls' (Wanous, Sullivan, & Malinak, 1989) in conducting this meta-analysis. In this section we highlight three models that have been proposed and review the logic that drives our choice of the model to use in this research. Each of the three models have a common foundation, citing the theoretical and factor analytic work of earlier researchers (e.g., Campbell, Dunnette, Lawler, & Weick, 1970; Litwin & Stringer, 1968; Muchinsky, 1976; Payne & Pugh, 1976; Sims & LaFollette, 1975) as being central to their development. To evaluate the suitability of these models for our purposes, we considered the following criteria: First, does the model provide adequate coverage of the content domain of psychological climate? That is, given our definition of psychological climate as a molar construct representing the meaning that individuals' impute to their work environment, to what extent can the model capture the range of perceptual variables that have been included in prior psychological climate research? Second, does the model facilitate the unambiguous assignment of psychological climate dimensions to specific categories? Third, does the theory underlying the model clearly apply at the individual level? Finally, has subsequent research supported the construct validity of the model through empirical techniques such as confirmatory factor analysis?

We considered three models of psychological climate that have been proposed in the literature. Kopelman, Brief, and Guzzo (1990) suggested that the following five dimensions represent common elements of psychological climate: goal emphasis, means emphasis, reward orientation, task support,

and socioemotional support. Although they make a cogent case for how these specific dimensions can influence employee attitudes and motivation, other dimensions that have been discussed in the literature (e.g., job challenge and autonomy) are not readily integrated into this framework. Alternatively, in her study of the interactions between person and situation factors on individual attitudes and behavior, Ostroff (1993) categorized climate dimensions as affective (related to people involvement), cognitive (related to psychological involvement), or instrumental (related to task involvement) facets of the work environment. We elected not to adopt this model for two reasons: First, Ostroff proposed these categories to represent dimensions that would be aggregated and analyzed at the organizational, not individual, level. Second, we found it difficult to assign other psychological climate dimensions to these categories without presupposing whether their effects would be affective, cognitive, or instrumental. For example, one could make a case that role ambiguity could be placed in either the cognitive or affective category. The third model we considered was proposed by Jones and James (1979) in developing a measure of psychological climate. Their approach uses situational characteristics as referents for specific psychological climate dimensions. Such an approach is appealing in that psychological climate is intended to describe how individuals cognitively represent their work environment. Therefore, it makes sense to organize individuals' perceptions according to situational referents.

In their reviews of past research, James and his colleagues (James & Sells, 1981; Jones & James, 1979) identified five primary domains of work environment perceptions: job characteristics (e.g., autonomy, challenge, and importance), role characteristics (e.g., ambiguity, conflict, and overload), leadership characteristics (e.g., goal emphasis, support, and upward influence), work group and social environment characteristics (e.g., cooperation, pride, and warmth), and organizational and subsystem attributes (e.g., innovation, management awareness, and openness of information). Subsequent research, using confirmatory factor analyses of data from a variety of sources, has generally supported this framework (e.g., James & James, 1989). We should note, however, that James and his colleagues do not currently include the organizational and subsystem category in their models (James et al., 1990; James & McIntyre, 1996). Much of the psychological climate literature, however, is based on individuals' perceptions of organizational attributes (e.g., Burke et al., 1992; Burke & Litwin, 1992; Litwin & Stringer, 1968). As a result, we anticipated that these five situational referents would provide the basis for an objective and comprehensive coding system that could help organize the psychological climate literature.

Effects of Psychological Climate Perceptions

A more substantive issue pertaining to the study of psychological climate is its relationship to important individual-level outcomes. Clear delineation of the form that these relationships take would be an important step toward advancing our knowledge of the effects of psychological climate perceptions. At a general level, psychological climate perceptions are viewed as providing a mediating link between organizational characteristics and individual outcomes such as employee attitudes, motivation, and performance (e.g., Field & Abelson, 1982; James et al., 1977; Lawler, Hall, & Oldham, 1974; Litwin & Stringer, 1968; Payne & Pugh, 1974). Consistent with Lewin's (1936) notion of 'life space,' psychological climate perceptions provide a cognitive representation of one's work environment that enables individuals to impute meaning to organizational events and determine the actions that will lead to desired outcomes. Recently, however, more specific models have been proposed to explain how perceptions of the work environment, work attitudes, and motivation may influence individual behavior. A series of nested models, describing the effects of psychological climate on various outcome variables,

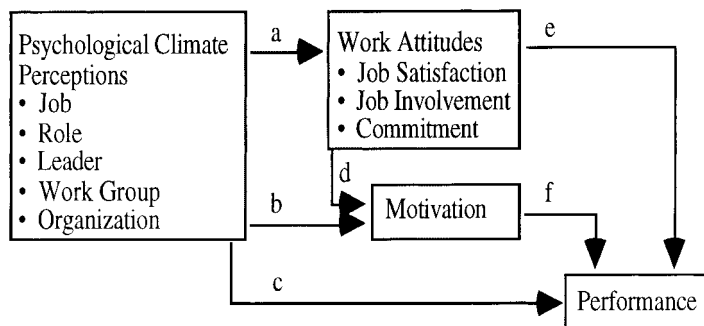


Figure 1. Effects of psychological climate perceptions on work attitudes, motivation, and performance

can be discerned in the literature and are depicted here in Figure 1. The following discussion will describe these models in greater detail.

First, in contrast to a direct effects model, the effects of psychological climate perceptions on performance may be mediated by employee work attitudes and motivation. For example, Kopelman et al. (1990) posited that the relationships between psychological climate and 'salient organizational behaviors' such as performance, citizenship, and attachment (i.e., tenure and attendance) are mediated by cognitive and affective states such as individuals' work motivation, job satisfaction, commitment, and job involvement. Their model is grounded in the notion that people behave in accordance with their beliefs, expectations, and feelings. Perceptions of the work environment evoke outcome expectancies, instrumentalities, and valuations (James et al., 1977; Litwin & Stringer 1968) that have a direct effect on individual motivation in accordance with traditional expectancy-value models (e.g., Rotter, 1954; Vroom, 1964) and more recent self-regulatory approaches to motivation (Kanfer, 1990). Similarly, evaluations based on one's psychological climate perceptions will evoke feelings of satisfaction and identification with one's job and organization (e.g., James, 1982; James et al., 1990). Although they are not the only determinants of performance-related outcomes, positive work attitudes do generally predict absenteeism (Muchinsky, 1977), turnover (Griffith, Hom, & Gaertner, 2000; Hom, Caranikas-Walker, Prussia, & Griffith, 1992), citizenship (Organ, 1988), and performance (Iaffaldano & Muchinsky, 1985; Judge, Thoreson, Bono, & Patton, 2001). Figure 1 can be used to depict this fully mediated model by deleting the direct path from psychological climate to performance (labeled as 'c').

Recent research by Brown and Leigh (1996) suggests further specification of the relationships that mediate the effects of psychological climate on performance. They reported that the effects of psychological climate perceptions on effort and performance were mediated by job involvement. They argued that, because effort is a discretionary resource, individuals will only be motivated to the degree that they identify with their job and organization. We propose to broaden their theory and examine whether perceptions of the work environment are only related to motivation to the extent that they engender feelings of satisfaction, commitment, and involvement. Although this causal ordering is somewhat speculative, it is consistent with theories of both job satisfaction (Katzell, Thompson, & Guzzo, 1992) and organizational commitment (Allen & Meyer, 1997) in which the effects of these variables on performance are at least partially mediated by motivation. This reasoning would suggest that the model in Figure 1 can be further modified by deleting the path between psychological climate and motivation (labeled as 'b'). Then, by deleting the direct paths between work attitudes and performance (labeled as 'e'), we can test whether the relationships between work attitudes and performance are partially or fully mediated by motivation.

Finally, we can further refine our structural model by incorporating the hierarchical models of psychological climate that have recently been proposed (Burke et al., 1992; James & James, 1989). James

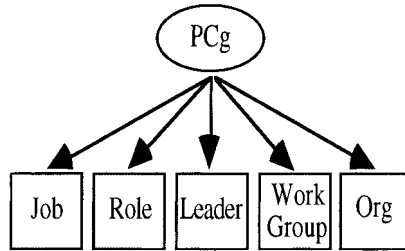


Figure 2. James and James. (1989) hierarchical structure of psychological climate perceptions

and James argued that a common judgment process underlies diverse measures of work environment perceptions. This common judgment process—labeled as PC_g —is hypothesized to represent an assessment of whether the work environment is viewed as personally beneficial or detrimental to one's organizational well-being. Figure 2 depicts this hierarchical structure of psychological climate. In their model, PC_g is proposed as an underlying judgment process that represents the meaning and subsequent impact of psychological climate perceptions (James et al., 1990; James & James, 1992; James & McIntyre, 1996). Although a formal model, relating PC_g to the outcome variables of interest here has not been fully explicated, we can test whether a single higher-order factor (PC_g) is sufficient to model the effects of diverse psychological climate measures. Thus, Figure 2 can be directly substituted into the structural models tested in Figure 1.

Summary and Purpose

This study was undertaken with two primary goals in mind. Our first objective was to address the need for a quantitative review of the relationships between psychological climate and individual-level outcomes. This was accomplished using meta-analytic procedures to generate a correlation matrix among the five psychological climate categories defined by Jones and James (1979) and the outcome variables that have been researched in prior psychological climate studies. Our second goal was to examine alternative structural models that describe the effects of psychological climate perceptions on employee attitudes (such as satisfaction, commitment, and job involvement), motivation, and performance. Here, we used structural equation modeling of the meta-analytically derived correlation matrix (c.f. Hom et al., 1992; Podsakoff, MacKenzie, & Bommer, 1996; Viswesvaran & Ones, 1995).

Organizational Context

Contextual Features of the Studies Included in the Meta-Analysis

The 94 studies that contributed the 121 samples for this meta-analysis were published between the years 1967 and 1999; 39.4 per cent of these between 1990 and 1999, 29.8 per cent between 1980 and 1989, 27.7 per cent between 1970 and 1979, and 3.2 per cent between 1960 and 1969. The

majority of the samples reported data from organizations located within the United States (75 per cent). Other countries and regions represented in the sample included: Europe (primarily France and the U.K., 11 per cent), India (7 per cent), Australia/New Zealand (3 per cent), Canada (2 per cent), and Israel (2 per cent). The samples represent both for-profit (64 per cent) and not-for-profit (36 per cent) organizations. Although organization size was only reported for 23 per cent of the samples, 75 per cent of those providing this information were from organizations with more than 1000 employees. Studies including information about the type of industry sampled could be categorized as follows: industrial manufacturing (20 per cent), health care (16 per cent), financial (13 per cent), governmental (including military and public utilities, 12 per cent), education (primarily university staff, 12 per cent), technology (9 per cent), consumer (primarily retail, 9 per cent), professional services (6 per cent), and transportation (3 per cent). Roughly half of the studies (48 per cent) provided information on the primary occupational categories of the employees or organizational members that were sampled; 19 per cent managerial, 16 per cent professional non-managerial, 10 per cent sales and service, and 3 per cent manufacturing. The remaining 52 per cent of the studies reported that its sample contained either a mixture of occupational categories (31 per cent) or did not provide any occupational information at all (21 per cent).

Method

Identification and selection of studies

The definition of psychological climate as a molar construct that represents individuals' perceptions of their proximal work environment presents a challenge for searching the literature and identifying relevant studies on which to base our meta-analysis. Much of the research in organizational behavior measures perceptual variables (e.g., job characteristics, leader behavior) that could reasonably be construed as dimensions of psychological climate. Furthermore, many dimensions of psychological climate overlap with other areas of organizational research for which meta-analyses have already been conducted. For example, Fried (1991), Fried and Ferris (1987), and Taber and Taylor (1990) each conducted meta-analyses on the relationships between the Job Characteristics Model (Hackman & Oldham, 1975) and outcome variables such as job satisfaction, motivation, and performance. Other meta-analyses have investigated relationships between individual perceptions of work group cohesiveness and individual performance (Evans & Dion, 1991), between leadership style and job satisfaction (Mullen, Symons, Hu, & Salas, 1989), and between role perceptions (e.g., role conflict and ambiguity) and job satisfaction and performance (Abramis, 1994; Jackson & Schuler, 1985). Therefore, in conducting our literature search, we were faced with competing goals: Most importantly, we wanted to include a sufficiently large sample of studies that span a variety of organizations in order to maximize the validity and generalizability of our results. However, we also wanted to limit our sample to a manageable number of studies and minimize the redundancy between our study and other meta-analyses. To balance these objectives and be consistent with the definition of psychological climate as a molar construct, we limited our sample to those climate studies that included a wide range of psychological climate dimensions. More discussion of the specific criteria we used to identify these studies follows below.

The identification of relevant studies to include in this meta-analysis consisted of two steps. First, we searched PsycLIT for studies published prior to December 1999 using the following sets of key words: (1) psychological climate; (2) organizational climate; (3) organizational climate; (4) work climate; (5) employee perceptions; (6) job perceptions; and (7) work environment perceptions. We then read

through the resulting abstracts and eliminated those that were clearly unrelated to organizational research (e.g., those dealing with climatology). Next, we located the remaining sources, and searched their reference sections for additional sources containing any of the above key words in their titles. We then repeated this process with the secondary sources, and continued this cycle until no other references were found. The above process yielded a total of 464 sources.

Our second step was to examine each source to determine if it met the following inclusion criteria: (1) the article was an empirical study that measured and analyzed psychological climate at the individual level of analysis (note that we included studies even if they used the term organizational climate or culture as long as their unit of measurement and analysis was the individual); (2) the psychological climate scores assigned to an individual were obtained from the individual, and not from another source (e.g., assigning a score based on a supervisor's perceptions); (3) study participants rated an actual organization of which they were currently a member; (4) the study did not involve experimental manipulations of psychological climate; (5) the sample size and a zero-order correlation coefficient, or a statistic that can be converted to a correlation coefficient, were reported (in cases where this criterion was not met, we either wrote or e-mailed the authors requesting the necessary data); and (6) the researchers measured two or more psychological climate dimensions, representing at least two of the five psychological climate categories (job characteristics, role characteristics, leader behaviors, work group characteristics, and organization and subsystem characteristics) discussed by Jones and James (1979), or two or more dimensions from their 'organization and subsystem' category. By including studies that measured dimensions in multiple categories of psychological climate we could insure that our sample would be consistent with the definition of psychological climate as a molar construct representing perceptions of the work environment.

After applying these six criteria, our final sample consisted of 94 studies containing 121 independent samples and having a total sample size of $N = 65\,830$. Table 1 provides a summary of the sample characteristics that we coded in reviewing each study. In addition to this information, we also recorded individual correlation coefficients, reliability information (if provided), and sample sizes.

Coding studies

Categorizing psychological climate dimensions

In order to assign individual psychological climate dimensions into the five general psychological climate categories of the Jones and James (1979) model, we first compiled a list of all the dimensions along with their definitions, sample items, and/or other appropriate descriptive information. Next, five of the study authors independently assigned each dimension to one of the five psychological climate categories or an 'other' category, which consisted of dimensions that contained components of more than one psychological climate category. Dimensions assigned to this category often originated from studies using factor analyses of climate surveys as opposed to an a priori factor structure. Initially, the average level of classification agreement for the five raters was 93 per cent. We then discussed the dimensions for which there was not complete agreement until we reached consensus or, failing to achieve consensus, assigned the dimension to the 'other' category.

Categorizing dependent variables

Owing to the variety of outcome measures that have been examined in prior climate research, we also found it necessary to categorize the various dependent variables we encountered. Using a process similar to the one described above, we categorized the dependent variables according to the following categories: (1) job satisfaction (including overall and facet satisfaction measures); (2) other measures commonly regarded as job attitudes (primarily organizational commitment and job involvement); (3) psychological well-being (e.g., burnout, psychological stress, and anxiety); (4) motivation

Table 1. Sample characteristics of the samples included in the meta-analysis

Sample characteristics	<i>k</i> of samples
Anonymity of responses	
Anonymous	50
Non-anonymous	13
Average employee age	
Less than 40 years	22
40+ years	13
Employee type	
Manufacturing/blue-collar	4
Sales/service	12
Managerial	23
Professional, non-managerial	19
Mixed professions	38
Unknown	18
Location of organization	
Domestic	66
Foreign	22
Size of organization	
Less than 1000	7
1000 or more	21
Organizational type	
Profit	47
Non-profit	27
Private	48
Public	36
Overall response rate	
Less than 50%	15
50% or greater	55
Sampling strategy	
Random	30
Non-random	22

Note: Sample characteristics were not available for all studies included in the analyses.

(e.g., intrinsic and extrinsic); and (5) performance (e.g., supervisor or self-ratings, citizenship behaviors, object criteria such as sales volume, and attendance). Initially, there was an average agreement level of 91 per cent among the five coders. Once again, we resolved disagreements by discussing each variable until reaching consensus on its categorization.

Meta-analytic procedures

Our primary goal in analyzing the psychological climate literature was to generate a meta-analytic correlation matrix describing the relationships among the Jones and James (1979) psychological climate categories and the dependent variables. We used the procedures outlined by Hunter and Schmidt (1990), correcting for attenuation and weighting each correlation by its sample size prior to computing population correlation coefficients. In addition, following the procedures used by Tett, Jackson, and Rothstein (1991), our results are based on taking the absolute value of each sample correlation and then correcting for the resulting upward bias in the absolute value correlation coefficient. The meta-analytic correlation matrix was computed in three steps as elaborated below.

First, before combining correlation coefficients, we took the absolute value of each sample correlation and then corrected this result for both upward bias and attenuation of the variance of the sampling distribution. Following the logic used by Tett and his colleagues (Tett et al., 1991) in their

meta-analysis of the relationship between personality and job performance, we deemed it necessary to take the absolute value of each correlation coefficient before attempting to combine correlations within or between samples. Given the necessity of classifying the large number of psychological climate dimensions into a smaller set of categories, it is impossible to combine the correlations of different dimensions within a category without making an assumption about the nature of the relationships between each psychological climate dimension and outcome variable. For example, when combining correlations between leader-related psychological climate dimensions and job satisfaction, should one expect the relationship between initiating structure and job satisfaction to be positive or negative? A long history of leadership theory and research has demonstrated the dependence of the direction of this and other relationships on a myriad of situational factors, including subordinate, task, and organizational characteristics (House, 1971; Kerr & Schriesheim, 1974; Korman, 1966). Similarly, although there is research supporting a fairly consistent positive relationship between job autonomy and job satisfaction (Loher, Noe, Moeller, & Fitzgerald, 1985; Taber & Taylor, 1990), the competing effects of increased job satisfaction and the stress associated with increased responsibility make it difficult to predict whether job autonomy should be positively or negatively related to psychological well-being. Tett et al. (1991) cited similar problems in cases where the sign of the expected relationship between a particular personality dimension and job performance depended on the job being performed. Without specific hypotheses relating individual psychological climate dimensions to each outcome variable, in each context in which the relationship is measured (assuming sufficient contextual information is provided), it is impossible to determine whether a sign change is warranted prior to combining correlation coefficients. Therefore, we decided to follow the Tett et al. approach and estimate rho using the absolute values of the correlation coefficients. However, because taking the absolute value prior to combining correlations produces an upward bias in the average correlation coefficient, Tett et al. recommended applying a correction to each absolute value correlation. The specific procedure for making this correction was debated and later revised (Ones, Mount, Barrick, & Hunter, 1994; Tett, Jackson, Rothstein, & Reddon, 1994); we adopted this revised approach (see Ones et al. 1994).

Second, because many of the samples measured multiple psychological climate dimensions or multiple dependent variables that we classified into a single category, it was often necessary to collapse multiple within-sample correlations to represent a single cell of the matrix for a given study. For example, if a study reported correlations between work group cooperation, work group pride, and two measures of job performance, we averaged the four absolute value correlation coefficients to represent the relationship between the work group psychological climate category and job performance for that study. At this step we computed average absolute value correlations that were both corrected and uncorrected for the measures' reliability. If no reliability information was provided, we adopted a conservative approach and used a reliability estimate of 1.0.

Third, after computing the two sets of within-sample correlations (corrected and uncorrected for reliability), we then combined correlations across studies. For each cell in the matrix, correlations were computed by taking the sample-weighted average of the within-sample correlation coefficients. This procedure generated two correlation matrices—one corrected for unreliability and one uncorrected for unreliability.

Structural equation modeling analyses

To execute our second objective and test whether the effects of psychological climate perceptions on performance are mediated by employees' work attitudes, we conducted path analyses using the approach outlined by Viswesvaran and Ones (1995). Our analyses were conducted in LISREL8 using the corrected (for reliability) absolute value correlation matrix and maximum likelihood estimation. Given the variability in sample sizes associated with each correlation coefficient in the meta-analytic

correlation matrix, we adopted Viswesvaran and Ones' recommendation and used the harmonic mean of the sample sizes comprising each entry of the correlation matrix ($N = 2607$). Because we were unable to generate correlations between psychological well-being with both motivation and performance from the studies in our sample (i.e., no studies measured these variables together), we were forced to drop psychological well-being from our analyses. In addition, we dropped the 'other' category of psychological climate, so as not to affect our results with a category that would be difficult to interpret. Constructs were treated as single-item indicators in specifying our structural models. Lastly, in all of our analyses, employee work attitudes were treated as a block and simply allowed to inter-correlate. To evaluate the fit of alternative models we examined the $\Delta\chi^2$, Bentler's (1990) comparative fit index (CFI), and the nonnormed fit index (TLI; Tucker & Lewis, 1973). The $\Delta\chi^2$, due to its dependency on sample size, is likely to reveal statistical differences in models that are the same from a practical standpoint. As a result, we adopted Widaman's (1985) suggestion and used a 0.01 difference in the CFI and TLI as our threshold for detecting different models.

Results

A meta-analytic correlation matrix showing the relationships between each of the climate categories and each of the outcome variables is presented in Table 2. Each entry in the matrix contains: a sample-weighted, average absolute value correlation coefficient (corrected for reliability in the lower half, uncorrected for reliability in the upper half), the standard deviation of these estimates, the number of samples included in each weighted average (k), the total sample size for each correlation (N), and the number of zero-order correlations needed to render the reported correlation non-significant (FD). This last statistic (FD) attempts to quantify the extent to which a 'file drawer' problem could account for the results we report by providing the number of additional studies with correlations of zero that would be required to render each correlation non-significant (Orwin, 1983; Rosenthal, 1979). To examine whether the correlations were homogeneous across studies we used Schmidt and Hunter's (1977) 75 per cent rule. Standard deviations marked with a dagger symbol (†) indicate relationships where moderator variables may be present.

We should note that, because each sample did not include all variables of interest, the median number of samples contributing to each meta-analytic correlation (12) was far fewer than the total number of samples (121). For two of the relationships in the correlation matrix, relating psychological well-being to motivation and performance, we found no samples (given the parameters of our literature search) that included both variables. For the remaining cells, the average total N size per relationship was 6128. This compares favorably with a recent meta-analysis which examined the relationships in Kerr and Jermier's (1978) substitutes for leadership theory and had an average N size of 4080 (Podsakoff et al., 1996).

Table 2 reveals several interesting trends in the data. First, as one might expect, the psychological climate categories are all moderately intercorrelated with each other (average absolute value correlations of 0.328 and 0.295, corrected and uncorrected for scale reliabilities, respectively). More importantly, it is clear that individuals' psychological climate perceptions have significant relationships with their job satisfaction, work attitudes, psychological well-being, motivation, and performance. Each of the psychological climate categories suggests a somewhat different pattern of relationships with the various outcomes, however. In general, employees' job and role perceptions appear to have the weakest relationships with all of the outcome variables. Interestingly, leader, work group, and organizational perceptions are most predictive of employees' work attitudes. A similar pattern is evident for the

Table 2. Summary of meta-analysis results for correlations between psychological climate categories, work attitudes, psychological well-being, motivation, and performance

	1	2	3	4	5	6	7	8	9	10	11
Psychological climate											
1. Role	—	0.155	0.219	0.257	0.291	0.251	0.223	0.171	0.216	0.068	0.050
SD		0.079	0.143	0.088	0.123	0.196	0.166	0.132	0.142	0.056	0.054
<i>k</i>		13	6	15	18	6	19	12	7	3	10
<i>N</i>		2997	1075	5021	5465	2318	5331	2762	1254	349	2391
FD		43	30	149	188	32	168	44	36	—	3
2. Job	0.231	—	0.229	0.205	0.132	0.284	0.179	0.213	0.319	0.145	0.083
SD	0.098		0.172	0.157	0.136	0.176	0.141	0.092	0.275	0.107	0.066
<i>k</i>	13		13	21	27	10	25	18	11	8	12
<i>N</i>	2997		2882	13891	16770	2196	17194	5725	2168	1675	2705
FD	73		70	243	210	60	279	133	77	16	15
3. Leader	0.265	0.279	—	0.415	0.355	0.162	0.362	0.269	0.393	0.187	0.142
SD	0.177†	0.212†		0.208	0.192	0.234	0.165	0.174	0.240	0.189	0.162
<i>k</i>	6	13		16	30	15	24	12	3	7	13
<i>N</i>	1075	2882		11465	24897	20995	5420	3734	7814	1365	2715
FD	39	90		383	887	167	326	92	76	26	59
4. Work group	0.353	0.233	0.478	—	0.577	0.235	0.421	0.228	0.220	0.180	0.110
SD	0.116	0.207†	0.238†		0.152	0.185	0.174	0.183	0.290	0.210	0.149
<i>k</i>	15	21	16		30	11	25	19	9	9	16
<i>N</i>	5021	13891	11465		18140	4062	15015	4463	8393	1615	2678
FD	219	280	459		1426	75	749	132	99	35	30
5. Organization	0.394	0.160	0.373	0.623	—	0.342	0.365	0.310	0.258	0.196	0.115
SD	0.158†	0.173†	0.227	0.179†		0.205	0.161	0.161	0.239	0.206	0.123
<i>k</i>	18	27	30	30		21	47	25	10	8	25
<i>N</i>	5464	16770	24897	18140		23258	21608	7228	1966	1497	5795
FD	272	262	940	1623		573	1335	329	50	23	116
6. Other	0.312	0.337	0.168	0.288	0.356	—	0.349	0.245	0.153	0.068	0.179
SD	0.235	0.215	0.257†	0.201†	0.229†		0.208	0.122	0.103	0.009	0.157
<i>k</i>	6	10	15	11	21		32	13	6	2	10
<i>N</i>	2318	2196	20995	4062	23258		6212	2764	2764	497	2670
FD	42	75	173	96	600		446	75	6	—	38

Continues

Table 2. Continued

Outcome variables												
7. Job satisfaction												
SD	0.284	0.216	0.408	0.482	0.420	0.404	—	0.371	0.416	0.256	0.228	
<i>k</i>	0.211 [†]	0.176 [†]	0.188 [†]	0.207 [†]	0.183 [†]	0.236 [†]		0.298	0.224	0.246	0.222	
<i>N</i>	19	25	24	25	47	32		13	5	5	12	
FD	5331	17194	5420	15015	21608	6212		3468	1387	883	3059	
8. Other job attitudes												
SD	0.216	0.263	0.318	0.269	0.355	0.266	0.412	—	0.315	0.277	0.145	
<i>k</i>	0.159 [†]	0.110	0.190	0.194	0.179 [†]	0.116	0.295		0.049	0.214	0.199	
<i>N</i>	12	18	12	19	25	13	13		2	6	6	
FD	2762	5725	3734	4463	7228	2764	3468		495	1006	678	
9. Psychological well-being												
SD	0.262	0.354	0.438	0.253	0.287	0.179	0.468	0.463	—	—	—	
<i>k</i>	0.142 [†]	0.280	0.267	0.290	0.236	0.119	0.296	0.021				
<i>N</i>	7	11	3	9	10	6	5	2				
FD	1254	2168	7814	8393	1966	721	1387	495				
10. Motivation												
SD	0.094	0.195	0.206	0.200	0.218	0.071	0.292	0.353	—	—	0.134	
<i>k</i>	0.086	0.162 [†]	0.192	0.228	0.202	0.019	0.243	0.177			0.191	
<i>N</i>	3	8	7	9	8	2	5	6			6	
FD	349	1675	1365	1615	1497	497	883	1007			724	
11. Performance												
SD	0.055	0.101	0.157	0.122	0.126	0.203	0.266	0.153	—	0.139	—	
<i>k</i>	0.054	0.081	0.163 [†]	0.149 [†]	0.130 [†]	0.165 [†]	0.240	0.198		0.190		
<i>N</i>	10	12	13	16	25	10	12	6		6		
FD	2391	2705	2715	2678	5795	2670	3059	678		724		
	4	20	68	36	131	44	81			6		

Notes: Entries above the diagonal are weighted average correlation values, uncorrected for reliability. Corrected correlations (for reliability) are below the diagonal. Underlined correlations are not reliably different from zero ($p > 0.05$, two-tailed). *k*, number of samples. FD refers to the number of samples needed to render a correlation non-significant. †Schmidt and Hunter's (1977) 75% rule indicates that moderators may be present.

Table 3. Results of SEM analyses testing relationships of psychological climate with work attitudes, motivation, and performance

Model	χ^2	d.f.	$\Delta\chi^2$	CFI	TLI
PC _g model (correlated factors)	382.04	21	—	0.930	0.880
Partial mediation (Figure 1)	382.04	21	—	0.930	0.880
No mediation (fix a, b)	1392.15	23	1010.11**	0.734	0.583
No mediation (fix d, e, f)	672.15	26	290.11**	0.874	0.826
Full mediation of climate on performance (fix c)	382.05	22	0.01	0.930	0.885
Full mediation of climate on motivation (fix b, c)	393.45	23	14.41	0.928	0.887
Full mediation of work attitudes on performance (fix b, c, e)	548.23	25	166.19**	0.898	0.853
Null model	2518.39	31	3146.46**	0.516	0.438

Notes: $N = 2607$. All $\Delta\chi^2$ values are computed relative to the partial mediation model. CFI, comparative fit index; TLI, Tucker-Lewis index (non-normed fit index). Restricted paths refer to Figure 1.

* $p < 0.05$; ** $p < 0.01$.

relationships of psychological climate with employee motivation and performance. For psychological well-being, however, job and leader perceptions provide the strongest relationships. Overall, it appears that employees' psychological climate perceptions have stronger relationships with their work attitudes than with their motivation and performance. This pattern of relationships suggests that the effects of psychological climate on motivation and performance may be mediated by employees' work attitudes.

To examine the effects of psychological climate perceptions on employee work attitudes, motivation, and performance, a series of nested structural models were estimated and compared. In the first of these models, we tested whether the James and James (1989) PC_g model could account for the correlations among the five psychological climate factors and describe the relationship of work environment perceptions with employee work attitudes, motivation, and performance. To specify the PC_g model, each of the psychological climate factors was allowed to load on a single latent factor (PC_g) as depicted in Figure 2. PC_g was allowed to correlate with each of the remaining constructs in the model. The reader should note that this model provides a more stringent test of the James and James hypothesis in that PC_g must not only model the intercorrelations among climate factors but also model the relationships between individual psychological climate categories and work outcomes. As shown in Table 3, the PC_g model fit the data reasonably well as indicated by both the CFI and TLI. Path coefficients, relating PC_g to each psychological climate factor, were all reliably different from zero and ranged from 0.33 for the job factor to 0.80 for the work group factor. Thus, consistent with James and James (1989), PC_g appears to explain a reasonable proportion of the covariance among psychological climate factors. More importantly, these data indicate that PC_g may be used to model the effects of psychological climate perceptions on work attitudes, motivation, and performance.

In order to determine whether the relationship between PC_g and employee performance is mediated by employee work attitudes and motivation, a series of models derived from Figure 1 were estimated. As elaborated below, these analyses were conducted in keeping with existing multiple regression strategies used to test for mediation (e.g., Baron & Kenny, 1986; James & Brett, 1984). Figure 1 depicts a model in which the effects of psychological climate on motivation and performance are partially mediated by employee work attitudes (job satisfaction, job involvement, and organizational

commitment). Note that the partial mediation model replaces correlations among PC_g , work attitudes, motivation, and performance with an equivalent number of directional paths, resulting in a model that has the same degrees of freedom and an equivalent fit to the PC_g model.

To test whether the relationships between PC_g and performance are at least partially mediated by work attitudes and motivation two models were estimated. In the first of these models, the paths from PC_g to work attitudes and motivation (labeled as a and b in Figure 1) were deleted. In the second, paths from work attitudes and motivation to performance (d, e, and f in Figure 1) were deleted. As shown in Table 3, both of these models fit much worse than the partial mediation model. These results indicate that the effects of psychological climate on performance are at least partially mediated by work attitudes and motivation. To determine whether work attitudes and motivation partially or fully mediate this relationship, the direct path between psychological climate (PC_g) and performance (labeled as 'c' in Figure 1) was deleted. When compared with the partially mediated model, the fully mediated model produced essentially no decrement in fit as judged by the $\Delta\chi^2$, CFI, and TLI. Thus, we can conclude that the effects of psychological climate perceptions on performance are fully mediated by employee work attitudes and motivation.

Next, we attempted to clarify the relationships among psychological climate, work attitudes, and motivation. First, to determine whether the effects of psychological climate on motivation are partially or fully mediated by work attitudes, the direct climate to motivation path (labeled as 'b' in Figure 1) was deleted. When compared with the partial mediation model, this model produced only a non-significant decrement in χ^2 and essentially no change in either the CFI or TLI. Second, to determine whether the effects of work attitudes are partially or fully mediated by employee motivation the direct paths from work attitudes to performance (labeled as 'e' in Figure 1) were deleted. The $\Delta\chi^2$ of this model was much larger (548.23) and there was a substantial drop in both the CFI and TLI. This result suggests that the effects of work attitudes on performance are only partially mediated by employee motivation. Standardized estimates for the final model are presented in Figure 3.

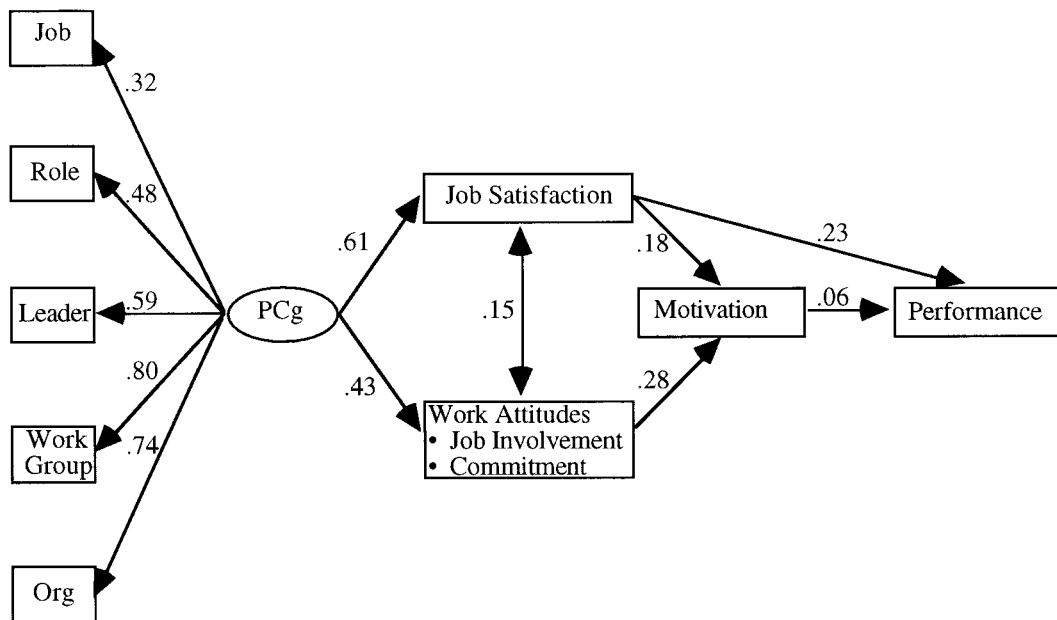


Figure 3. Standardized estimates in final structural model relating psychological climate to work outcomes. All estimates are reliably different from zero ($p < 0.05$)

Discussion

Although there have been numerous theoretical and qualitative reviews of the climate literature (e.g., Ekval, 1987; Field & Abelson, 1982; James & Sells, 1981; Rousseau, 1988), no study has attempted to summarize the quantitative findings present in the large body of empirical research. By using meta-analytic techniques to summarize relationships between psychological climate perceptions and individual-level outcomes, this study represents a first step toward that goal. In addition, we used structural equation modeling to test alternative models describing the relationships between employee psychological climate perceptions, work attitudes, motivation, and employee performance. In discussing our results, we will first review the meta-analytic findings and compare them with the results of other meta-analyses that have focused on related perceptual measures of the work environment. Next, we will discuss the results of our SEM analyses and their implications for understanding the relationships between psychological climate and work outcomes. Finally, we will provide our assessment of the 'state of construct' of psychological climate along with our suggestions for future research.

The meta-analytic results clearly indicate that psychological climate perceptions do have reliable relationships with employees' work attitudes, psychological well-being, motivation, and performance. Generally, psychological climate perceptions have stronger relationships with employees' work attitudes (satisfaction, commitment, and job involvement) and their psychological well-being than with employees' motivation and performance. This pattern of correlations, as elaborated below in our discussion of the SEM analyses, suggests that the effects of psychological climate on employee motivation and performance are mediated by employee work attitudes. Furthermore, the psychological climate dimensions related to employees' leader, work group, and organization were found to have the strongest relationships with their work attitudes, whereas perceptions related to one's job and leader had the strongest effects on their psychological well-being. The studies on which these results are based represent organizations from a variety of industries and employees from a variety of occupational groups. In interpreting these results, however, the reader should keep in mind that the vast majority of the countries represented in the studies included in our sample could be described as having individualistic cultures (Hofstede, 1980). In more collectivistic cultures one might speculate that the psychological climate perceptions related to one's work group and organization may have an even stronger effect on work attitudes and psychological well-being than was found in this research. Unfortunately, because collectivistic cultures are poorly represented in our analyses, we can only speculate on the importance of this variable as a moderator of the relationships we report here and would encourage additional research in this area.

Because the psychological climate construct overlaps with many of the perceptual variables used in prior organizational research, it is also worthwhile to examine these results in light of previous meta-analyses that have focused on similar perceptual dimensions. In general, it appears that the relationships we have found are somewhat lower than those found by previous studies that have focused on a narrow set of variables. For example, we find that role-related psychological climate dimensions have a sample-weighted average absolute value correlation of 0.26 with work attitudes and psychological well-being, whereas Jackson and Schuler (1985) found that the average correlation between role ambiguity and role conflict with job satisfaction, commitment, and job involvement was 0.41. Similarly, Fried (1991) reported that correlations of job characteristics with satisfaction ranged from 0.32 to 0.71, whereas we find a 0.24 average absolute value correlation between job-related psychological climate perceptions and work attitudes.

There are a number of explanations that could account for these differences. One possibility lies in the types of corrections that we used to estimate population correlation coefficients. In particular, the correction for the upward bias associated with taking the absolute value of each sample correlation

(Ones et al., 1994; Tett et al., 1994) may be overly conservative. Although our correlations have been corrected for unreliability, the differences we found could also result from other corrections used by various meta-analytic procedures. For example, we did not correct for range restriction. Similarly, as pointed out by Wanous, Sullivan, and Malinak (1989), there are other judgment calls in meta-analysis related to selecting studies, combining variables, and combining effect sizes within studies that could account for these differences. Lastly, it is also possible that, due to the widespread use of ad hoc measures in the psychological climate literature, instrumentation differences could be important. Because researchers targeting only a few specific constructs (e.g., role conflict and ambiguity or job characteristics) tend to use widely accepted scales, the differences we find may be reflective of results obtained with measures having relatively lower construct validities. Despite all of these differences, however, at a qualitative level our results are consistent with those of more focused meta-analyses.

Turning to the results of our structural equation modeling analyses, we found that the effects of psychological climate perceptions on performance are fully mediated by work attitudes and employee motivation. This result suggests that employees' motivational and behavioral reactions to perceptions of their work environment are mediated by their overall evaluations of these perceptions. In addition, there is evidence that a general climate factor (PC_g), consistent with the James and James (1989) hierarchical model of climate, can account for the effects of psychological climate perceptions on work outcomes. In this research we estimated the relationship between PC_g and satisfaction to be 0.61, which is similar to the values reported by James and James (0.73 to 0.88) across their four samples. More importantly, by examining the relationships between PC_g and other work attitudes (i.e., job involvement and organizational commitment) and incorporating these constructs into a more complete model describing individuals' reactions to their work environment, our results provide an important extension of their research.

Taken together, the meta-analytic results and the subsequent SEM analyses that test alternative models of the relationship of psychological climate with individual outcomes have a number of implications for practitioners assessing psychological climate. Given that our results represent samples drawn from different occupational groups, industries, and national settings, we can be reasonably confident that the effects of psychological climate on individual outcomes are widely generalizable. This should be comforting news to those practitioners who regularly use psychological climate surveys as a part of their efforts to diagnose and improve organizational performance. Furthermore, the fact that psychological climate exhibits strong relations to employee work attitudes and psychological well-being suggests that psychological climate assessments should be a part of interventions that attempt to improve the quality of work life or reduce employee turnover (Hom et al., 1992).

There are limitations to the SEM analyses conducted in this study, however. One should keep in mind that support for a general psychological climate factor (PC_g) underlying perceptions of the work environment may be an artifact of common method variance (see Parker, 1999) and that these results do not discount this possibility. More importantly, the fact that nearly all of the constructs included in this research are based on self-report data (with the exception of just a few studies including measures of supervisor-rated performance) suggests that common method variance could inflate the relationships we report here. We should also note that, although our use of structural equation modeling to examine a meta-analytic correlation matrix is based on the suggestions of Viswesvaran and Ones (1995), there may be limitations to this approach as well. For example, the fact that no one study contained all variables that we included in our analyses could be problematic. And, although Viswesvaran and Ones defended the use of correlations compiled from multiple sources as a way of estimating population correlations and examining complex theoretical models, one must not forget that these data are entirely correlational and causal interpretations should be made cautiously. To remedy these problems, future research should examine the causal models that we test here using time series data. Lastly, there may be unmeasured variables that could affect our results. In particular, it is entirely

possible that objective organizational characteristics, such as the amount of centralization and formalization, could have direct effects on motivation and performance that change the magnitude of the relationships we report here.

There are also limitations to this study that relate to the scope of our literature search and the possibility that important contextual moderators may be involved in the relationships we examined. Due to the number of studies our initial literature search uncovered, we felt that it was important to limit the scope of our research. In particular, we did not specifically attempt to include climate-related dissertations. We did find, however, that a number of the published articles were based on dissertations. In addition, future research could consider the role of setting and other moderator variables, such as those related to the organization's geographic location and size or employees' level in the organizational hierarchy and their occupational group. Such analyses will only be possible, however, if researchers begin to regularly include this type of information when describing their samples.

Our choice of the Jones and James (1979) categorization scheme, which is based on situational referents (job, role, leader, work group, and organization), is also likely to have affected our results. It is possible that classifying psychological climate dimensions according to an alternative taxonomy may result in a different pattern of relationships. Although there are no widely accepted alternatives to the use of situational referents, recent research by James and his colleagues suggests some interesting possibilities (James et al., 1990; James & McIntyre, 1996). In particular, they have expanded the definition of psychological climate perceptions to encompass more than simply veridical descriptions of the work environment. They suggest that a central component of individual psychological climate perceptions is a valuation of the work environment according to value- or need-based judgment processes. This suggests that considering the relationships of specific psychological climate dimensions to individual values or needs may produce a more appropriate taxonomy for summarizing the existing climate research. Similarly, in Dawis and Loftquist's (1984) theory of work adjustment, work-related outcomes such as satisfaction, intent to quit, and tenure result from the correspondence of individuals' needs and values with one's experiences on the job. Accordingly, one might expect that individuals' values and needs would guide their perceptions of their work environment. Therefore, a value- or need-based classification scheme may provide a more psychologically meaningful foundation for examining the effects of psychological climate perceptions on other outcomes such as work attitudes, psychological well-being, motivation, and performance.

Overall, this study represents a first step toward summarizing the empirical literature related to psychological climate. Despite the fact that researchers have been studying employee climate perceptions for more than four decades, this study is the first attempt to provide a quantitative review of this literature. Interestingly, for each of the four decades covered by this review, the number of psychological climate studies included in our analysis has increased. Although this trend is surely biased by the difficulty in obtaining data from older studies, it does indicate that research on psychological climate is certainly not passé. Future research should consider including variables for which we were either unable to estimate relationships or had a small number of samples. In particular, we would encourage researchers to include measures of psychological well-being, employee motivation, and performance in the psychological climate studies they may be planning. In addition, researchers could consider measuring organizational characteristics that may moderate the effects of psychological climate on individual level outcomes.

Two issues we encountered in this literature that posed difficulties for our review have also, in our opinion, hindered the theoretical development of the psychological climate construct. First, this literature has used terminology that routinely confuses levels of theory, measurement, and analysis. Fortunately, we believe there is less confusion surrounding the terms psychological climate, organizational climate, collective climates, and organizational culture in more recent research. We would encourage future researchers to continue this trend, however, and reserve the terms psychological and

organizational climate for research where the unit of theory and analysis is clearly the individual and group, respectively. Of course, organizational climate perceptions might be measured by assessing individuals' perceptions but these should be aggregated to the group or organization level in subsequent analyses.

Second, there is no accepted model of psychological climate that defines the theoretical boundaries of this construct (cf. Rousseau, 1988). From a methodological standpoint, this has hindered the development of standard measures of psychological climate and made it difficult to compile empirical findings. More importantly, the lack of an accepted model has also hindered development of a nomological network relating psychological climate perceptions to other constructs. The results of this research clearly support the proposition that psychological climate perceptions have important relationships with employee work attitudes, well-being, motivation, and performance. But one might argue that the construct of psychological climate is little more than an umbrella term for various work environment perceptions and that to understand their effects we must resort to more specific theory related to job characteristics, leadership, etc. In our opinion, however, there is value in conceptualizing psychological climate as a molar construct that represents the meaning people derive from their work experiences.

In maintaining a molar perspective, a theory of psychological climate is forced to consider and identify the psychological processes by which individuals make meaning of the events they experience in the workplace. For example, do individuals organize their perceptions according to objective features of their work environment or according to more psychologically meaningful constructs such as their values or needs? A molar theory of psychological climate also provides an individual basis for sense-making activities at higher levels of aggregation. At a minimum such a theory would help to identify the roles of individual personality factors (such as one's needs or values), social factors (such as interaction type and frequency) and organizational factors (such as group norms and organizational culture) as determinants of psychological climate perceptions. Such a model would surely help inform our understanding of organizational phenomena where individuals struggle to make sense of their environment such as newcomer socialization and organizational change. Similarly, one might expect that clarifying the origins of psychological climate perceptions would help to clarify the specific mechanisms by which perceptions of the work environment influence individual outcomes.

In conclusion, our results demonstrate that the construct of psychological climate is alive and well—both in terms of the amount of research attention it garners as well as the fact the psychological climate perceptions do influence important individual-level outcomes. Nevertheless, there is clearly a need for additional theoretical development and methodological development of the psychological climate construct. We hope that the results of this study will encourage additional research into how individuals make sense of and react to their work environments.

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*Denotes the studies that were included in the meta-analysis.

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